Regional Development Assessment Panel Agenda

Meeting Date and Time: Tuesday, 16 September 2025; 9.30am
Meeting Number: RDAP/54
Meeting Venue: 140 William Street, Perth

A live stream will be available at the time of the meeting, via the following link:
RDAP/54 - 16 September 2025 - Shire of Three Springs

PART A – INTRODUCTION

1. Opening of Meeting, Welcome and Acknowledgement
2. Apologies
3. Members on Leave of Absence
4. Noting of Minutes

PART B – SHIRE OF THREE SPRINGS

1. Declarations of Due Consideration
2. Disclosure of Interests
3. Form 1 DAP Applications
   - 3.1 Lot 10896 Turkey Flat Road, Kadathinni – Proposed renewable energy facility (solar farm, battery energy storage system & substation – DAP/25/02930
4. Form 2 DAP Applications
5. Section 31 SAT Reconsiderations

PART C – OTHER BUSINESS

1. State Administrative Tribunal Applications and Supreme Court Appeals
2. Meeting Closure

Please note, presentations for each item will be invited prior to the items noted on the agenda and the presentation details will be contained within the related information documentation

ATTENDANCE	
Specialist DAP Members	*DAP Secretariat*
Francesca Lefante (Presiding Member) Eugene Koltasz (Deputy Presiding Member) Neema Premji	Ashlee Kelly Kristen Parker
Part B – Shire of Three Springs	
Cr Chris Connaughton (Local Government DAP Member, Shire of Three Springs)	

PART A – INTRODUCTION

1. **Opening of Meeting, Welcome and Acknowledgement**
2. **Apologies**
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PART B – SHIRE OF THREE SPRINGS

1. Declarations of Due Consideration

2. Disclosure of Interests

3. Form 1 DAP Applications

3.1 Lot 10896 Turkey Flat Road, Kadathinni – Proposed renewable energy facility (solar farm, battery energy storage system & substation – DAP/25/02930

4. Form 2 DAP Applications

Nil

5. Section 31 SAT Reconsiderations

Nil

PART B – ITEM 3.1 - LOT 10896 TURKEY FLAT ROAD, KADATHINNI – PROPOSED RENEWABLE ENERGY FACILITY (SOLAR FARM, BATTERY ENERGY STORAGE SYSTEM & SUBSTATION)

Form 1 – Responsible Authority Report
(Regulation 12)

DAP Name:	Regional DAP	
Local Government Area:	Shire of Three Springs	
Applicant:	SLR for Trina Solar (Australia) Pty Ltd	
Owner:	Extension Hill Pty Ltd	
Value of Development:	$700 million ☒ Mandatory (Regulation 5) ☐ Opt In (Regulation 6)	
Responsible Authority:	Shire of Three Springs	
Authorising Officer:	Simon Lancaster	
LG Reference:	A740	
DAP File No:	DAP/25/02930	
Application Received Date:	1 July 2025	
Report Due Date:	16 September 2025	
Application Statutory Process Timeframe:	90 Days	
Attachment(s):	1. Application 2. Received Submissions 3. Schedule of Submissions	
Is the Responsible Authority Recommendation the same as the Officer Recommendation?	☒ Yes ☐ N/A	Complete Responsible Authority Recommendation section
	☐ No	Complete Responsible Authority and Officer Recommendation sections

Responsible Authority Recommendation

That the Regional DAP resolve to**:**

Approve DAP Application reference DAP/25/02930 and accompanying plans (as contained in Attachment 1 - Application Report dated 4 June 2025) in accordance with Clause 68 of Schedule 2 (Deemed Provisions) of the *Planning and Development (Local Planning Schemes) Regulations 2015* and the provisions of the Shire of Three Springs Local Planning Scheme No.2 subject to the following:

Conditions

1. This decision constitutes planning approval only and is valid for a period of 5 years from the date of approval. If the subject development is not substantially commenced within the 5 year period, the approval shall lapse and be of no further effect.

2. The development shall be undertaken in accordance with the stamped approved plans and supporting documents (Noise Assessment prepared by SLR dated 7/8/25, Traffic Impact Assessment prepared by SLR dated 1/4/25, Visual Impact Assessment prepared by SLR dated 11/4/25, Flora & Fauna Assessment prepared by SLR dated 1/4/25, Bushfire Management Plan prepared by Linfire dated 27/3/25, Bushfire Risk Management Plan prepared by Linfire dated 27/3/25) including any amendments and additional plans and information arising from the approval conditions.

3. Prior to the commencement of development, a Landscape Plan shall be submitted to the local government for approval.

4. Prior to the commencement of the use the landowner shall implement and thereafter maintain for the lifetime of the development the recommendations of the approved Landscape Plan to the satisfaction of the local government.

5. Prior to the commencement of the development a Construction Management Plan shall be submitted to the local government for approval and approved prior to commencement of works.

6. The development shall be completed in accordance with the approved Construction Management Plan to the satisfaction of the local government.

7. Prior to commencement of the development a Stormwater Management Plan shall be submitted to the local government for approval.

8. Prior to the commencement of the use the landowner shall implement and thereafter maintain for the lifetime of the development the recommendations of the approved Stormwater Management Plan to the satisfaction of the local government.

9. Prior to commencement of the development an updated Bushfire Management Plan and Bushfire Risk Management Plan shall be submitted to the local government for approval on advice of the Department of Fire and Emergency Services.

10. Prior to the commencement of the use the landowner shall implement and thereafter maintain for the lifetime of the development the recommendations of the approved Bushfire Management Plan to the satisfaction of the local government.

11. The design, location, installation and maintenance of on-site wastewater/effluent systems is to be to the approval of the local government and in accordance with relevant legislative requirements.

12. The upgrading of the Eneabba-Three Springs Road and Turkey Flat Road intersection to the satisfaction of the local government.

13. Prior to the commencement of the use all vehicle access point(s) onto the local road network, car parking areas and internal vehicle accessways shall be constructed to the satisfaction of the local government.

14. The installation of any directional/traffic/warning/safety signage in the vicinity of the development's access point onto the road network, and relating to the development, shall be to the satisfaction of the local government.

15. All parking of vehicles associated with the development shall be provided for within the property boundary and not the road reserve.

16. The applicant shall be responsible for the upgrade, repair, reinstatement or replacement of any road infrastructure that is damaged, becomes unsafe or fails to meet appropriate engineering standards where the damage to the road network is caused by reason of use of the road in connection with the approved development, to the satisfaction of the local government (or where agreed to by the local government the applicant may instead arrange payment to the local government for such repair, reinstatement or replacement works to be undertaken).

17. Prior to the commencement of operations, an Operational Management Plan shall be submitted to the local government for approval, which includes the establishment of a complaints register to record any complaints that may be received and process for undertaking any mitigating actions that may be required.

18. The measures included in the approved Operational Management Plan shall be implemented to the satisfaction of the local government.

19. Prior to the commencement of works associated with the approved development or the issue of a Building Permit (whichever occurs first), the Noise Assessment shall be reviewed and submitted to, and approved by the Shire of Three Springs, in consultation with the Department of Water and Environmental Regulation.

20. Prior to commencement of operations a Preliminary Decommissioning Plan shall be submitted to the local government for approval.

21. The applicant is required to give at least 3 months' notice to the local government if the proposed development is to cease operations and all infrastructure must be decommissioned and removed from the site. The site must be demonstrated to be free of contaminants and the site rehabilitated through deep ripping/earthworks, and other measures as included in the approved Final Decommissioning Plan to the satisfaction of the local government, within 2 years of giving this notice, unless the local government agrees otherwise.

Advice Notes

(a) The applicant is advised that granting of development approval does not constitute a building permit and that an application for relevant building permits must be submitted to the local government and be approved before any work requiring a building permit can commence on site.

(b) The applicant is advised that the proposed works are near an area of high risk. It is recommended that persons planning to build or undertake works in high risk areas near transmission or communication assets act in a safe manner at all times and in accordance with all applicable legal and safety requirements (including the 'duty of care' under the laws of negligence, Worksafe requirements and guidelines, Australian Standards and Western Power policies and procedures).

(c) Prior to any ground disturbance of the site, all contractors and operators should be made aware of the obligations under the *Aboriginal Heritage Act 1972* relating to site discovery and reporting protocols. This includes stopping work and seeking the advice of both the Registrar of Aboriginal Sites and Yamatji South Regional Corporation (YSRC) in the event that materials of Aboriginal heritage value are discovered during construction activities.

(d) The applicant is advised that this planning approval does not negate the requirement for any additional approvals, and adherence to due diligence, which may be required under separate legislation. This including, but not limited to, the obtaining of any required approvals from the Department of Health, the Department of Mines, Petroleum & Exploration, the Department of Local Government, Industry Regulation & Safety, the Department of Water & Environment Regulation and Main Roads WA and consulting of Before You Dig Australia. It is the applicant's responsibility to obtain any additional approvals, and undertaking of due diligence, required before the development/use lawfully commences.

(e) The applicant will need to consult with the Main Roads WA Heavy Vehicle Services branch to ascertain any approval requirements that may be required for their proposed heavy vehicle combinations, transport routes and operations.

(f) In relation to conditions 3 & 4 the Landscape Plan shall address the mitigation measures as outlined in the Visual Impact Assessment.

(g) In relation to conditions 5 & 6 the Construction Management Plan shall address the following associated with the construction of the development or any other matters considered relevant by the local government.
   i) hours of construction;
   ii) heritage management protocols to mitigate potential risks linked to the exposure of Aboriginal artefacts during ground-disturbing activities;
   iii) temporary fencing, hoardings, gantries, and signage;
   iv) site access and egress;
   v) construction vehicle route and traffic management;
   vi) size and frequency of construction vehicles;
   vii) road upgrades/repairs and timing of works associated with the construction of the development;
   viii) parking arrangements for staff and contractors;
   ix) deliveries and storage of construction materials and machinery;
   x) management of vibration, dust, wind, and erosion;
   xi) management of any stormwater discharge;
   xii) management of construction noise and other site generated noise;
   xiii) demolition and construction waste management, recycling, and removal;
   xiv) protection of any public realm infrastructure;
   xv) public communication and complaint handling procedures;
   xvi) biosecurity protocols.

(h) The Shire is unable to provide guarantee of all-weather access on its unsealed road network, and in the event that the applicant requires all-weather access to its site, the applicant is required to seal the road network to the local government's satisfaction to connect into the existing sealed road network.

(i) In relation to conditions 9 & 10 the Bushfire Management Plan and Bushfire Risk Management Plan shall address the issues raised by the Department of Fire & Emergency Services and any other matters considered relevant by the local government.

(j) In relation to condition 11 the applicant is advised that approval from the Department of Health is required for any on-site wastewater/effluent treatment processes.

(k) In relation to condition 12 the Eneabba-Three Springs Road/Turkey Flat Road intersection shall be upgraded with Basic Right Turn (BAR) and Basic Left Turn (BAL) treatments to improve road safety, and Turkey Flat Road is to be sealed for a distance of 50m south of the Eneabba-Three Springs Road intersection to minimise the migration of gravel from Turkey Flat Road onto Eneabba-Three Springs Road.

(l) The applicant is responsible to ensure that biosecurity protocols are maintained for the site to minimise biosecurity risks for the landowner, adjoining farms and along the transport route and should further information be required on appropriate practices the applicant should contact the Department of Primary Industries & Regional Development in this regard.

(m) The applicant shall enter into a contribution agreement towards community, social or other infrastructure/programs that will benefit the local community. The agreement should establish the process by which the contributions should be directed to the Shire of Three Springs Medical Community Benefit Scheme or other local groups/ventures deemed appropriate. The agreement should give due regard for best available practice including the Draft Western Australia Guidelines on Community Benefits for Renewable Energy Projects and the contribution value per megawatt ($/MW) formula benchmark of the New South Wales Benefit Sharing Guideline.

(n) In relation to condition 19 the reviewed Environmental Noise Assessment shall include:
   (i) Assessed noise levels for all nearby sensitive receivers.
   (ii) Background noise levels.
   (iii) Operating noise levels of equipment selected for installation.
   (iv) Assessment of noise levels for worst-case scenario of night-time at 100% capacity operation.
   (v) Recommended measures to reduce noise level exceedances.

   Any recommended measures to reduce noise level exceedances identified in the approved reviewed Noise Assessment shall be implemented to the satisfaction of the Shire of Three Springs, in consultation with the Department of Water and Environmental Regulation, prior to the operation of the approved development.

(o) Should the applicant be aggrieved by this determination there is a right (pursuant to the *Planning and Development Act 2005*) to have the decision reviewed by the State Administrative Tribunal. Such application must be lodged within 28 days from the date of determination.

Details: outline of development application

Region Scheme	N/A
Region Scheme - Zone/Reserve	N/A
Local Planning Scheme	Shire of Three Springs Local Planning Scheme No.2
Local Planning Scheme - Zone/Reserve	Rural
Structure Plan/Precinct Plan	N/A
Structure Plan/Precinct Plan - Land Use Designation	N/A
Use Class and permissibility:	Renewable Energy Facility (A)
Lot Size:	1,405.2042ha
Existing Land Use:	Agriculture-Extensive
State Heritage Register	No
Local Heritage	☒ N/A ☐ Heritage List ☐ Heritage Area
Design Review	☒ N/A ☐ Local Design Review Panel ☐ State Design Review Panel ☐ Other
Bushfire Prone Area	Yes
Swan River Trust Area	No

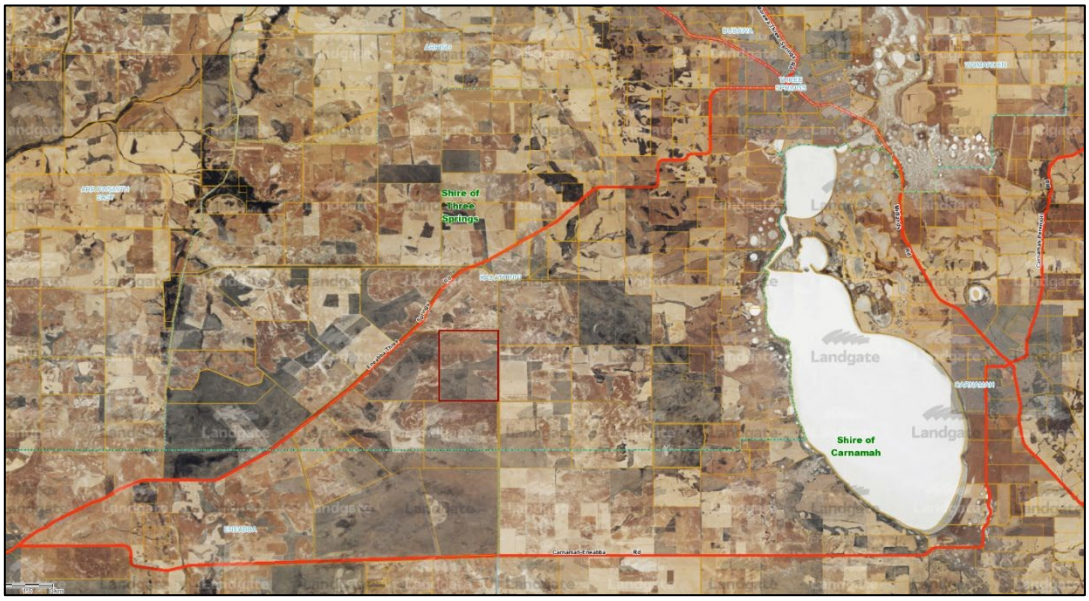
Proposal:

The applicant is seeking development approval for a Renewable Energy Facility comprising a Solar Farm, Battery Energy Storage System (BESS) and Substation upon Lot 10896 Turkey Flat Road, Kadathinni.

Background:

Lot 10896 is 22km south-west of the Three Springs townsite and is a 1,405.2042ha property on the western side of the unsealed Turkey Flat Road and approximately 5km south of its intersection with the sealed Eneabba-Three Springs Road.

Figure 1 – Location Plan for Lot 10896 Turkey Flat Road, Kadathinni



Lot 10896 is relatively flat, with the northern and southern boundaries at the 290m contour, and sloping downwards towards the centre of the property to the 270m contour.

The northern half of Lot 10896 is largely cleared and used for farming purposes and the southern half contains remnant vegetation.

The 330kV transmission line between Perth and Three Springs runs diagonally across the northern cleared section of Lot 10896.

The landowner of Lot 10896 (Extension Hill Pty Ltd) also owns the 1,264.7346ha Lot 10897 located immediately to the north.

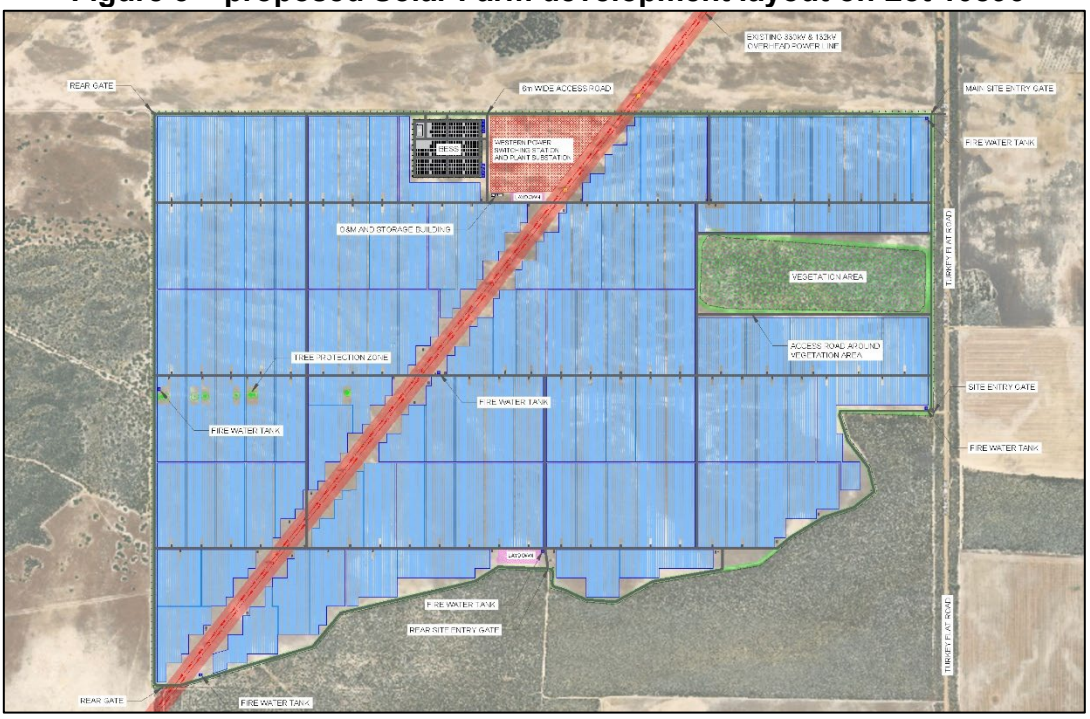
Figure 2 – Aerial Photo of Lot 10896 Turkey Flat Road, Kadathinni



The application proposes to develop the following:

- solar panel array covering approximately 600ha in the in the northern cleared section of the 1,405ha Lot 10896, generating up to 400MW. The solar farm would consist of approximately 680,000 x 5.683m² panels mounted on trackers at a clearance height of 1.5m above ground level, meaning this would be the solar panel array height when laid flat and increasing to approximately 2.4m in height when tilted to 60°;
- BESS covering approximately 6.7ha at the very northern end of the development with a 1.6GW storage capacity. The BESS compound would consist of 504 x 18.315m² BESS containers which have an overall height of 2.896m above ground level and a 1,200m² storage/workshop building;
- substation covering approximately 11.5ha at the northern end of the property, and located immediately east of the BESS and alongside the 330kV transmission line and including a 154.516m² switch room raised 1.901m above ground level making for a total height of 6.019m above ground level, and lightning masts that would be 20m high;
- 146.732m² single storey administration building south of the substation to house offices, toilets, meeting room, lunch room, server room and other rooms;
- 180m² maintenance and storage zincalume clad shed with a height of 8.049m;
- 6 water tank locations sited around the 620ha solar farm and 11 water tanks sited around the BESS and the administration buildings and sheds;
- main entry gate onto Turkey Flat Road on the site's eastern boundary and a secondary access point to the south;
- internal 6m wide gravel access road network and 10m clearance perimeter around the solar farm and 20m Asset Bushfire Protection Zone around development components.

Figure 3 – proposed Solar Farm development layout on Lot 10896



The application is provided as **Attachment 1** and includes the following:

- Application Report;
- Technical Drawings;
- Engagement Report ;
- Noise Assessment Report;
- Traffic Impact Assessment;
- Visual Impact Assessment;
- Flora & Fauna Assessment;
- Bushfire Management Plan & Bushfire Risk Plan.

Figure 4 – proposed Solar Farm site looking north-west



Legislation and Policy:

Legislation

Planning and Development Act 2005
Planning and Development (Development Assessment Panel) Regulations 2011
Planning and Development (Local Planning Schemes) Regulations 2011
Shire of Three Springs Local Planning Scheme No.2

The proposed solar farm development meets with the land use definition of 'Renewable Energy Facility' which is classified in the Shire's Scheme as an 'A' use within the 'Rural' zone which:
"means that the use is not permitted unless the local government has exercised its discretion by granting development approval after giving notice in accordance with clause 64 of the deemed provisions."

'Renewable Energy Facility' is defined under the Scheme as follows:
"means premises used to generate energy from a renewable energy source and includes any building or other structure used in, or in connection with, the generation of energy by a renewable resource. It does not include solar panels or a wind turbine located on a lot with a single house where the energy produced only supplies that house or private rural use or anemometers."

State Government Policies

WAPC Position Statement: Renewable Energy Facilities
Position statement renewable energy facilities (www.wa.gov.au)
Draft Guideline of Community Benefits for Renewable Energy Projects
https://www.wa.gov.au/media/152630/download?inline
State Planning Policy 2.5 – Land Use Planning in Rural Areas
State Planning Policy 3.7 – Planning in Bushfire Prone Areas.

Structure Plans/Activity Centre Plans

Not applicable

Local Policies

Shire of Three Springs Strategic Community Plan 2018-2028
Three Springs Community Strategic Plan
Outcomes 1.1.1, 1.3.1, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 4.2.4

Consultation:

Public Consultation

The application was advertised in accordance with the requirements of Clause 64 of the Regulations. The advertising period ran from 18 July 2025 until 1 August 2025 with the Shire of Three Springs undertaking the following actions:

- copy of the application being placed on the Shire website;
- notice placed in the Mid West Times on 17 July 2025;
- correspondence inviting comment being sent to the 10 landowners within 5km of Lot 10986;

- correspondence inviting comment being sent to the following 18 government agencies and service authorities:
  - ATCO Gas
  - Australian Gas Infrastructure Group
  - Department of Biosecurity, Conservation & Attractions
  - Department of Fire & Emergency Services
  - Department of Health
  - Department of Jobs, Tourism, Science & Innovation
  - Department of Local Government, Industry Regulation & Safety
  - Department of Mines, Petroleum & Exploration
  - Department of Planning, Lands & Heritage
  - Department of Primary Industries & Regional Development
  - Department of Water & Environment Regulation
  - Horizon Power
  - Main Roads WA
  - Mid West Development Commission
  - Synergy Energy
  - Telstra
  - Water Corporation
  - Western Power
- display of the application at the Shire office.

The Shire received 12 submissions, all of them from government agencies either offering no objection or technical comment, no submissions were received from neighbouring landowners. Copies of the received submissions have been provided as **Attachment 2**.

A Schedule of Submissions that summarises the received submissions, and provides individual comment upon the raised issues, has been provided as **Attachment 3**.

The applicant was also provided with a copy of the received submissions and their responses to the raised issues have also been included within the Schedule of Submissions provided as **Attachment 3**.

It also noted that prior to lodging their application the applicant conducted a stakeholder engagement program that included letter drops, newspaper and community notices, targeted meetings and a community information session. Further information in this regard is included in the Engagement Summary Report (Appendix C) of the application which is provided as **Attachment 1**.

Referrals/consultation with Government/Service Agencies

Refer previous section.

Design Review Panel Advice

Not applicable.

Planning Assessment:

Assessment of the development and the received submissions identified the following key issues.

Construction & Traffic

The most significant traffic impact of the development will be during the 15-18 month construction phase when an estimated 13,907 and 13,907 outbound trips would be made (45 return trips per day).

The Traffic Impact Statement is Appendix E within the application provided as **Attachment 1**.

The Statement notes that the most common vehicle configuration in the construction phase would be 20m long articulated vehicles (or smaller vehicles) to transport the solar panels.

27.5m long B-Double design vehicles would be anticipated to be used for the transportation of the BESS batteries, which weigh approximately 35 tonnes.

The largest proposed vehicle movements during construction would be for the transformer and switch room transportation. The Statement notes that a class RAV 1 Oversize & Over Mass permit would need to be obtained from Main Roads WA for the proposed 4 transformers' transportation to site. It is anticipated that the design vehicle for the transformer transportation will have the following geometric features:

- approximate 53m trailer;
- 5 prime movers in a 3-2 push-pull formation and the suspension beam trailer;
- approx. total length of 108m (noting prime movers can be decoupled at intersections).

Large construction vehicles would have 60 km/hr speed restriction on Turkey Flat Road.

Given the scale of Lot 10896 there is ability to ensure that no vehicle parking is conducted outside of the property boundary (i.e. within the road reserve).

The application advises that construction works will only be carried out between 7:00am and 7:00pm on any day other than a Sunday or public holiday.

It is anticipated that a maximum of 240 workers and 10 supervisors will travel to the site via buses and light vehicles at the peak of construction activities. On a typical day during the construction phase it is anticipated there would likely be fewer workers on site. Post-construction, it is anticipated that the maximum on-site workforce will be 5 persons.

The applicant notes that:

> *"The TIA identifies that the intersections which serve the subject site will continue operating satisfactorily during the construction of the project. Intersection performance analysis was undertaken at four study intersections and concluded that the road network, in its existing form, will accommodate the traffic impacts of the proposed project.*
> - *It is recommended that the Eneabba-Three Springs Road/ Turkey Flat Road intersection be upgraded with Basic Right Turn (BAR) and Basic Left Turn (BAL) treatments to improve road safety.*
> - *In addition (although not a strictly necessary), one design vehicle's length (27.5m) should be sealed on Turkey Flat Road at the Eneabba-Three Springs Road intersection (southeast leg of the intersection) to*

minimise and mitigate the migration of gravel from Turkey Flat Road onto Eneabba-Three Springs Road.

- *It is expected that a construction traffic management plan (CTMP) and road dilapidation reports will be required as conditions of approval.*
- *Once the development becomes operational, the traffic on Turkey Flat Road is expected to return to light levels as the development will be unstaffed."*

The recommendation of this report includes applying a condition of approval requiring that the applicant submit a Construction Management Plan for Shire approval and that this plan include traffic management and road upgrade details.

It is also recommended that upgrades to the Turkey Flat Road and Eneabba-Three Springs Road intersection be undertaken to address road safety.

Figure 5 – View looking west, north and east at Turkey Flat Road and Eneabba-Three Springs Road intersection



Noise

The Noise Assessment Report is Appendix F in the application provided as **Attachment 1**. The Assessment models that the proposed development would comply with the *Environmental Protection (Noise) Regulations 1997* as measured from surrounding noise sensitive premises.

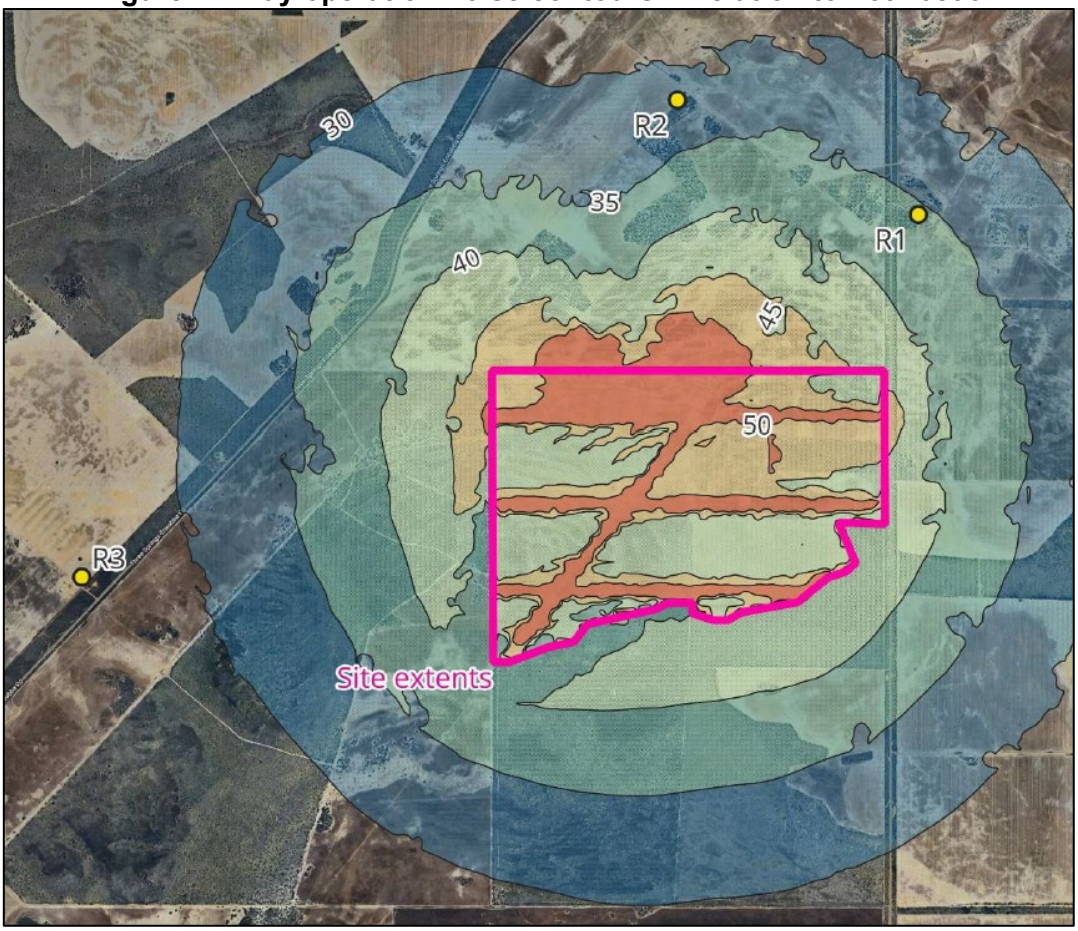
There are 5 residences in the vicinity of Lot 10896, and the below measurements are taken from these residences to the perimeter boundary of Lot 10896 (i.e. they are a measure to the closest solar panel and distances to the BES and substation are greater):
R1 – 1.4km north-east of Lot 10896;
R2 – 2.4km north of Lot 10896 (this residence is not a third-party residence);
R3 – 3.4km west of Lot 10896;
R4 – 7.1km west of Lot 10896;
R5 – 9km south-west of Lot 10896.

It is noted that the 'Rural' zoning of the surrounding area does reduce the likelihood of further subdivision (and with it potential introduction of additional noise sensitive premises) to encroach towards Lot 10896. It is also noted that the 1,264.7346ha property to the immediate north of the development, which is sited in proximity to the BESS and substation locations is also owned by the applicant (Extension Hill Pty Ltd).

Figure 6 – Sensitive premises in relation to Lot 10896



Figure 7 – Day operation noise contours in relation to Lot 10896



Visual Impact

The WAPC's Visual Landscape Planning in Western Australia provides guidance for the assessment of impacts on the visual landscape. A Visual Impact Assessment was prepared by the applicant, which is Appendix F in the application provided as **Attachment 1**. The Assessment concluded there would be minimal visual impact from most vantage points excepting from a section of Eneabba-Three Springs Road where there would be moderate visual impact.

It is noted that the solar farm would be sited in a landscape that already has a significant visual impact in the form of the 330kV transmission line. It is also noted that Turkey Flat Road is not a significant tourism route instead used mainly for farming related activity with its peak period being during harvest, and that Eneabba-Three Springs Road is not considered a major tourism route.

The Visual Impact Assessment outlines mitigation measures, including planting near Eneabba-Three Springs Road (this would be on the applicant's neighbouring Lot 10897 to the north of Lot 10896) to reduce the potential visual impact.

Figure 8 - Existing impact on visual landscape



Schedule 2 – Development Requirements of the Scheme does not specify any landscaping requirement specific to this zone or particular type of development. Therefore there is no minimum landscaping requirements applicable to the proposed development. Notwithstanding this, a condition of approval could be imposed requiring a Landscape Plan be submitted for approval by the Shire prior to the commencement of development. Further a second condition of approval could be imposed requiring the applicant to implement the landscaping shown on the approved landscape plan and that the landowner must thereafter maintain the landscaping to the satisfaction of the Shire.

Solar panels have the potential to cause glare and reflect light. As a result, the proposed development does have the potential to impact on the amenity and character of the locality. This is an issue that has been raised on other solar farm developments and has generally been addressed by way of conditions of approval which require the solar panels to comply with the relevant Australian Standards to ensure that the off-site visual impacts of the development are minimised.

It is noted that the purpose of the solar panels is to absorb sunlight and convert it into electricity, and therefore minimising the light reflected is a key design goal. Panel design typically includes an absorbent surface material, and not glass, which materially reduces glare.

Given the proposed BESS and substation aspects of the development would operate 24 hours a day 7 days a week, there would be a requirement for outdoor lighting at the subject site which has the potential to have off-site visual impacts.

Previous DAP approvals of solar farms have been made subject to condition that the applicant prepare a Light Reflection and Emissions Management Plan that demonstrates how the proposed solar panels and lighting would not cause adverse off-site visual impacts to the surrounding properties and locality to the satisfaction of the local government.

Bushfire

The southern half of Lot 10896 is identified as bushfire prone upon the Department of Fire & Emergency Services State Map, the solar farm is not proposed in this area. The DFES State Map does identify the perimeter of the proposed development area along its southern boundary and sections of its western and eastern boundary as being bushfire prone where the 50m mapped buffer area around native vegetation overlaps the development area.

The permanent office/administration and workshop buildings are sited outside the DFES identified bushfire prone area and resultantly there is no formal requirement to assess the proposal against State Planning Policy 3.7 – Planning in Bushfire Prone Areas and the Planning for Bushfire Guidelines.

The aspects of the development that are within a bushfire prone area are not considered habitable buildings and on this basis there is not a statutory planning requirement for this infrastructure to comply with any specific planning bushfire requirements.

However, some battery components of the BESS might be considered hazardous and warrant consideration.

The applicant has therefore prepared a Bushfire Management Plan and Bushfire Risk Plan which are provided as Appendix H in the application (refer **Attachment 1)**. This BMP provides recommendations in regards to development design and ongoing maintenance to manage bushfire risk, including relating to asset protection and separation distances both internal and external, access points and network, firefighting infrastructure and monitoring equipment.

The recommendation of this report is that conditions, and advice notes, be applied to any approval of the development requiring the applicant to update (and subsequently implement) the Bushfire Management Plan with regard to the technical comment

provided by the Department of Fire & Emergency Services during the consultation period (see Schedule of Submissions provided as **Attachment 3** for further detail).

Environmental

The development has been planned so that it is upon the previously cleared and farmed portion of Lot 10896 and with regard for conserving remnant vegetation. The development is located away from the minor tributary that runs through the south-eastern corner of Lot 10896.

Heritage

Lot 10896 does not contain any sites identified on the Department of Planning, Lands and Heritage Aboriginal Heritage Inquiry System, or the Heritage Council's State Heritage Register, or the Shire's Local Heritage Survey/Municipal Inventory of Heritage Places.

The applicant has met with Yamatji Southern Regional Corporation to discuss their project and will undertake a heritage survey and adopt an 'avoidance' approach should items be uncovered during the survey.

Decommissioning

The application estimates that the expected operational lifespan of the solar farm would be 25-30 years.

However, it is recognised the solar farm could continue beyond the standard lifespan of the panels with incremental reductions in original component capacity, or the solar farm could undergo a gradual replacement program with new solar panels.

To address the issue of the solar farm's operational life it is recommended that conditions of any approval address the development's eventual decommissioning phase when it is expected it would be returned to its prior state and availability for farming.

At such time as the solar farm is to be decommissioned then it should be the responsibility of the applicant/landowner to remove all structures from the subject site and rehabilitate the site so it can be used for rural purposes again. This will ensure that the development does not remain at the subject site after ceasing operations which would be a detriment to the amenity and character of the locality and a reduced primary production economic return for the local economy. A recommended condition of approval has therefore been included to address decommissioning and site rehabilitation.

Conclusion:

It is considered that the application for a solar farm, BESS and substation upon Lot 10896 can be supported based on the following:

- the development will provide local economic benefit through the creation of employment opportunities at both the construction and operational phases and represents a significant investment in the region and further diversification of the economic base;
- the development will increase the level of power produced through renewable energy sources and see further development of the Midwest as the state's

renewable energy hub following approval and development of several other large wind and solar farms in recent years;

- whilst the facility will have some visual impact on Eneabba-Three Springs Road and Turkey Flat Road there is ability to reduce this to some degree through imposition of a landscaping/screening condition;
- the most significant visual impact associated with this development would be the 330kV transmission line, but this is already in existence;
- post-construction phase the traffic impact of the facility would be minimal with a maximum of 5 employees;
- the closest residences are over 1km from the edge of the site and there is limited ability for further encroachment of residences towards the facility due to the large surrounding lot sizes and general disinclination of the Western Australian Planning Commission to support subdivision of rural land;
- the closest property to the BESS and substation components of the development is owned by the applicant;
- Lot 10896 does not contain any Aboriginal cultural heritage sites identified by the Department of Planning, Lands & Heritage or European heritage sites identified by the Heritage Council of WA or local government;
- the identified site does not require clearing of remnant vegetation;
- the identified site is not in proximity to watercourses or areas subject to drainage issues;
- the consultation period with surrounding landowners indicated a level of indifference/acceptance for this development;
- the consultation period with state government agencies identified no significant issues that would give reason to refuse the development, all received submissions provided technical comment and identified aspects where conditions of approval could be implemented to address the received comments;
- the application is similar to 2 other solar farm/BESS applications that have been approved by DAP in the Shire of Three Springs;
- the relatively gentle slope across the site would remove the need for extensive earthworks as part of the development;
- there is ability for the site to be returned to its previous farming use at such time as the solar farm is no longer viable/required;
- there is ability for the site to be have some farming use during its operation through grazing which also will control fuel load and assist in fire management;
- there should be a level of consistency and fairness applied, considering that were an identical project upon this site have been proposed by Western Power (rather than by a private proponent) it would have been exempted from the planning process pursuant to Schedule 1(24) of the *Public Works Act 1902*;
- It is considered that this application aligns with the following guiding aspect of the DPLH's Position Statement upon Renewable Energy Facilities:
  "Facilities should be located near the grid to minimise clearing of vegetation for grid connection power lines. Solar arrays over a large area may have a significant effect on the clearing of native vegetation. Already cleared farming land may offer a practical solution to minimise any environmental impact." (page 3)

Renewable Energy Facility (Solar Farm, Battery Energy Storage System and Substation)

Lot 10896 Turkey Flat Road, Kadathinni Development Application

June 2025 | 25-075

element. | PART OF SLR

Acknowledgment of Country

We acknowledge the Whadjuk people of the Noongar nation as Traditional Custodians of the land on which we live and work.

We acknowledge and respect their enduring culture, their contribution to the life of this city, and Elders, past and present.

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Key Application Details

Development Application Details

Proposed Development	Proposed Renewable Energy Facility (Solar Farm, Battery Energy Storage System (BESS) and Substation)
Applicant	Element Advisory (part of SLR) on behalf of Trina Solar (Australia) Pty Ltd
Landowner	Extension Hill Pty Ltd
Type of approval sought	Development Application to be determined by Development Assessment Panel (DAP Form 1)
Property Address	Lot 10896 Turkey Flat Road, Kadathinni
Legal property description	Lot 10896, Plan 210818, Volume 1556 Folio 965
Subject site lot area	14,052,001m^2 (1,405.2001 hectares)
Development footprint	6,200,000m^2 (620 hectares)
Development value	$700 million

Planning Framework Details

Local Government Area	Shire of Three Springs (the Shire)
Region Scheme and Zoning	N/A
Local Planning Scheme and Zoning	Shire of Three Springs Local Planning Scheme No. 2 (LPS 2) – – Rural
Aboriginal and/or Local Heritage Considerations	No registered Aboriginal heritage sites and no other listings of local, State or national significance at the subject site.
Environmental Considerations	No identified environmental matters except bushfire.
Relevant State Planning Policy, Development Control Policy, Position Statements and/or Planning Bulletins	State Planning Policy 2.5 – Rural Planning State Planning Policy 2.0 – Environment and Natural Resources Policy State Planning Policy 3.7 – Planning in Bushfire Prone Areas Position Statement: Renewable Energy Facilities Government Sewerage Policy
Relevant Local Planning Policy (LPP)	N/A

Consultant List

This development application has been prepared on behalf of Trina Solar (Australia) Pty Ltd with input from the following technical consultants:

Consultant List

Discipline	Consultant
Planning	Element Advisory (as part of SLR)
Noise	SLR
Cultural Heritage	Element Advisory (as part of SLR)
Social Engagement	SLR
Traffic and Transport	SLR
Visual Impact Assessment	SLR
Ecology	SLR
Bushfire Management	Linfire

1. Introduction

This report has been prepared by Element Advisory (part of SLR) (Element Advisory) on behalf of Trina Solar (Australia) Pty Ltd (Trina Solar) in support of a development application for a proposed 'renewable energy facility' including a solar farm, Battery Energy Storage System (BESS) and substation at Lot 10896 Turkey Flat Road, Kadathinni. The development is to be known as the Killawarra Solar and BESS Project.

The subject site has been selected for the renewable energy facility due to its strategic location between South West Interconnected System[1] (SWIS) terminals and its proximity to Western Power's Northern Energy Link – Western Power's upgrade project.

The development proposes a 400MW solar farm and 400MW battery storage with 4 hours duration, which is equal to 1.6GW hours of battery storage. The development will store electrical energy generated by the on-site solar farm and is anticipated to be the biggest solar farm in WA, as well as one of the biggest battery storage projects.

This report provides an overview of the subject site and the proposed development, along with a detailed assessment of the development against relevant planning requirements and an examination of the planning merits of the proposal.

This report is accompanied by all required information including plans and elevations, as well as supporting technical reports as follows:

- Appendix A – Certificates of Title
- Appendix B – Technical Drawings
- Appendix C – Engagement Summary Report
- Appendix D – Noise Assessment Report
- Appendix E – Traffic Impact Assessment
- Appendix F – Visual Impact Assessment
- Appendix G – Flora and Fauna Assessment
- Appendix H – Bushfire Management Plan
- Appendix I – Bushfire Risk Management Plan

As detailed in this report, the development is considered appropriate for the location and will provide important new renewable energy infrastructure to assist the State in meeting its renewable energy targets. Approval of the application is therefore sought subject to relevant and reasonable conditions.

1.1 Requirement for Planning Approval

The proposed development has an estimated cost of development of $700 million. The applicant has elected to 'opt-in' to have the Regional Development Assessment Panel (RDAP) determine the application.

1 The SWIS is Western Australia's main electricity network, which serves most of the state's population, with 7,750 km of transmission lines and 93,350km of distribution lines. It serves more than 1.1 million customers.

2. Subject Site

2.1 Site Description and Context

The subject site is formally described as set out in Table 1 below.

Table 1. Subject Site Particulars

Lot	Plan	Vol/Folio	Street Address	Landowner	Area
10896	210818	1556/965	Turkey Flat Road, Kadathinni	Extension Hill Pty Ltd	14,052,042m^2 (1,405ha)

Please Refer to Appendix A – Certificates of Title

In a regional context, the subject site is located approximately 22 kilometres southwest of the Three Springs townsite, 27 kilometres west of Carnamah, 250 kilometres north of Perth and 137 kilometres southeast of Geraldton. The subject site is located in the Shire of Three Springs (the Shire).

The land is predominately flat, minimising any future earthwork requirements. The location is depicted in Figure 1. Whilst the subject site has an area of 1,405 hectares, the development footprint of the proposed development is significantly less. The development footprint comprises an area of approximately 620 hectares (equating to 44% of the subject site) and is located in the northern part of the subject site, which is predominantly existing cleared land.

Please Refer to Figure 1 – Location Plan

The land is owned by Extension Hill Pty Ltd. A miscellaneous licence mining tenement is held over the entire site area by MGM Pipelines Pty Ltd. MGM Pipelines Pty Ltd is a company related to the land owner, Extension Hill Pty Ltd. MGM Pipelines Pty Ltd is aware of, and supports, the current development application for the subject site. A Western Power high voltage overhead transmission line also intersects the subject site.

The land is accessible via Turkey Flat Road, which is an unsealed rural road. This provides access to the subject site from the surrounding network of sealed roads including Eneabba–Three Springs Road which is located to the north west of the subject site. Turkey Flat Road is in good condition and is currently utilised by surrounding farms for rural traffic (grain and livestock trucks, agricultural equipment and light vehicles).

The subject site is currently used for agricultural purposes, including livestock grazing. A minor tributary intercepts the southeast corner of the subject site.

Surrounding land is predominantly rural in nature, dominated by agricultural properties, including retained remnant vegetation, as well as local roads, access tracks and nature reserves. The surrounding area has a low population density, with only three (3) rural dwellings within a five (5) kilometre radius of the development footprint. A further two (2) rural dwellings are located within a ten (1) kilometre radius of the development footprint.

Refer to Figure 2 – Aerial Plan

Refer to Figure 3 – Site Plan



Figure 1 – Location Plan

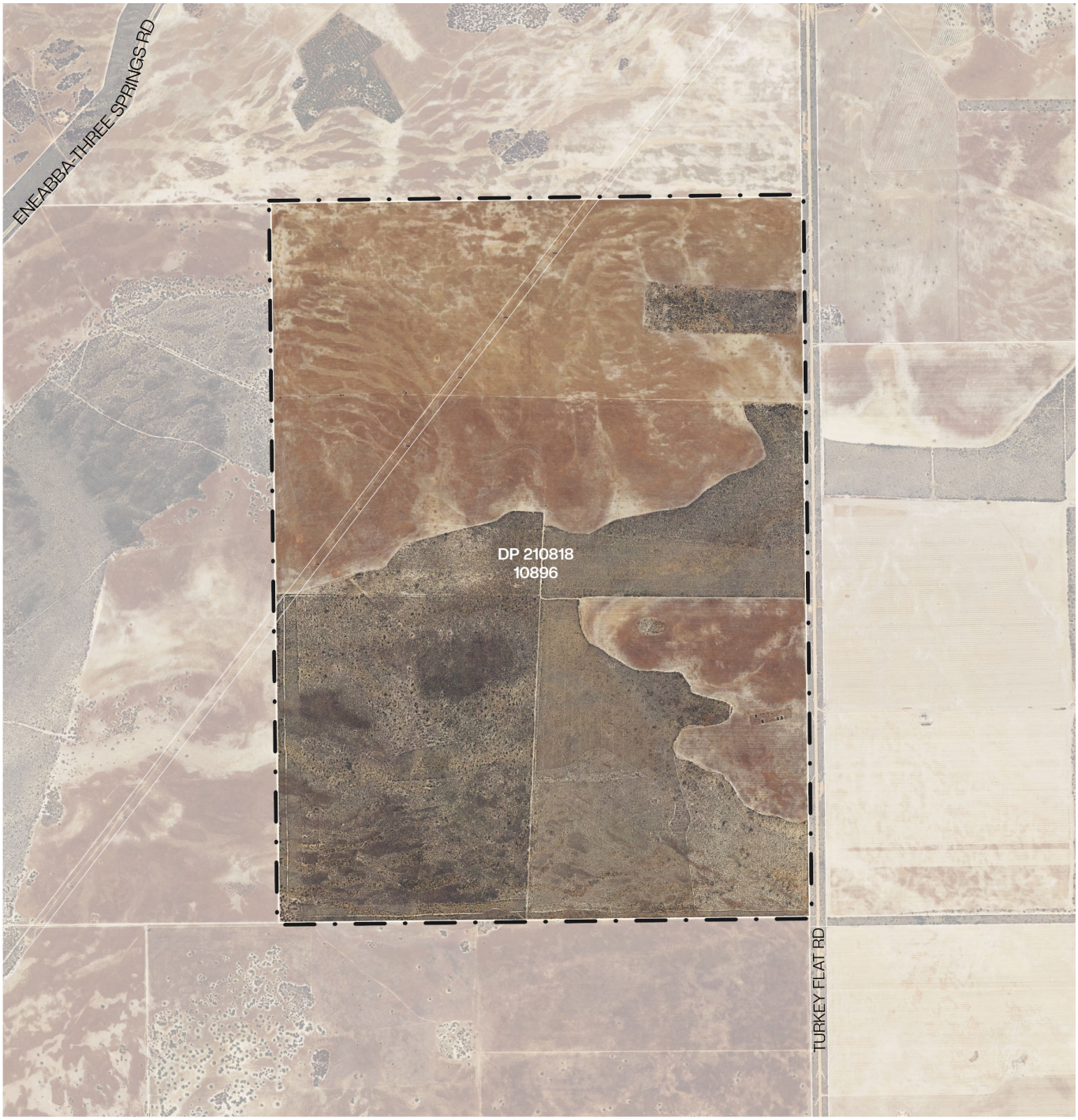


Figure 2 – Aerial Plan



Subject Site
Cadastre
Easements

Figure 3 – Site Plan

2.2 Environmental and Heritage

2.2.1 Heritage

A search of the Department of Planning, Lands and Heritage (DPLH) Aboriginal Heritage Inquiry System (AHIS), the Heritage Council's State Heritage Register and the City's Local Heritage Survey indicates there are no listings of local, State or national significance at the subject site.

The nearest Aboriginal Heritage site is located approximately 14.5 km east of the subject site and is known as the Yarra Yarra Lakes registered site. The subject site is covered by the Yamatji Nation determination (WCD2020/001) and the Yamatji Nation Indigenous Native Title Agreement (WI2020/002).

Trina Solar has met with Yamatji Southern Regional Corporation (YSRC) Heritage and Community managers and discussed the project with reference to likely ground disturbance, amongst other matters. Trina Solar is in the process of settling a Heritage Protection Agreement with YSRC and all matters between the parties are agreed. Trina Solar has committed to undertake a heritage survey pursuant to that Agreement and has indicated to YSRC that they will progress the project using an 'avoidance' approach should any further ACH be uncovered during the Survey.

2.2.2 Vegetation

The subject site is not identified as being affected by any Threatened Ecological Communities (TECs). The development footprint within the subject site has only minimal intact vegetation. There is some limited vegetation located in a narrow strip, which extends eastward from the western boundary of the subject site. There are also some isolated trees and shrubs within the existing cleared areas of the paddock.

Additional areas of intact vegetation are located in adjacent remnant vegetation along Turkey Flat Road.

2.2.3 Contamination

A desktop search of the Department of Water and Environmental Regulation's (DWER) Contaminated Sites database indicates that the subject site is not identified as being contaminated.

2.2.4 Acid Sulphate Soils

A desktop search of DWER's Acid Sulphate Soils Maps indicates that the subject site is not located within an area subject to acid sulphate soils.

2.2.5 Bushfire

A portion of the subject site is mapped within a Bushfire Prone Area. Relevant matters associated with bushfire risk have been set out at Sections 4.8 and 5.1.5.

Refer to Figure 4 – Bushfire Prone Vegetation Mapping

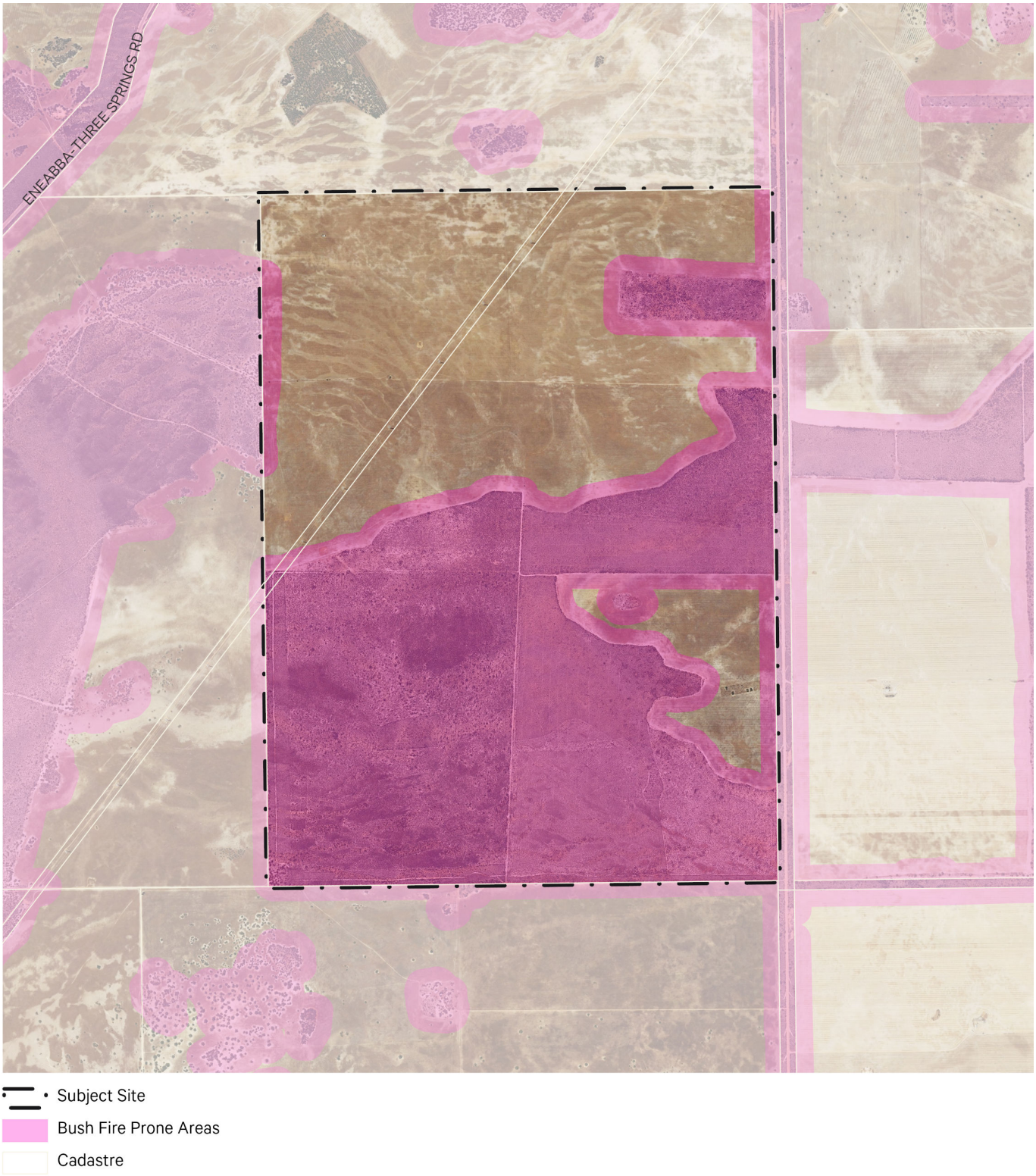


Figure 4 – Bushfire Prone Vegetation Mapping

3. Background and Engagement

3.1 Pre-lodgement Discussions

The project team has consulted closely with the Shire throughout the pre-application process. The initial meeting was held with the Shire on 18 September 2024, followed by a Councillor briefing in December 2024. Matters discussed at these meetings included visual impacts, agri-solar management, traffic impacts and bushfire risk. These early discussions with the Shire helped to inform the approach to the formal communications and stakeholder engagement (CSE) program and the development application.

3.2 Communications and Stakeholder Engagement

An eight (8) week formal CSE program was delivered by SLR between Monday, 3 February 2025 and Friday, 28 March 2025.

The purpose of the CSE program was to build awareness and understanding of the project and capture initial stakeholder and community feedback for consideration in the development application.

Insights garnered through consultation have supported the project's understanding of potential impacts, mitigation strategies and opportunities to support strong outcomes for the Three Springs community.

The CSE program involved engagement with strategic community and stakeholder cohorts that were identified based on their respective levels of interest in, and influence over, various elements of the project.

A range of activities were delivered by SLR to share information including project briefings and meetings with stakeholders, and a community information session for Shire of Three Springs residents and businesses. Various channels, including targeted posted letters, emails, social media, and print advertising, were used to promote the consultation opportunities.

Key issues raised during the CSE program include:

- The need to consider potential in-kind and financial supports as part of the project's community benefits program.
- The need to integrate agri-solar management to allow livestock grazing within the solar farm area.
- A desire to consider how the project can contribute to new housing assets within the Shire or activate existing unused assets.
- The need to consider ways to incentivise the relocation of the construction workforce and encourage productive interactions between the workforce and the township to bolster the local economy.

It is recommended that the project continue to foster strong relationships with regulatory and community stakeholders and provide regular updates on project progress.

Further details are provided in the Engagement Summary Report prepared by SLR at Appendix C.

Refer to Appendix C – Engagement Summary Report prepared by SLR

4. Proposed Development

4.1 Land Use

The proposed development is for a new 'renewable energy facility' comprising a solar farm, BESS and substation.

4.2 Development Summary

Trina Solar propose to construct and operate a PV solar farm and BESS hybrid development to be known as the 'Killawarra Solar and BESS Project'. The proposal involves the installation of a solar farm, BESS and sub-station at the subject site. The proposal will supply renewable energy to the SWIS via the 330kV transmission line which passes through the subject site. More specifically, the proposal comprises:

- A 400 MW solar farm, including over 680,000 solar panels and associated inverter stations. Each solar panel is mounted on a tracker and sits approximately 1.5 metres above ground level.
- 400 MW (1600 MW hours) of battery energy storage in a BESS, encompassing approximately 504 BESS containers, which have an overall height of 2.896 metres on top of a concrete foundation.
- A purpose-built substation and switchyard (to be managed by Western Power). The substation will include lightening masts up to 20 metres high.
- Operations and Maintenance Building, which is located outside and to the south of the Western Power substation and switchyard. This building will incorporate toilets, staff facilities including meeting room, lunchroom and workstations, server room, battery room and LV panel room. The Operations and Maintenance Building will have an overall height of 4.368 metres.
- Storage/Maintenance Building, which is located outside and to the south of the Western Power substation and switchyard. This building is to be constructed of zicalume steel and has an overall height of 8.05 metres.
- Storage/Workshop Building within the BESS yard.
- Fire water tanks located throughout the subject site.
- Access roads within the subject site.

The footprint of the project area is approximately 620 hectares.

The substation is proposed adjacent to the northern boundary of the subject site. The substation location has been selected due to proximity to existing power lines to promote easy and efficient access to the existing 330kV transmission line passing through the proposed subject site. Relevant approvals will be obtained from Western Power for the substation design and connection to the transmission line.

Please refer to the plans and elevations prepared by Trina Solar and provided at Appendix B.

Refer to Appendix B – Technical Drawings prepared by Trina Solar

4.3 Construction Program

Construction of the proposed development is expected to commence in 2025, with the development proposed to commence operation in 2026.

Access to the proposed development will be via Tukey Flat Road. During construction activities, traffic is expected to increase, and additional measures will be put in place to account for the expected increase in traffic.

All construction workforce will be briefed on the recommended route with a Driver's Code of Conduct that will be prepared by the applicant. During construction, 60 km/hr speed restrictions for B–Double design vehicles will be followed on Turkey Flat Road.

4.4 Environmental Impacts

SLR has undertaken a desktop assessment and flora and fauna site visit to identify key flora, vegetation and fauna values within the subject site as part of the environmental impact assessment process. The Flora and Fauna Assessment presents the findings of the surveys (refer to Appendix G). A summary of the key findings of this assessment are as follows:

- The impact on existing vegetation has been considered during the design stage. A tree protection zone is accommodated within the design to retain.
- Proposed infrastructure has been located so that the main impact will be on land that has been previously cleared or is in a completely degraded condition as a result of agricultural use, weed invasion, farm infrastructure or grazing. A tree protection zone is accommodated within the design to retain some existing trees which are located within the development footprint area.
- One potential black cockatoo breeding tree (Coastal Blackbutt (Eucalyptus todtiana)) is required to be removed. However, no hollows or evidence of breeding or foraging was observed during the survey.
- It is considered that the proposed development will have minimal direct impacts on the environment, and management measures will be put in place to ensure no indirect impacts arise as a result of the development.
- The location of the proposed development will not impact on the minor tributary that intersects the southeast corner of the subject site.
- It is anticipated that there will not be a need for a formal Environmental Impact Assessment.
- Given the proposed land use is not considered to be a prescribed premise under the *Environmental Protection Regulations 1987*, it is unlikely that a works approval will be required for the construction of the development.
- If a vegetation clearing permit under Part V of the *Environmental Protection Act 1986* (EP Act) is required in relation to the potential Black Cockatoo nesting tree that requires clearing, Trina Solar will apply for one.
- If a referral to the Commonwealth Minister for Environment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is required in relation to Matters of National Environmental Significance (MNES), Trina Solar will undertake the referral as required.

Refer to Appendix G – Flora and Fauna Assessment prepared by SLR

4.5 Visual Amenity

A Visual Impact Assessment (VIA) has been prepared by SLR (Appendix F). The VIA characterises the existing landscape and assesses the potential visual amenity and landscape impacts of the proposed development in relation to existing and potential future impacts.

Viewpoints were identified by SLR based on desktop assessments of the surrounding area, which identified points of interest including nearby residents, major roads, nature reserves and Aboriginal Cultural Heritage sites. Viewpoints selected were determined to best represent a range of distances, sensitivities and differing views of the project. As demonstrated in the VIA, the project is predicted to result in no visual impacts to eight (8) of the nine (9) viewpoints, with one viewpoint assessed as having moderate impacts.

In this regard the project is expected to be just visible from the Three-Springs Eneabba Road. The visual impact at this location has been rated as moderate as the low-lying nature of the proposed infrastructure will largely result in it being screened from view by vegetation and/ or the topography of the land. Where the project is expected to be visible, the significance of the change is limited as modified elements are already present in the existing views and, therefore, the project is not expected to fundamentally change the landscape character at the assessed locations.

Overall, implementation of the project was predicted to have low visual impact as there was little visibility due to the screening effects of landforms and vegetation surrounding the subject site and thus negligible change to visual amenity and landscape character.

The project was therefore considered to have met the Visual Management Objectives (VMOs) due to the following:

- The project does not result in a dominant change in view for moderate to high sensitivity viewpoints that are located >1 km from the project.
- The project does not result in the removal of valued characteristics, nor does it result in significant alteration or disruption to views of these valued characteristics.

Refer to Appendix F – Visual Impact Assessment prepared by SLR

4.6 Traffic and Access

A Traffic Impact Assessment (TIA) has been prepared by SLR (Appendix E). A summary of key findings from the TIA is provided below.

- Access to the subject site will be via Turkey Flat Road off Eneabba-Three Springs Road.
- The main access is located in the north-eastern corner of the subject site with a second access point in the south-eastern corner.
- Turkey Flat Road is unsealed and approximately 6-7m in width. Currently the traffic along Turkey Flat Road is very low and is typically associated with rural business operations.
- The development is expected to generate additional traffic of approximately 13,907 inbound and 13,907 outbound trips during the assumed construction period of 12 months or 312 working days. As a result, the daily traffic generation is anticipated to be in the order of 44-45 inbound and 44-45 outbound trips a day. It is worth noting that, given the conservative assumptions used in the TIA, this is expected to be worst-case peak traffic.
- The TIA identifies that the intersections which serve the subject site will continue operating satisfactorily during the construction of the project. Intersection performance analysis was undertaken at four study intersections and concluded that the road network, in its existing form, will accommodate the traffic impacts of the proposed project.

- It is recommended that the Eneabba–Three Springs Road/ Turley Flat Road intersection be upgraded with Basic Right Turn (BAR) and Basic Left Turn (BAL) treatments to improve road safety.
- In addition (although not a strictly necessary), one design vehicle's length (27.5m) should be sealed on Turkey Flat Road at the Eneabba–Three Springs Road intersection (southeast leg of the intersection) to minimise and mitigate the migration of gravel from Turkey Flat Road onto Eneabba–Three Springs Road.
- It is expected that a construction traffic management plan (CTMP) and road dilapidation reports will be required as conditions of approval.
- Once the development becomes operational, the traffic on Turkey Flat Road is expected to return to light levels as the development will be unstaffed.

Refer to Appendix E – Transport Impact Assessment prepared by SLR

4.7 Noise

A Noise Assessment has been prepared by SLR (Appendix D). A noise model was developed based on preliminary plans, supplied information and historical measurements to predict noise levels at the nearest sensitive receptors. These predictions were assessed against the relevant targets to determine the potential for compliance with the *Environmental Protection (Noise) Regulations 1997* (EP Noise Regs). Key findings of the Noise Assessment are summarised below.

Noise Generated During Construction

- It is anticipated that construction works will only be carried out between 7:00am and 7:00pm on any day other than a Sunday or public holiday.
- In light of this, the noise emissions from construction works are compliant under the EP Noise Regs. A noise management plan can be provided if considered necessary.

Noise Generated During Operation

- During operation, the sources of noise emissions from the BESS containers and inverters are mainly due to fan operation.
- The predicted noise levels at the nearest sensitive receptor indicates that noise emissions from the project comply with the EP Noise Regs for the day, evening and night periods.

It is recommended if changes to the equipment or layout are made, the noise emissions of the modified design or equipment should be reviewed.

The noise levels associated with the proposed development will not have unreasonable impacts on the amenity of the sensitive receptors and therefore the noise emissions are not expected to propose a constraint to the approval of the development.

Refer to Appendix D – Noise Assessment prepared by SLR

4.8 Bushfire Management

Trina Solar has engaged Linfire to prepare a Bushfire Risk Management Plan (BRMP) to demonstrate the bushfire risk has been appropriately managed for the development. Recommendations from the BRMP include:

- Onsite vegetation modification and management will be required for the lifetime of the development to maintain specified Non-Vegetated Zones (NVZ) and Asset Protection Zones (APZ).
- Providing specified separation distances between different renewable infrastructure within the subject site.
- The provision of at least two (2) access points, with gates, to the facility, to ensure access to/from the facility to the greater road network.
- Provision of perimeter road to the BESS cells, with access in between BESS cells.
- Provision of perimeter loop roads to the solar arrays with at least two access points to each array.
- Provision of above ground water tanks in concrete or steel, appropriately signed and set back with vehicular access.
- Provision of a mobile fire trailer.
- Use of system monitoring for all electrical infrastructure, to ensure that any electrical or equipment failures with the potential to ignite or propagate fire are rapidly identified and relevant site personnel notified to enable early fire brigade notification. Monitoring is to be configured to provide warning to relevant onsite and offsite personnel.
- All infrastructure to meet specified construction standards with appropriate monitoring and suppression systems.

For a comprehensive list of all the specified requirements to appropriately manage bushfire risk, refer to the Bushfire Risk Management Plan at Appendix I.

Refer to Appendix I – Bushire Risk Management Plan prepared by Linfire

4.9 Services

The proposed land use does not necessitate the need for any site services.

Power from the subject site will be used to provide lighting and other power needs within the subject site.

Water on the subject site will be supplied from a groundwater licence (GWL159202), which is currently in the process of being renewed. The licence allocation was previously for 5,500,000KL

4.10 Stormwater

Stormwater run off from the proposed buildings and equipment is expected to be readily managed on site. A stormwater management plan can be prepared as a condition of approval as required.

4.11 Waste

Given the switchyard will be unattended there will not be any generation of solid waste. It is proposed that any solid wastes generated on site by visiting maintenance staff be collected on-site and disposed of off-site by the visiting employee/s.

4.12 Sewerage

An on-site effluent disposal system (i.e. septic system incorporating leech drain or similar) will be required for the proposed on site toilets. The appropriate approvals will be sought from the Shire and/or the Department of Health as required following the issue of development approval.

5. Applicable Planning Framework and Technical Assessment

5.1 State Planning Framework

5.1.1 State Planning Strategy 2050

The Western Australian Planning Commission (WAPC) is required to prepare and keep under review a planning strategy for WA. The State Planning Strategy 2050 is the highest-level strategic planning document in WA. It contemplates planning as part of its broader economic, social and environmental context, both in Australia and globally. The strategy provides a basis for Government to plan for the State's physical and social infrastructure, environment, food security, land availability, economic development, housing accessibility, security, education and training. There are six principles that underpin and inform the State Planning Strategy:

- Community – enable diverse, affordable, accessible and safe communities
- Economy – facilitate trade, investment, innovation, employment and community betterment
- Environment – conserve the State's natural assets through sustainable development
- Infrastructure – ensure infrastructure supports development
- Regional Development – build the competitive and collaborative advantages of the regions and
- Governance – build community confidence in the development processes and practices

Energy cost and supply is identified as a constraint to export driven economic development in WA.

Table 2 provides comment on the applicable objectives and aspirations of the Strategy relating to energy.

Table 2. Relevant Objectives and Aspirations of State Planning Strategy 2050 for Energy

Objective	Aspirations	Applicant Comment
To enable secure, reliable, competitive and clean energy that meets the State's growing demand. Enhanced infrastructure planning and coordination will lead the State into an era of increased energy security. More energy will be sourced from a diverse mix of affordable, low carbon sources. The State's buildings, businesses and industries will be more energy efficient.	– Energy provision remains reliable with few interruptions to service. – The use of offshore and onshore gas fields continues to reduce carbon emissions. – Source diversification and network security supply. – The energy supply is sufficient to meet demand over the longer term.	The proposed development will generate and store clean energy which will assist in meeting the State's aspirations for reliable supply and energy security whilst supporting decarbonisation.

The proposed development is consistent with the relevant objectives and aspirations of State Planning Strategy 2050 as it relates to energy. The project will assist with investment in renewable energy technologies, while reducing fossil fuel dependence and reducing the State's greenhouse gas emissions.

5.1.2 Planning and Development (Local Planning Schemes) Regulations 2015

Clause 67(2) of Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015* (the Deemed Provisions), specifies matters which are to be given due regard when determining applications for development approval.

An assessment of the proposed development against the relevant matters outlined in Clause 67(2) of the Deemed Provisions has been undertaken. A summary of the assessment is provided in Table 3 below.

Table 3. Clause 67(2) assessment

Provision	Response	
a. *the aims and provisions of this Scheme and any other local planning scheme operating within the Scheme area;*	Please see below discussion at Section 5.2.2. In summary, the proposed development is consistent with the aims of the Shire's Local Planning Scheme No. 2 (LPS 2), as it – – Does not prejudice, and can co-exist with, the predominant use of the subject site for agricultural purposes (grazing); – The visual impacts of the proposal have been assessed and determined to not adversely impact on the rural character of the area; – Comprises a small footprint across a vast site area and will not impact on the rural character of the area more generally; and – Will not result in any amenity impacts or land use conflict.	✓
b. *the requirements of orderly and proper planning including any proposed local planning scheme or amendment to this Scheme that has been advertised under the Planning and Development (Local Planning Schemes) Regulations 2015 or any other proposed planning instrument that the local government is seriously considering adopting or approving;*	The requirements of orderly and proper planning are addressed at Section 6.	✓
c. *any approved State planning policy;*	The proposed development has been assessed against and is considered to comply with the relevant provisions of State Planning Policy 2.5 – Rural Planning and State Planning Policy 3.7 – Planning in Bushfire Prone Areas. Refer to the additional comments in Sections 5.1.3 and 5.1.4 for an assessment against the relevant provisions of the SPPs below.	✓
d. *any environmental protection policy approved under the Environmental Protection Act 1986 section 31(d);*	N/A – the proposed development does not trigger significant thresholds for environmental factors.	N/A

Provision	Response	
e. *any policy of the Commission;*	The proposed development has been assessed against and is considered to comply with the relevant provisions of Position Statement: Renewable Energy Facilities (WAPC, 2020)	✓
f. *any policy of the State;*	Please see below discussion in relation to the Government Sewerage Policy at Section 4.1.4.	✓
fa. *any local planning strategy for this Scheme endorsed by the Commission;*	The proposed development has been considered against and found to be consistent with the intent and objectives of the Shire's Local Planning Strategy. Refer to Section 5.2.1.	✓
g. *any local planning policy for the Scheme area;*	There are no relevant local planning policies.	N/A
h. *any structure plan or local development plan that relates to the development;*	There is no applicable structure plan or local development plan.	N/A
i. *any report of the review of the local planning scheme that has been published under the Planning and Development (Local Planning Schemes) Regulations 2015;*	N/A	N/A
j. *in the case of land reserved under this Scheme, the objectives for the reserve and the additional and permitted uses identified in this Scheme for the reserve;*	N/A	N/A
k. *the built heritage conservation of any place that is of cultural significance;*	There is no built heritage of significance identified in proximity to the subject site.	N/A
l. *the effect of the proposal on the cultural heritage significance of the area in which the development is located;*	There are no registered or lodged cultural heritage sites located on the subject site. Nonetheless, Trina Solar has met with Yamatji Southern Regional Corporation (YSRC) Heritage and Community managers and discussed the project with reference to likely ground disturbance, amongst other matters. Trina Solar is in the process of settling a Heritage Protection Agreement with YSRC and all matters between the parties are agreed. Trina Solar has committed to undertake a heritage survey pursuant to that Agreement and has indicated to YSRC that they will progress the project using an 'avoidance' approach should any further ACH be uncovered during the Survey.	N/A

Provision	Response	
m. the compatibility of the development with its setting, including — i. *the compatibility of the development with the desired future character of its setting; and* ii. *the relationship of the development to development on adjoining land or on other land in the locality including, but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the development;*	Solar farms are commonly found dispersed throughout rural areas. There are not expected to be any adverse impacts from the proposed development on neighbouring properties associated with height, bulk, scale, orientation or appearance due to the setbacks of the development from the subject site boundaries, the shielding that is provided by the existing remnant vegetation and due to the relatively isolated location of the development. This has been demonstrated in the VIA provided at Appendix F.	✓
n. *the amenity of the locality including the following —* i. *environmental impacts of the development;* ii. *the character of the locality;* iii. *social impacts of the development;*	The proposed development is not expected to have any off-site environmental impacts. The proposed development is not expected to have any adverse environmental impacts or social impacts. The development supports further investment in the Shire and the broader region's contribution to power generation needed to support the State's green energy transformation.	✓
o. *the likely effect of the development on the natural environment or water resources and any means that are proposed to protect or to mitigate impacts on the natural environment or the water resource;*	Only isolated trees and existing vegetation of limited environmental significance is proposed to be cleared. The proposed development will not impact on existing water sources.	✓
p. *whether adequate provision has been made for the landscaping of the land to which the application relates and whether any trees or other vegetation on the land should be preserved;*	Only isolated trees and existing vegetation of limited environmental significance is proposed to be cleared. The proposed development is generally limited to existing cleared areas on the subject site. Large tracts of existing remnant vegetation are to be retained on the subject site. No additional landscaping is proposed or is considered to be necessitated by the development.	✓
q. *the suitability of the land for the development taking into account the possible risk of flooding, tidal inundation, subsidence, landslip, bush fire, soil erosion, land degradation or any other risk;*	The land is suitable for the development having regard to matters of flooding, tidal inundation, subsidence, landslip, bush fire, soil erosion and land degradation.	✓
r. *the suitability of the land for the development taking into account the possible risk to human health or safety;*	The land is suitable for the development considering the possible risk to human health and safety given the separation distances between the development and sensitive receptors.	✓

Provision	Response	
s. *the adequacy of —* i. *the proposed means of access to and egress from the site; and* ii. *arrangements for the loading, unloading, manoeuvring and parking of vehicles;*	The proposed development will be generally unattended. When maintenance is required the maintenance staff will use the proposed internal access roads. Turkey Flat Road provides appropriate access to the subject site for staff. Transport impacts of the proposed development have been assessed in the TIA provided at Appendix E. This demonstrates that the transport impacts are appropriate and only limited upgrade works are needed to support the construction phase of the project. These include: – Eneabba–Three Springs Road/ Turley Flat Road intersection be upgraded with Basic Right Turn (BAR) and Basic Left Turn (BAL) treatments to improve road safety. – In addition (although not a strictly necessary), one design vehicle's length (27.5m) should be sealed on Turkey Flat Road at the Eneabba–Three Springs Road intersection (southeast leg of the intersection) to minimise and mitigate the migration of gravel from Turkey Flat Road onto Eneabba–Three Springs Road.	✓
t. *the amount of traffic likely to be generated by the development, particularly in relation to the capacity of the road system in the locality and the probable effect on traffic flow and safety;*	As set out in this report, once operational, the development will result in limited additional traffic which is expected to be readily accommodated within the existing road network, with intersection performance and network capacities able to operate effectively without modification.	✓
u. *the availability and adequacy for the development of the following —* i. *public transport services;* ii. *public utility services;* iii. *storage, management and collection of waste;* iv. *access for pedestrians and cyclists (including end of trip storage, toilet and shower facilities);* v. *access by older people and people with disability;*	The land use is not located nor appropriate to public transport access considerations. The availability of services is addressed in Section 3.6. Waste management is addressed in Section 3.8. Management of sewerage is addressed in Section 3.9. Access by pedestrians and cyclists and access for older people or people with a disability is not appropriate to the nature of the development nor its location.	✓
v. *the potential loss of any community service or benefit resulting from the development other than potential loss that may result from economic competition between new and existing businesses;*	The development will not result in the loss of any community service or benefit.	✓
w. *the history of the site where the development is to be located;*	The subject site has historically been used for grazing. The subject site will continue to be used for grazing as a means of managing grass in and around the solar panels.	✓

Provision	Response	
x. *the impact of the development on the community as a whole notwithstanding the impact of the development on particular individuals;*	The proposed development is located appropriately within the subject site to limit impacts on remnant vegetation on site. It is considered that the impact of the development on the community as a whole will be positive as a result of continued investment into the local community and is therefore desirable.	✓
y. *any submissions received on the application;*	Any submissions received during advertising (if required) will be considered.	N/A
– *the comments or submissions received from any authority consulted under clause 66;*	Any comments or submissions received from authorities consulted under clause 66 will be considered.	N/A
zb. *any other planning consideration the local government considers appropriate.*	N/A	N/A

5.1.3 State Planning Policy 2.5 – Rural Planning

State Planning Policy 2.5 – Rural Planning (SPP 2.5) applies to all rural zoned land in WA. The intent of SPP2.5 is to protect and preserve rural zoned land, to ensure its economic, natural resource, food production, environmental and landscape values are maintained.

Pursuant to the Shire of Three Springs Local Planning Scheme No. 2 (LPS 2), SPP 2.5 is read as part of LPS2.

Section 5.1 of SPP 2.5 sets out the provisions for the protection of rural land and land uses. Table 4 below provides an assessment of the proposal against the relevant provisions of Section 5.1 of SPP 2.5.

Table 4. Section 5.1 of SPP 2.5 assessment

Provision	Response	
requiring that land use change from rural to all other uses be planned and provided for in a planning strategy or scheme;	The proposed development will enable continued grazing use on the subject site. Renewable energy facilities are generally understood to be complimentary to the rural use of land.	✓
retaining land identified as priority agricultural land in a planning strategy or scheme for that purpose;	The subject site is not identified as priority agricultural land in a planning strategy or scheme.	N/A
ensuring retention and protection of rural land for biodiversity protection, natural resource management and protection of valued landscapes and views;	Only isolated trees and existing vegetation of limited environmental significance is proposed to be cleared. The proposed development is generally limited to existing cleared areas on the subject site. Large tracts of existing remnant vegetation are to be retained on the subject site. As demonstrated in the VIA, there are not expected to be any adverse impacts from the proposed development on landscape or views given the screening that is provided by the existing remnant vegetation and the undulating landscape.	✓

Provision	Response	
protecting land, resources and/ or primary production activities through the State's land use planning framework;	The proposal meets the relevant requirements of the land use planning framework and is consistent with the vision for the Shire articulated in their Local Planning Strategy to support power generation opportunities.	✓
creating new rural lots only in accordance with the circumstances under which rural subdivision is intended in Development Control Policy 3.4: Subdivision of rural land;	No new rural lots are proposed.	N/A
preventing the creation of new or smaller rural lots on an unplanned or ad-hoc basis, particularly for intensive or emerging primary production land uses;	No new rural lots are proposed.	N/A
comprehensively planning for the introduction of sensitive land uses that may compromise existing, future and potential primary production on rural land; and	The proposal is not for a sensitive land use.	✓
accepting the impacts of well-managed primary production on rural amenity.	The proposed development is not for primary production.	N/A

Section 5.5 of SPP 2.5 acknowledges that WA is a large and diverse State with regional variations and that the WAPC's decisions are to be guided by the need to provide economic opportunities for rural communities and to protect the State's primary production and natural resource assets. In this regard, State Planning Strategy 2050 and the LPS both identify the Shire's power generation potential. This is considered to be consistent with the provisions of Section 5.5 (d) of SPP 2.5.

5.1.4 State Planning Policy 2.0 – Environment and Natural Resources Policy

State Planning Policy 2.0 – Environment and Natural Resources Policy (SPP2.0) aims to resolve conflicts between use and protection of natural resources, having regard to potential impacts on the environment, as well as those on community lifestyle and the economy.

The objectives of SPP2.0 are:

- To integrate environment and natural resource management with broader land use planning and decision-making.
- To protect, conserve and enhance the natural environment.
- To promote and assist in the wise and sustainable use and management of natural resources.

Section 5.10 Greenhouse Gas Emissions and Energy Efficiency states that:

> *The primary objective is to reduce greenhouse gas emissions by means including (but not limited to) increasing energy efficiency, decreasing reliance on non-renewable fuels, and increasing usage of renewable energy sources.*

The development complies with this objective as it will generate renewable energy by capturing solar power in a sustainable manner.

5.1.5 State Planning Policy 3.7 – Planning in Bushfire Prone Areas

In accordance with Bushfire Protection Criteria (BPC) 7 (BPC 7; Development – Commercial and Industrial) of the Planning for Bushfire Guidelines, the application of State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP 3.7) and the Planning for Bushfire Guidelines applies only to buildings that are designated as bushfire prone, and have a pre-development radiant heat impact of BAL-40/FZ (i.e., prior to management measures such as Asset Protection Zones).

The permanent buildings proposed as part of this development are sited outside the designated bushfire prone area within the project area, and on this basis, there is no formal trigger to assess the proposal against SPP 3.7 and the Planning for Bushfire Guidelines. However, given the building siting is surrounded by unmanaged grassland, it would likely have a pre-development rating of BAL-40/FZ which could occur without appropriate vegetation management measures.

Application of SPP3.7 and the Planning for Bushfire Guidelines is only required for "habitable buildings" and given the renewable energy infrastructure (e.g. BESS and solar) are not considered "habitable building", assessment is not triggered, however the following is noted:

- As compliance with SPP 3.7 and the Planning for Bushfire Guidelines isn't triggered for proposed renewable energy infrastructure, there is no statutory requirement for this infrastructure to comply with any specific requirements. It is noted that BPC 7 of the WA Guidelines does make reference to hazardous, to the proposed BESS containers which contain Li-ion batteries (or similar), however other parts of the renewable energy infrastructure are not captured under this clause.
- It is noted that the Victorian County Fire Authority (CFA) Design Guidelines and Model Requirements for Renewable Energy Facilities currently has no formal status in WA, however it is understood the Department of Fire and Emergency Services are currently in the process of drafting their own version of the CFA Guidelines, and while the timing of this is unconfirmed, the content is expected to broadly align with that from the CFA.
- The CFA Guidelines contains guidance and what it terms "Model Requirements" for all renewable energy facilities as well as specific measures for wind, solar, battery energy storage (BESS) and substation/electric line infrastructure. It contains a number of sections pertaining to proposed design, construction, commissioning and operational requirements these facilities.
- A key requirement is that a Risk Management Plan (RMP) is developed for renewable energy facilities.
- The objectives of the position statement include facilitate appropriate development of renewable energy facilities while minimising any potential impact upon the environment, natural landscape, and urban areas.
- Solar arrays in bushfire prone areas should be designed and maintained so they are not a bushfire risk to surrounding bushland, and where possible should not be in bushfire prone areas with an 'extreme' bushfire hazard level or bushfire attack level (BAL) – 40 or BAL– Flame Zone.
- A minimum 10 metres clearance to combustible vegetation in the form of an Asset Protection Zone (APZ) is recommended, which should be managed in a low threat state, in accordance with the WA Guidelines.
- Current referral advice typically provided by DFES is that strict compliance is unlikely to be required or achieved with SPP 3.7 and the Planning for Bushfire Guidelines, however application of the CFA Guidelines, provides the best design guidance for these type of renewable energy facilities at this stage.

- The WAPC have release a Position Statement on Renewable Energy Facilities (principally wind turbine and solar array systems), providing some high-level guidance as follows:
    * The objectives of the position statement include facilitate appropriate development of renewable energy facilities while minimising any potential impact upon the environment, natural landscape, and urban areas.
    * Wind turbines and solar arrays in bushfire prone areas should be designed and maintained so they are not a bushfire risk to surrounding bushland, and where possible should not be in bushfire prone areas with an 'extreme' bushfire hazard level or bushfire attack level (BAL) – 40 or BAL-Flame Zone.
    * A minimum 10 metres clearance to combustible vegetation in the form of an Asset Protection Zone (APZ) is recommended, which should be managed in a low threat state, in accordance with the Planning for Bushfire Guidelines.

Based on the regulatory requirements detailed above, the following bushfire compliance approach is proposed in this development:

- Given the proposed buildings are not sited in a designated bushfire prone area, there is no formal requirement to assess the proposal against, and demonstrate compliance with SPP 3.7 and the Planning for Bushfire Guidelines, however given the project area is surrounded by unmanaged grassland such that the initial BAL impact on buildings and infrastructure would be BAL-40 or greater, Trina Solar has elected to voluntarily respond to the bushfire risk through demonstrating compliance with SPP 3.7 and the Planning for Bushfire Guidelines as much as practical. This is to be documented in the Bushfire Management Plan (BMP) (refer to Appendix H).
- A Bushfire Risk Management Plan (BRMP) that accompanies the BMP, assesses the level of compliance of the proposed renewable infrastructure, against the relevant Model Requirements of the CFA Guidelines, to demonstrate the bushfire risk has been appropriately managed. While the Risk Management Plan required by the CFA Guidelines is expected to address both structural fires and bushfires, the focus of the BRMP is to address the bushfire related risk to (and from) the proposed renewable energy infrastructure (refer to Appendix I).
- The BMP has been prepared to address requirements for development applications under SPP 3.7 Policy Measure 7.1 (ii) and Section 2.2 the Planning for Bushfire Guidelines, in addition to Section 7 relating to Commercial/Industrial developments. It demonstrates that all buildings will be sited in BAL-29 or lower, including provision of suitably sized Asset Protection Zones (APZ's; low fuel zones around buildings). It also demonstrates compliant vehicular access and provision of suitable firewater supply.

Refer to Appendix H – Bushfire Management Plan prepared by Linfire

Refer to Appendix I– Bushfire Risk Management Plan prepared by Linfire

5.1.6 Position Statement: Renewable Energy Facilities (WAPC, 2020)

This document outlines the WAPC's requirements to support the consistent consideration and provision of renewable energy facilities within Western Australia. The policy identifies assessment measures to facilitate appropriate development of renewable energy facilities. It seeks to ensure these facilities are in areas that minimise potential impact upon the environment, natural landscape and urban areas while maximising energy production returns and operational efficiency. Notably and consistent with the Position Statement, renewable energy projects, as proposed, can enhance local economies and easily connect into the network grid. The contribution that renewable energy facilities make to the reduction in carbon emissions is an important consideration for the growth of the industry, as well as the socio-economic benefits to the State.

Relevant aspects of the Position Statement and how these have been considered as part of this application are detailed in Table 5 below.

Table 5. Section 5.1 of SPP 2.5 assessment

Requirement	Response
Community Consultation	Complies. Pre-lodgement consultation outcomes with relevant stakeholders for the proposal are detailed in Appendix C. Community consultation will continue to occur over the course of project delivery.
Environmental Impact	Complies. The proposed development is located within a predominantly cleared area. Minimal clearing of vegetation is required, with no clearing of significant flora species proposed.
Visual Impact	Complies. The proposed development has been determined to have minimal visual impact on the surrounding landscape due to the low-lying design, screening provided by existing vegetation and landscape features and the distance from sensitive receptors and roads.
Noise Impact	Complies. The proposed development has been determined to have minimal noise impacts on the surrounding sensitive receptors.
Heritage	Complies. Review of the Aboriginal Cultural Heritage Inquiry System and InHerit database searches did not identify any Aboriginal or non-Aboriginal heritage places within the subject site. Further, Trina Solar has met with Yamatji Southern Regional Corporation (YSRC) Heritage and Community managers and discussed the project with reference to likely ground disturbance, amongst other matters. Trina Solar is also in the process of settling a Heritage Protection Agreement with YSRC and all matters between the parties are agreed. Trina Solar has also committed to undertake a heritage survey pursuant to that Agreement and has indicated to YSRC that they will progress the project using an 'avoidance' approach should any further ACH be uncovered during the survey.
Construction Impact	Complies. A construction management plan will be prepared to the satisfaction of the Shire at detailed design phase, in accordance with an appropriately worded condition of planning approval. This will assist in addressing construction management and mitigation of associated impacts. The proposed development is located within a previously cleared area and has been designed to avoid areas of native vegetation. Therefore, the proposed development requires minimal clearing of vegetation. The proposed development has been determined to have minimal impact on the surrounding road networks. Management considerations will be implemented as part of the construction management plan.

5.1.7 Government Sewerage Policy

The Government Sewerage Policy sets out the minimum requirements for on-site sewerage disposal. Importantly, the subject site is not within a public drinking source area or a sewerage sensitive area. It is also capable of accommodating on-site sewerage disposal without endangering public health or the environment and the minimum site requirements for on-site sewerage disposal can be met.

5.2 Local Planning Framework

5.2.1 Shire of Three Springs Local Planning Strategy

The Shire has prepared a Local Planning Strategy (LPS) to guide the growth and development of the Shire over the next 10 – 15 years. The LPS sets out a vision for the future and covers key issues such as urban development, rural residential development, tourism, sustainable agriculture, land management, heritage, transport, land management, environment and raw materials.

The LPS vision notes that the Shire will continue to recognise and protect its agricultural resources and rural hinterland through sustainable environmental practices including the management of salinity and the preservation of remnant vegetation. The vision also recognises the growth of the mining and resources industry within the Mid-West region and the key role that the Shire will play in providing infrastructure for industry, particularly in respect to power generation.

The proposed development is wholly consistent with the vision articulated for the Shire in the LPS with respect to power generation.

5.2.2 Shire of Three Springs Local Planning Scheme No.2

The Shire of Three Springs Local Planning Scheme No. 2 (LPS 2) is the primary statutory instrument that controls land use and development within the Shire. The subject site is zoned 'Rural' under the provisions of LPS 2.

The objective of the Rural zone is:

> *"To provide for the sustainable use of land for the agricultural industry and other uses complimentary to sustainable agricultural practices, which are compatible with the capability of the land and retain the rural character and amenity of the locality."*

The proposed development is consistent with the objective of the zone as follows:

- The subject site will continue to be utilised for grazing. The solar array has been designed to facilitate grazing in and around the solar panels to promote weed control.
- The proposed development will not result in off-site impacts that will jeopardise the use of the broader region for agricultural purposes nor the amenity of the area.
- The area of the subject site upon which the development is proposed has been previously cleared for agricultural activities. No significant clearing is proposed which may affect the character or environmental values of the subject site.
- The proposed development will retain the visual amenity and landscape character of the area. It has been assessed as having low visual impact on the rural character of the land given its limited visibility.

The proposed development is defined as a 'renewable energy facility' under the LPS2. A 'renewable energy facility' is defined under the Scheme as:

> *"Premises used to generate energy from a renewable energy source and includes any building or other structure used in, or in connection with, the generation of energy by a renewable resource. It does not include solar panels or a wind turbine located on a lot within a single house where the energy produced only supplies that house or private rural use or anemometers"*

Within the 'Rural' zone, a 'renewable energy facility' as defined in the Use Class Table of the Scheme, as a Category 'A' use. This means that the use is not permitted unless the local government has exercised its discretion by granting development approval after giving notice in accordance with clause 64 of the deemed provisions.

Refer to Figure 5 – LPS2 Zoning

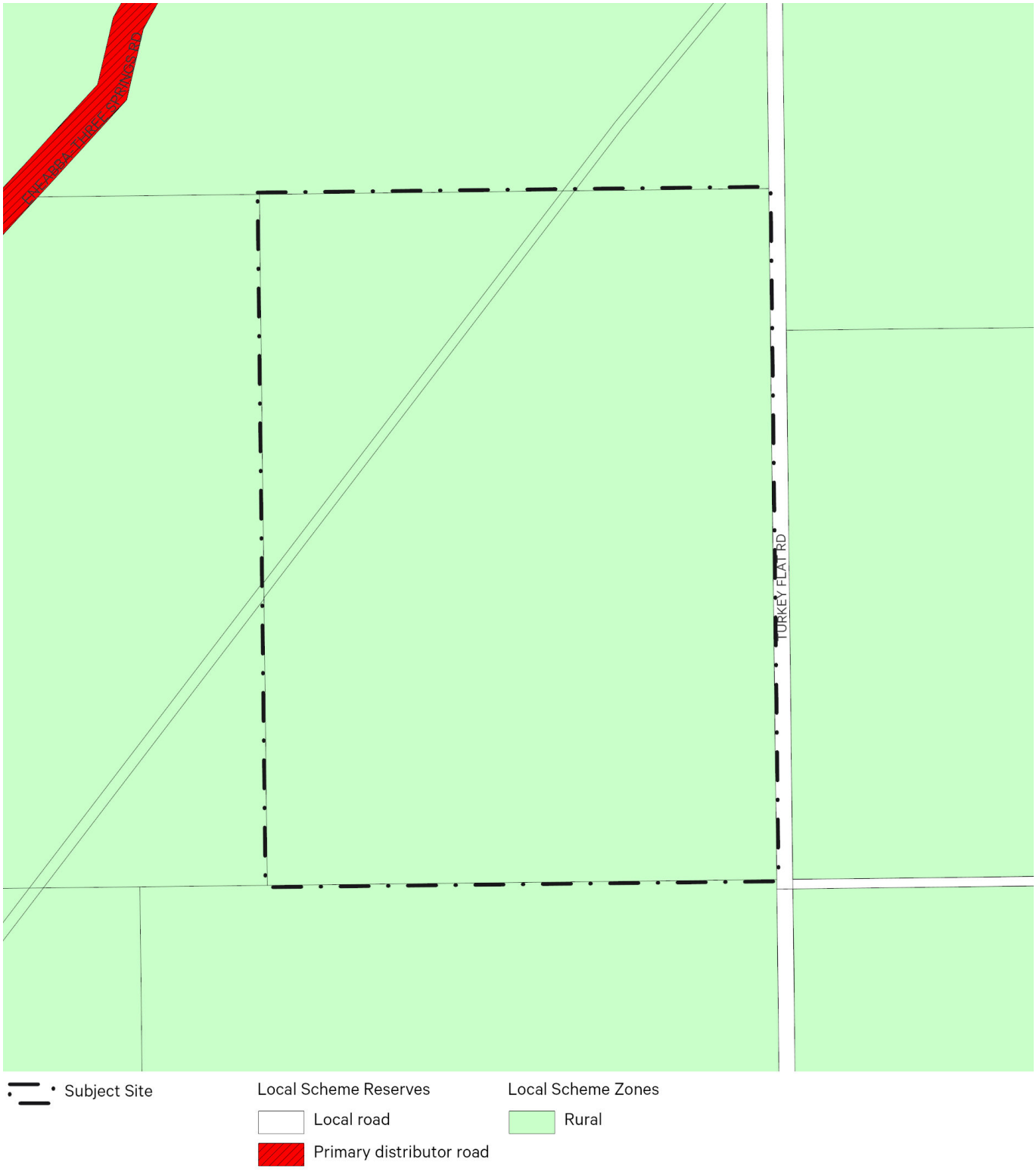


Figure 5 – LPS Zoning Plan

5.2.3 Development Controls

Table 7 of LPS2 sets out the additional site and development requirements that apply to land in the LPS2 area.

In the Rural Zone, there are a number of specific requirements relating to nutrient run-off. These provide that:

> *In considering applications for development approval, the local government:*
>
> *(a) shall ensure that the development proposed will not result in any net export of nutrients from the land to any wetland, watercourse or underground aquifer;*
>
> *(b) may require no further clearing of vegetation;*
>
> *(c) shall prohibit stormwater from draining directly into existing water bodies or watercourses; and*
>
> *(d) may require all stormwater to be disposed of on-site.*

The proposal will be consistent with these requirements; it will not result in the export of nutrients from the subject site and will not result in stormwater draining to water bodies or watercourses.

Table 7 also contains general requirements in relation to:

- development in proximity to water resources and on land prone to the risk of flooding;
- effluent disposal;
- landscaping;
- car parking; and
- vehicle access.

In relation to these matters, it is noted that:

- The subject site is not within an area at risk of flooding and is not in close proximity to a water body.
- Approval for on-site effluent disposal will be sought from the Shire and/or DWER as necessary following the issue of a development approval.
- The majority of the development footprint area is an existing cleared area used for grazing. Significant existing remnant native vegetation is to be retained on the subject site and there is also existing vegetation within the Turkey Flat Road road reserve, all of which contributes to the rural and landscape character of the area and which also provides visual screening for the development. Additional landscaping is not necessitated.
- The proposed development will be predominantly unattended by staff and is not open to visitors, hence specific parking standards and rates are not applicable.
- Unsealed car parking and manoeuvring areas will be available on the subject site for access by maintenance staff.
- Vehicles will enter and exit all parts of the site in a forward gear via access points off Turkey Flat Road.

Schedule 2 or LPS2 identifies development standards that apply to development in the Rural zone. There is no applicable landscape requirement. The applicable setbacks are as follows:

- Front / Street – 20 metres
- Side – 10 metres
- Rear – 20 metres

The design of the development provides boundary setbacks by virtue of the required Non Vegetation Zone (NVZ) and Asset Protection Zones (APZ) required for bushfire protection for the various components of the renewable energy facility where these are located adjacent to the subject site boundaries. These NVZ and APZ requirements include:

- A 10 metre to 15 metre wide NVZ/APZ around the perimeter of the solar panel arrays
- A 10 metre wide NVZ/APZ around the perimeter of the substation
- A 25 metre wide NVZ/APZ around the perimeter of the BESS

Whilst to the Turkey Flat Road 'frontage' of the subject site the required NVZ and APZ is less than the 20 metre setback requirement under LPS2, the wide road reserve of Turkey Flat Road includes a 40 metre wide area of retained remnant vegetation immediately adjacent to the subject site's property boundary. This vegetated area effectively functions as a landscaped front setback thus further setbacks are not considered to be necessary.

6. Orderly and Proper Planning

In addition to the assessment and justification provided in the planning assessment, the principles of orderly and proper planning require that new development is a logical and efficient extension of existing development and is consistent with the planning vision and strategic direction for the locality.

The key points regarding the proposed development are as follows:

- The proposal is consistent with the strategic direction identified for the Shire in the LPS with respect to supporting new energy facilities in the region.
- The proposed development will not compromise the continued use of the subject site for grazing purposes.
- The proposal is predicted to have low visual impact due to its limited visibility due to the screening effects of landforms and vegetation surrounding the subject site. It will therefore have negligible change to visual amenity and landscape character.
- The proposal will not compromise the functionality or amenity of any existing rural dwellings or neighbouring agricultural operations in the vicinity of the subject site.
- The proposal will not compromise the functionality of the existing road network. The proposal will also not generate any noticeable traffic other than during the construction period.
- The proposal provides for a significant new source of renewable energy to assist in meeting the growing electricity needs of WA.
- The proposal has been carefully sited in existing cleared areas of the subject site so as to avoid signigicant clearing of remnant native vegetation.
- The proposal has been designed with a best practice approach to fire risk management.

Given the above, the proposed development is considered to be consistent with the principles of orderly and proper planning and should be supported on its planning merit.

7. Conclusion

This report has been prepared by Element Advisory on behalf of Trina Solar in support of a development application for new renewable energy facility on Lot 10896 Turkey Flat Road, Kadathinni.

This report sets out the development approval framework, project area description, proposed development and planning framework applicable to the proposal.

Based on the planning assessment set out in this report, it is considered that the proposed development will not compromise the strategic intent for the area and is consistent with development standards and requirements in the applicable statutory planning framework.

In conclusion, the proposed development provides for a significant new renewable energy facility to assist in meeting the growing electricity needs of WA and the state government's green energy transformation policy.

It will not impact on the landscape, the sustainable and ongoing agricultural use of the subject site or the site's environmental qualities. It is also designed to appropriately manage bushfire risks.

The proposed development is demonstrably consistent with the principles of orderly and proper planning. Accordingly, it is respectfully requested that the Shire support and recommend approval of the proposed development to the RDAP, subject to appropriate and reasonable conditions.

Appendices

Appendix A – Certificates of Title

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1556	**965**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 10896 ON DEPOSITED PLAN 210818

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

EXTENSION HILL PTY LTD OF POST OFFICE BOX 82, WEST PERTH

(T K561523) REGISTERED 9/4/2008

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. G732722 MEMORIAL. SOIL AND LAND CONSERVATION ACT 1945 EXPIRING 1.6.2024. AS TO PORTION ONLY. REGISTERED 9/3/1998.
2. O297838 NOTICE OF INTENTION TO TAKE FOR THE DESIGNATED PURPOSE OF A 330KV ELECTRICITY TRANSMISSION LINE AND ASSOCIATED INFRASTRUCTURE AS TO AN INTEREST REQUIRED FOR AN EASEMENT ONLY. AS TO PORTION ONLY REGISTERED 5/12/2019.
3. O419993 TAKING ORDER. THE DESIGNATED PURPOSE OF THE INTEREST TAKEN FOR AN EASEMENT IS A 330KV ELECTRICITY TRANSMISSION LINE AND ASSOCIATED INFRASTRUCTURE. AS TO THE PORTION SHOWN ON DEPOSITED PLAN 416017 ONLY. REGISTERED 4/6/2020.
4. O419993 EASEMENT TO ELECTRICITY NETWORKS CORPORATION FOR A 330KV ELECTRICITY TRANSMISSION LINE AND ASSOCIATED INFRASTRUCTURE PURPOSES. SEE DEPOSITED PLAN 416017. REGISTERED 4/6/2020.
5. Q310737 CAVEAT BY TRINA PROJECTS HOLDING AUSTRALIA PTY LTD AS TO PORTION ONLY LODGED 11/2/2025.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1556-965 (10896/DP210818)
PREVIOUS TITLE: 1556-965

END OF PAGE 1 - CONTINUED OVER

LANDGATE COPY OF ORIGINAL NOT TO SCALE 26/03/2025 12:22 PM Request number: 67977837

Landgate
www.landgate.wa.gov.au

PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY: SHIRE OF THREE SPRINGS

NOTE 1: M630403 DEPOSITED PLAN (INTEREST ONLY) 401487 LODGED.

LANDGATE COPY OF ORIGINAL NOT TO SCALE 26/03/2025 12:22 PM Request number: 67977837

Landgate
www.landgate.wa.gov.au

ORIGINAL — NOT TO BE REMOVED FROM OFFICE OF T

CT 1556 0965 F

LANDS Entered | L.T.O. Land Permit Lease 19 Name

4.50 6.88 11.38

WESTERN AUSTRALIA

Crown Grant

VOL. 1556 FOL. 965

Page 1 (of 2 pages) VOL. 1556 FOL. 965

6/11/82 PAID $11.38 2285

Elizabeth the Second, by the Grace of God, Queen of Australia and Her other Realms and Territories, Head of the Commonwealth. To all to whom these Presents shall come, GREETING: Know Ye that We, of Our especial Grace, certain knowledge, and mere motion, have given and granted, and We do by these Presents, for Us, Our heirs and successors, in consideration of the payment of the sum of $3298.70-------- and the fulfilment of the prescribed conditions to the satisfaction of Our Governor of Our State of Western Australia, Give and Grant unto Patrick Joseph O'Brien of Albert Street

Miners Rest in the State of Victoria formerly of Three Springs Farmer

(hereinafter called the Grantee), the natural surface and so much of the land as is below the natural surface to a depth of 12.19 metres of ALL THAT Tract or Parcel of Land situate and being in the District of Victoria----------, in Our said State, containing 1405.2001 hectares---------- more or less, and marked and distinguished in the Maps and Books of the Department of Lands and Surveys of Our said State as Victoria Location 10896-- and as the same is delineated and coloured green in the plan in the first schedule: TOGETHER with all Appurtenances whatsoever thereunto belonging, or in anywise appertaining: TO HAVE AND TO HOLD the said Tract or Parcel of Land to the depth aforesaid, and all and singular the Premises hereby granted, with their appurtenances, unto the said Grantee, in fee simple: YIELDING AND PAYING for the same to Us, Our heirs and successors, one peppercorn of yearly rent on the twenty-fifth day of March in each year, or so soon thereafter as the same shall be lawfully demanded: PROVIDED, NEVERTHELESS, that, subject to section 141 of the Land Act, 1933, it shall be lawful for Us, Our heirs and successors, or for any person or persons acting in that behalf by Our or their authority, to resume and enter upon possession of any part of the said land which it may at any time by Us, Our heirs and successors, be deemed necessary to resume for roads, tramways, railways, railway stations, bridges, canals, towing-paths, harbour or river improvement works, drainage, or irrigation works, or quarries, and generally for any other works or purposes of public use, utility, or convenience, and for the purpose of exercising the power to search for minerals hereinafter reserved, and such land so resumed to hold to Us, Our heirs and successors, as of Our or their former estate without making to the said Grantee, or any person lawfully claiming under him, any compensation in respect thereof, so nevertheless, that the land so to be resumed shall not exceed one-twentieth part in the whole of the lands aforesaid, and that no such resumption be made of the part of any lands upon which any buildings may have been erected, or which may be in use as gardens, or otherwise, for the more convenient occupation of any such buildings, or on which any other improvements as defined by the Land Act, 1933, have been made, without compensation: AND PROVIDED, ALSO, that it shall be lawful at all times for Us, Our heirs and successors, or for any person or persons acting in that behalf, by Our or their authority, to search and dig for and carry away any stones or other materials which may be required for making or keeping in repair any roads, tramways, railways, railway stations, bridges, canals, towing-paths, harbour works, breakwaters, river improvements, drainage or irrigation works, and generally for any other works or purposes of public use, utility, or convenience, without making to the said Grantee, or any person claiming under him, any compensation in respect thereof, and We do hereby save and reserve to Us, Our heirs and successors, all Mines, of Gold, Silver, Copper, Tin, or other Metals, Ore, and Minerals, or other substances containing Metals, and all Gems or Precious Stones and Coal or Mineral Oil and all Phosphatic Substances in and under the said land, with full liberty at all times to search and dig for and carry away the same; and for that purpose to enter upon the said land or any part thereof: and we do hereby, save and reserve to Us, Our heirs and successors all petroleum (as defined in the Petroleum Act, 1967, and all amendments thereof for the time being in force) on or below the surface of the said land with the right reserved to Us, Our heirs and successors and persons authorised by Us, Our heirs and successors to have access to the said land for the purpose of searching for and for the operations of obtaining petroleum in any part of the said land subject to and in accordance with the provisions contained in the Petroleum Act, 1967, and all amendments thereof for the time being in force.

IN WITNESS whereof We have caused Our trusty and well-beloved HIS EXCELLENCY AIR CHIEF MARSHAL SIR WALLACE KYLE, Knight Grand Cross of the Most Honourable Order of the Bath, Knight Commander of the Royal Victorian Order, Commander of the Most Excellent Order of the British Empire, Companion of the Distinguished Service Order, Distinguished Flying Cross, Knight of Grace of the Most Venerable Order of the Hospital of St. John of Jerusalem, Governor in and over the State of Western Australia and its Dependencies in the Commonwealth of Australia, to affix to these Presents the Public Seal of the said State.

Sealed this 14th *day of* February, *One thousand nine hundred and* eighty

Wallace Kyle
Governor

Grant under the Land Act, 1933 as amended

David Wadsworth
Minister for Lands.

CERTIFICATE OF TITLE

UNDER THE "TRANSFER OF LAND ACT, 1893" AS AMENDED

The abovenamed Grantee is now the registered proprietor of an estate in fee simple in all the land described in this Grant subject to the easements and encumbrances shown in the Second Schedule hereto.

DATED THE 6th DAY OF March 1980

L. Broughton
REGISTRAR OF TITLES

OFFICE OF TITLES WESTERN AUSTRALIA

Transfer D515124 to Nigel Clarke Hunt and Hedley Nathan Hunt, both of Three Springs, Farmers, as tenants in common in equal shares. Registered 10th July 1987 at 2.26 o'c.

OFFICE OF TITLES Western Australia

FOR ENCUMBRANCES AND OTHER MATTERS AFFECTING THE LAND SEE SECOND SCHEDULE

41435/9/74—4M—O/CH

Superseded - Copy for Sketch Only

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

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Superseded - Copy for Sketch Only

FIRST SCHEDULE

Area and measurements on the Plan hereon are more or less, and a peg has been placed at each corner of the location.

All measurements in Metric Units

Scale: 1:60000

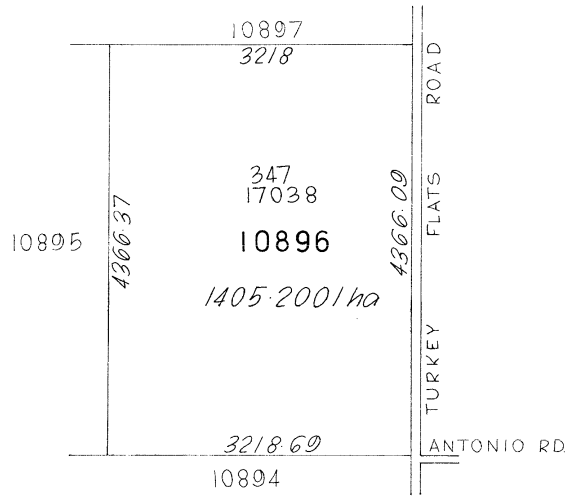
Survey: O.P. 10818

Surveyed: by F.R. Rodda

Corr: 2469/67 Vol. 2

Drawn: RS

Examined:



SURVEYOR GENERAL.

197 / 1969

SECOND SCHEDULE

NOTE: RULING THROUGH AND SEALING WITH THE OFFICE SEAL INDICATES THAT AN ENTRY NO LONGER HAS EFFECT. ENTRIES NOT RULED THROUGH MAY BE AFFECTED BY SUBSEQUENT ENDORSEMENTS.

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	TIME	SEAL	INITIALS	CANCELLATION	NUMBER	REGISTERED OR LODGED	SEAL	INITIALS
~~Mortgage~~	~~A721222~~	~~to John Bevan Hawthorn, of Canna, Sharefarmer.~~	~~11.9.73~~	~~10.03~~			Discharged	B995838	23.9.80		
~~Mortgage~~	~~C280365~~	~~to Esanda Limited~~	~~31.12.84~~	~~9.10~~			Discharged	D515123	10.7.87		
~~Caveat~~	D54741	Lodged 28.6.1985 at 10.44 o'c.					Withdrawn	D107092	10.9.85		
Memorial	G732722	As to Portion only: Soil & Land Conservation Act 1945. Expiring 1.6.2024.	9.3.98	14.17							

CERTIFICATE OF TITLE VOL. 1556 965

Appendix B – Technical Drawings

SYSTEM SPECIFICATION (AC COUPLED)

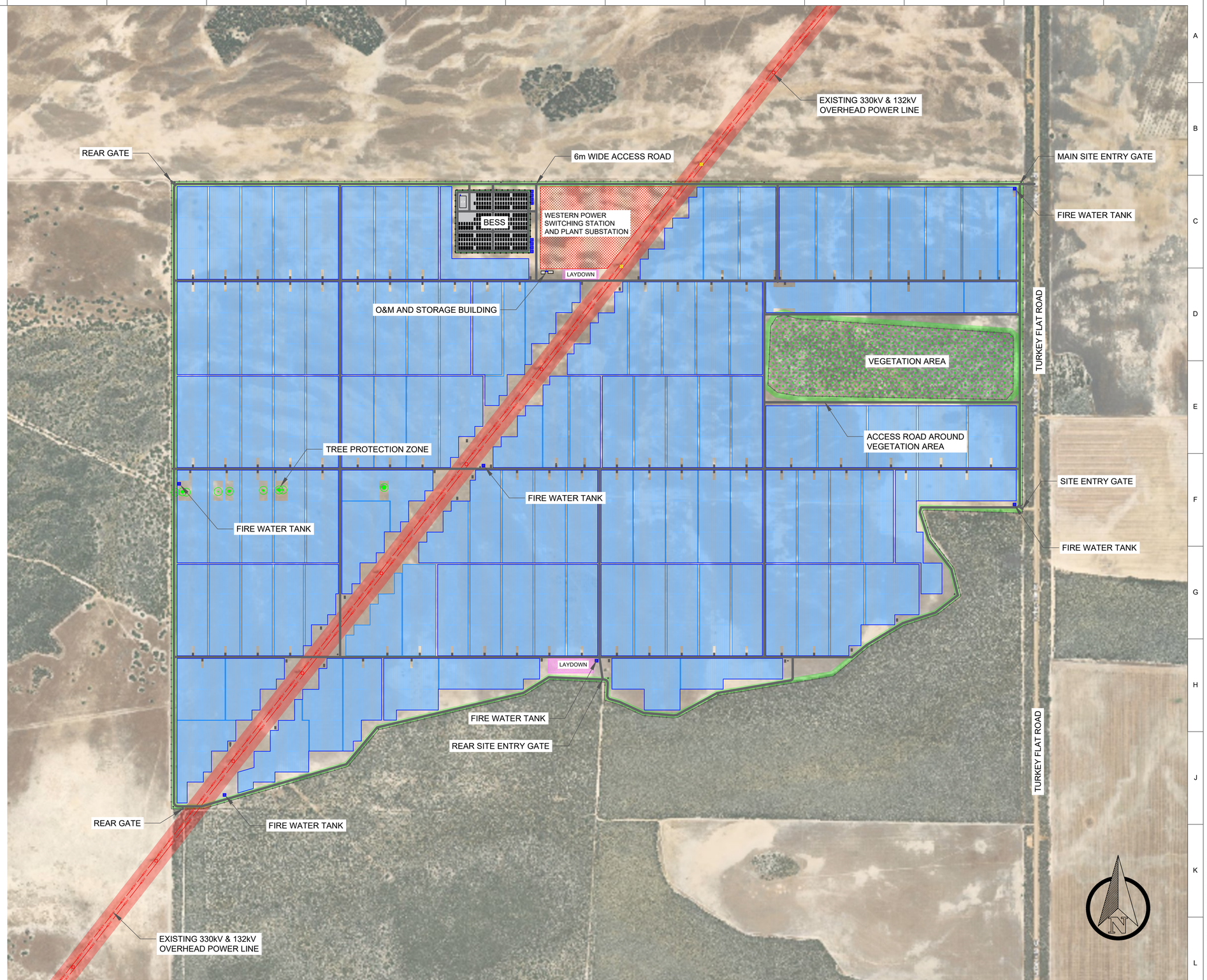
GRID CONNECTION VOLTAGE	330kV SINGLE/DOUBLE CIRCUIT(S)
POC CAPACITY	400 MW
BESS CAPACITY (25°C)	2072~2527 MWh
CHARGING/DISCHARGING HOURS	4 HOURS
BESS INVERTER MAX POWER (40°C)	529.2 MVA
BESS INVERTER STATION	PE PCSM FP4203MH4
No. INVERTER / MV STATION	126
BESS MODEL	BESS CONTAINER
No. BESS CONTAINER	504
PV CAPACITY (STC)	480 MWp / 400 MWac
PV MODULE	TSM-NEG21C.20 720Wp
STRING SIZE	28
84 MODULES TRACKERS	7718
56 MODULES TRACKERS	653
TRACKER	SINGLE AXIS TRACKING
PITCH	5.1 METERS
PV INVERTER MAX POWER (40°C)	478.8 MVA
PV INVERTER STATION	PE HEM FS4202MH
No. INVERTER / MV STATION	114
SITE AREA	624.2 Ha
RESERVED VEGETATION AREA	24.96 Ha
SUBSTATION AREA	11.5 Ha
BESS AREA	6.7 Ha
SITE FENCE	13,210 METERS
INTERNAL ACCESS ROAD	26,034 METERS

NOTES

1. THIS LAYOUT IS FOR PLANNING PURPOSE ONLY SUBJECT TO CHANGE.
2. SUBSTATION, INVERTER, BESS, PV LOCATION TO BE CONFIRMED.
3. GRID CONNECTION POINT AND ARRANGEMENT TO BE CONFIRMED.
4. 20 METERS WIDE SITE FIRE BREAK CLEARANCE PERIMETER BUFFER.
5. 6 METERS WIDE INTERNAL UNSEALED OR SEALED ROAD.
6. SITE ENTRY AND ACCESS ROAD TO BE CONFIRMED.
7. SOLAR FARM AND BESS CAPACITY AND OPTIONS TO BE CONFIRMED.

LEGEND

- INTERNAL PERIMETER CLEARANCE AND FIRE BREAK BUFFER
- POWER LINE EASEMENT BUFFER
- INVERTER STATION
- BATTERY CONTAINER
- SITE BOUNDARY PERIMETER FENCE
- LAND BOUNDARY FENCE
- INTERNAL SEALED OR UNSEALED ROAD
- BESS FOUNDATION AREA
- OVERHEAD POWER LINE
- RESERVED VEGETATION AREA
- METEOROLOGICAL STATION
- CCTV SURVEILLANCE CAMERA
- FIRE WATER TANK FOR PV ARRAY, BESS, AND BUILDINGS



CLIENT
TRINA SOLAR

PROJECT
TATHRA PV BESS PLANT

TURKEY FLAT ROAD, KADATHINNI, WA 6519
-29.674897, 115.594014

CHECK	
DESIGNER	WILSON JIN
DRAFTER	WILSON JIN
PROJECT MANAGER	EDWARD WANG
PROJECT DIRECTOR	JOSE FLORES

REVISION	DATE	CHECKED BY	APPROVED BY
1.0 INITIAL DRAFT	2023/11/29	-	-
2.0 LAYOUT UPDATE	2024/04/30	-	-
3.0AAC COUPLED BESS UPDATE	2025/03/07	-	-
- -	-	-	-
- -	-	-	-
- -	-	-	-
- -	-	-	-

PRELIMINARY NOT FOR CONSTRUCTION

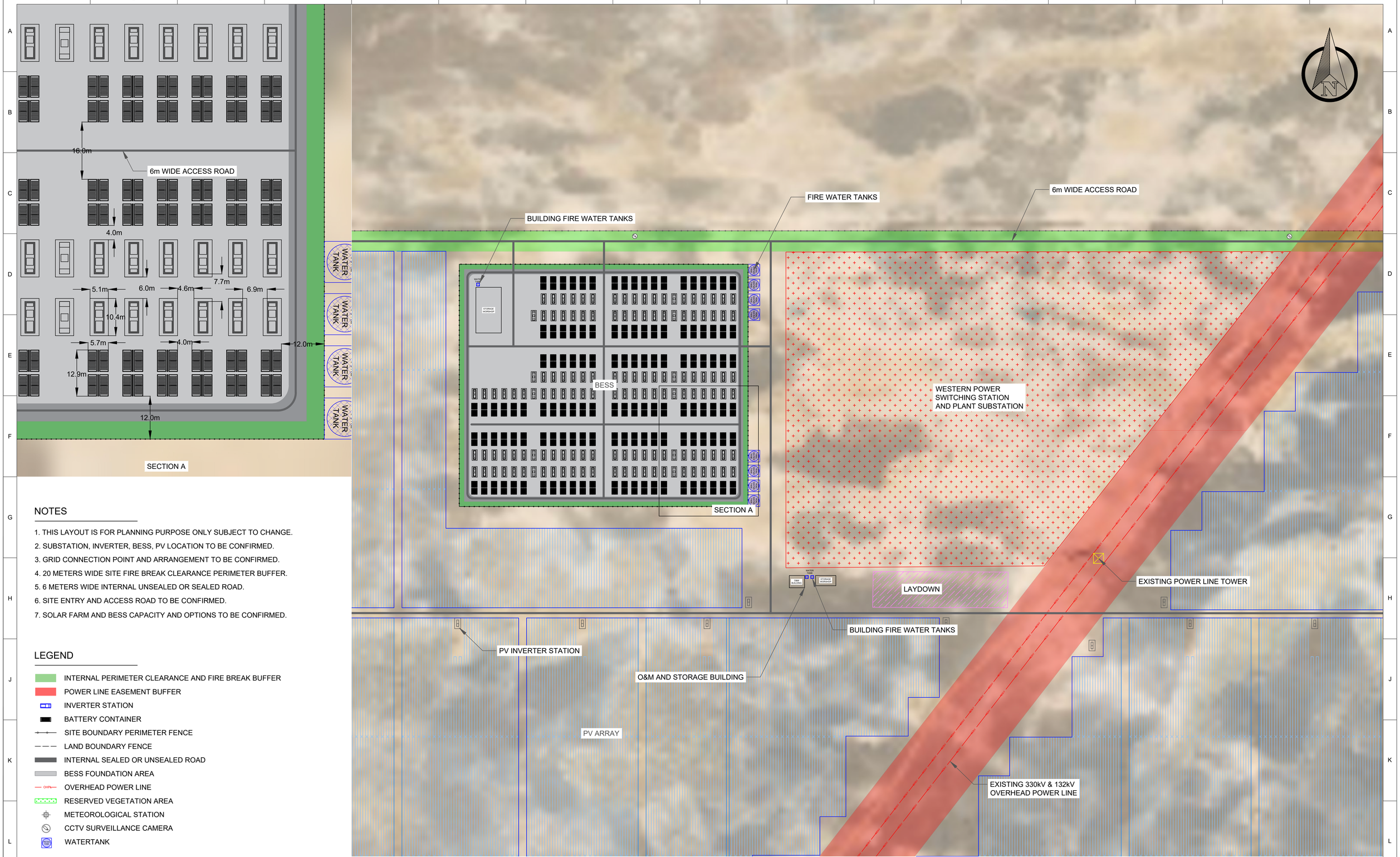
TITLE
SOLAR FARM OVERVIEW

DRAWING NUMBER	REVISION	PAGE
TRN-THSP-GN-DWG-001	3.0A	1 / 2

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A1 841 x 594

CAD



NOTES

1. THIS LAYOUT IS FOR PLANNING PURPOSE ONLY SUBJECT TO CHANGE.
2. SUBSTATION, INVERTER, BESS, PV LOCATION TO BE CONFIRMED.
3. GRID CONNECTION POINT AND ARRANGEMENT TO BE CONFIRMED.
4. 20 METERS WIDE SITE FIRE BREAK CLEARANCE PERIMETER BUFFER.
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6. SITE ENTRY AND ACCESS ROAD TO BE CONFIRMED.
7. SOLAR FARM AND BESS CAPACITY AND OPTIONS TO BE CONFIRMED.

LEGEND

- INTERNAL PERIMETER CLEARANCE AND FIRE BREAK BUFFER
- POWER LINE EASEMENT BUFFER
- INVERTER STATION
- BATTERY CONTAINER
- SITE BOUNDARY PERIMETER FENCE
- LAND BOUNDARY FENCE
- INTERNAL SEALED OR UNSEALED ROAD
- BESS FOUNDATION AREA
- OVERHEAD POWER LINE
- RESERVED VEGETATION AREA
- METEOROLOGICAL STATION
- CCTV SURVEILLANCE CAMERA
- WATERTANK

CLIENT

TRINA SOLAR

PROJECT

TATHRA PV BESS PLANT

TURKEY FLAT ROAD, KADATHINNI, WA 6519
-29.674897, 115.594014

CHECK	
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DRAFTER	WILSON JIN
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REVISION	DATE	CHECKED BY	APPROVED BY
1.0 INITIAL DRAFT	2023/11/29	-	-
2.0 LAYOUT UPDATE	2024/04/30	-	-
3.0AAC COUPLED BESS UPDATE	2025/03/07	-	-
- -	-	-	-
- -	-	-	-
- -	-	-	-
- -	-	-	-

PRELIMINARY NOT FOR CONSTRUCTION

TITLE

SUBSTATION AND BESS PLAN

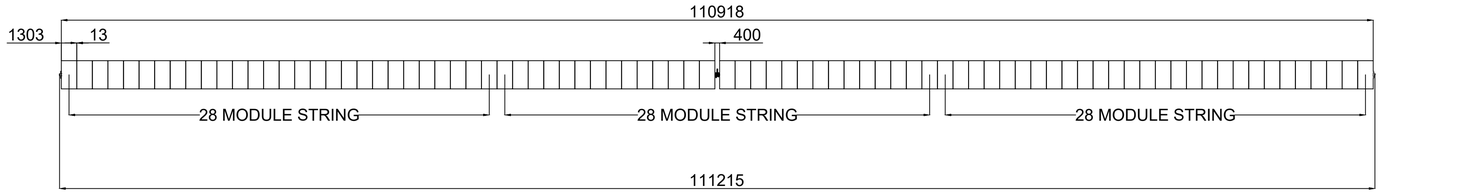
DRAWING NUMBER	REVISION	PAGE
TRN-THSP-GN-DWG-001	3.0A	2 / 2

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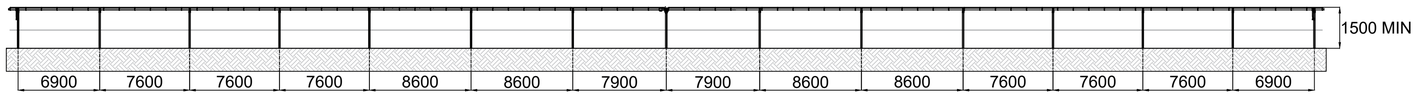
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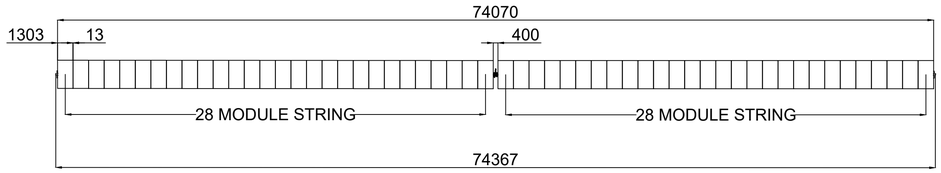
1 TOP VIEW
VANGUARD 1Px84



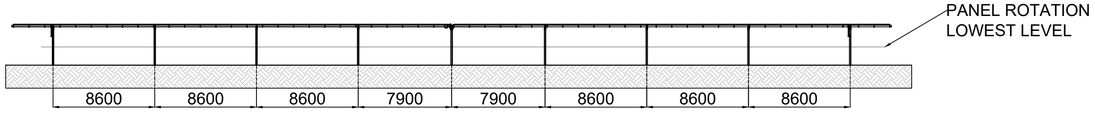
2 FRONT VIEW
1Px84 OUTER TRACKER



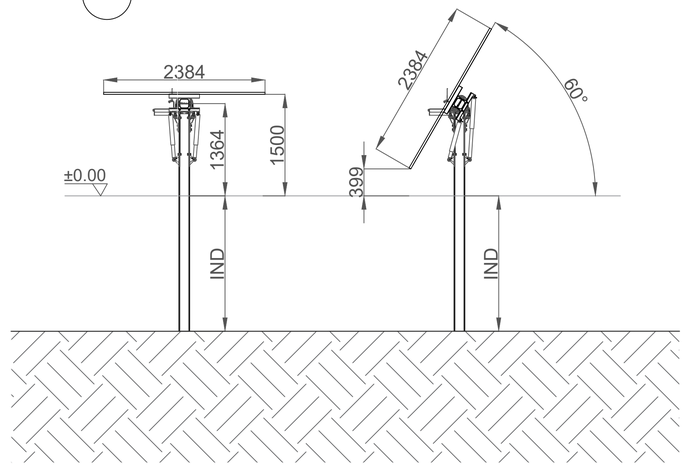
3 TOP VIEW
VANGUARD 1Px56



4 FRONT VIEW
1Px56 OUTER TRACKER



5 PROFILE VIEW



SYSTEM SPECIFICATION

TRACKER MODEL	TRINA VANGUARD 1P
TILT	± 60deg
DRIVE UNIT	SLEWING DRIVE
MODULE	TSM-NEG21C.20
MODULE POWER	710/715Wp
MODULE DIMENSION	2384x1303x30mm
TRACKERS MODULES	56 AND 84
STRING SIZE	28
TRACKER PILES 84 MODULE ROW	OUTER 15 PILES
TRACKER PIELS 56 MODULE ROW	OUTER 9 PILES
RAMMING LENGTH	TBC AFTER PULL-OUT TEST
MAXIMUM GROUND SLOPE	5% N-S AND 5% E-W

LEGEND

SOLID GROUND (COMPACTED SOIL)

NOTES

1. THIS DRAWING IS FOR PLANNING PURPOSE ONLY AND DESIGN TO BE CONFIRMED IN DETAIL DESIGN STAGE.
2. THIS DRAWING IS INDICATIVE OUTER TRACKER SIZE. TRACKER INNER AND BORDER ROWS ARE NOT SHOWN.
3. SINGLE-AXIS TRACKING SYSTEM CONFIGURATION AND DIMENSION SUBJECT TO CHANGE BASED ON FINAL DETAIL DESIGN.
4. GROUND SLOPE TO BE CONFIRMED DURING CONSTRUCTION PERIOD.
5. TRACKER PLANE SHOULD MATCH THE AVERAGE GROUND SLOPE ACROSS THE TRACKER. THE MOTOR AND BHA BRACKETS SHOULD BE SET TO THIS SLOPE TO MOUNT THE SLEW GEAR AND BHAS PROPERLY.
6. WEATHER STATION IS FOR TRACKER TO BE CONFIRMED DURING DETAIL DESIGN PERIOD.
7. TRACKER PILING DEPTH AND METHODOLOGY TO BE DETERMINED BASED ON DETAIL SITE GROUND SURVEY DURING CONSTRUCTION PERIOD.
8. MAXIMUM TRACKER INSTALLATION HEIGHT AND PANEL MOUNT LEVEL TO BE CONFIRMED DURING DETAIL DESIGN AND CONSTRUCTION PERIOD.
9. DIMENSIONS IN MILLIMETERS (mm)

CLIENT
TRINA SOLAR

PROJECT
THREE SPRINGS PV BESS PLANT
TURKEY FLAT ROAD, KADATHINNI, WA 6519
-29.674897, 115.594014

REVISION	DATE	DESIGNED BY	DRAFT BY	CHECKED BY	APPROVED BY
1.0 INITIAL DRAFT	2025/01/13	WILSON JIN	WILSON JIN	RALF JIANG	RALF JIANG

PRELIMINARY NOT FOR CONSTRUCTION

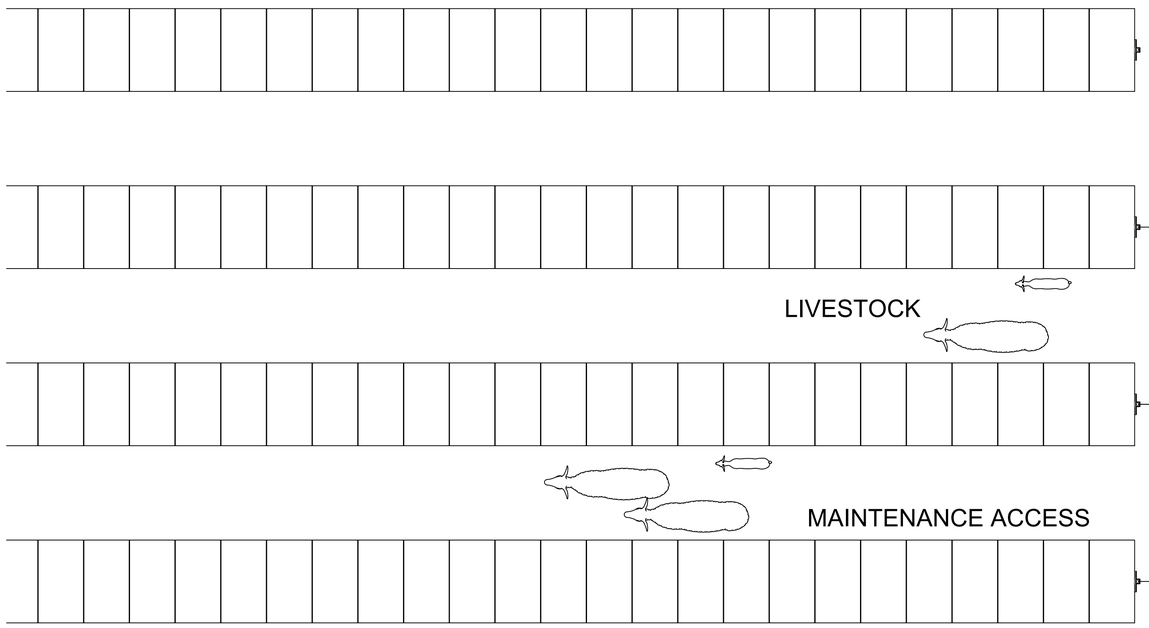
TITLE
TRACKING SYSTEM ELEVATION

DRAWING NUMBER	REVISION	PAGE
TRN-THSP-GN-DWG-002	1.0	1 / 2

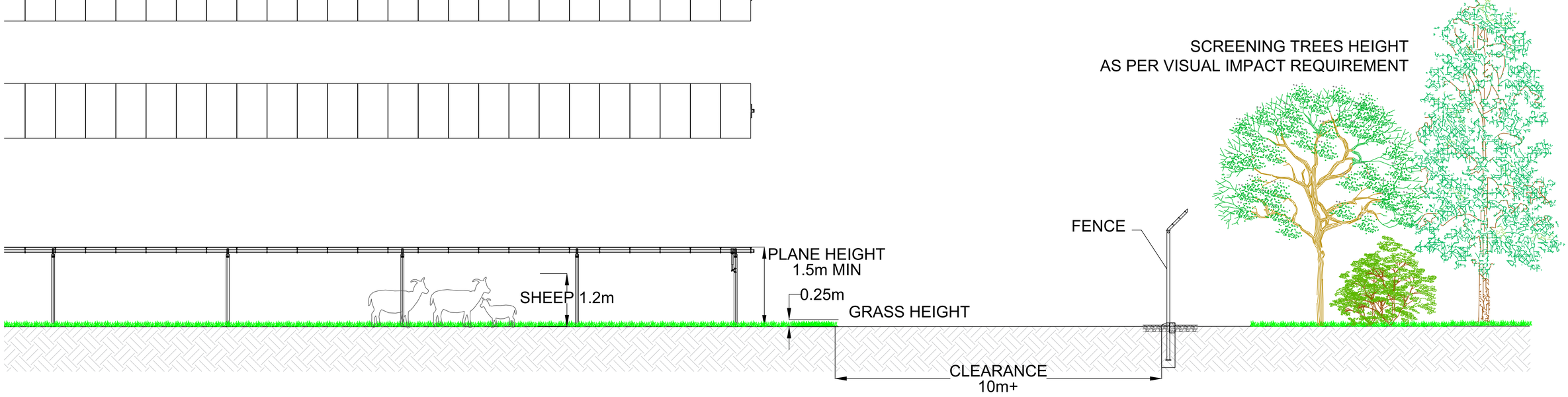
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1 **TRACKER ARRAY TOP VIEW**



2 **TRACKER ARRAY SIDE VIEW**

CLIENT
TRINA SOLAR

PROJECT
THREE SPRINGS PV BESS PLANT
TURKEY FLAT ROAD, KADATHINNI, WA 6519
-29.674897, 115.594014

REVISION	DATE	DESIGNED BY	DRAFT BY	CHECKED BY	APPROVED BY
1.0 INITIAL DRAFT	2025/01/13	WILSON JIN	WILSON JIN	RALF JIANG	RALF JIANG

PRELIMINARY NOT FOR CONSTRUCTION

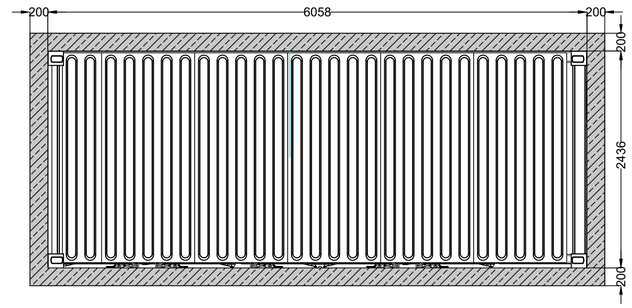
TITLE
GRAZING AND LIVESTOCK DIAGRAM

DRAWING NUMBER	REVISION	PAGE
TRN-THSP-GN-DWG-002	1.0	2 / 2

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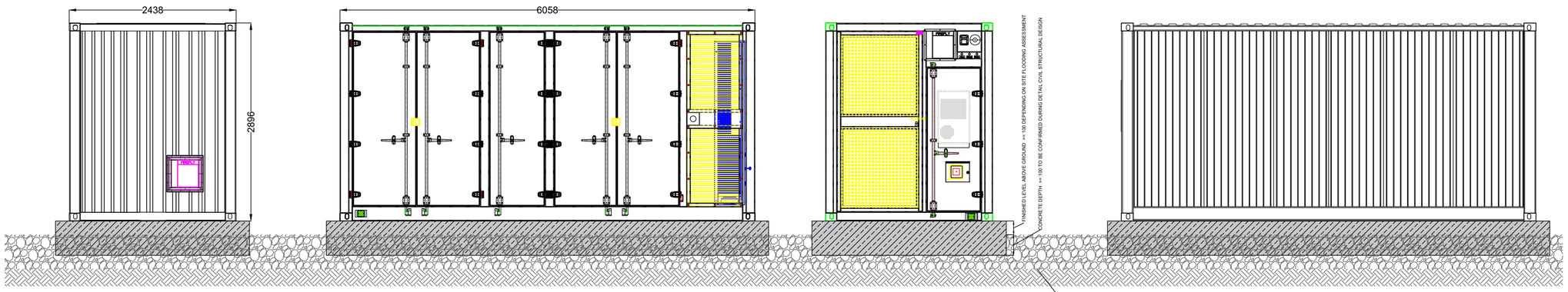
4 ROOF VIEW

LEGEND

- GRAVEL GROUND
- SOLID GROUND (COMPACTED SOIL)
- CONCRETE FOUNDATION

NOTES

1. MOUNTING OPTION WITH CONCRETE FOUNDATIONS
2. FOUNDATIONS MUST BE SUITABLE FOR WEIGHT OF PRODUCT
3. FOUNDATIONS MUST BE PLACED ON SOLID GROUND
4. FOUNDATIONS SIZE TO BE DETERMINED BY FLOODING ASSESSMENT AND GROUND CONDITIONS
5. ACTUAL ELEVATION AND FOUNDATIONS TO BE DETERMINED DURING DETAIL DESIGN PERIOD
6. EACH BATTERY CABINET ESTIMATED WEIGHT TO BE CONFIRMED DURING PROCUREMENT
7. DIMENSIONS IN MILLIMETERS (mm)
8. THIS FOUNDATION IS INDICATIVE ONLY AND SUBJECT TO CHANGE AS PER SITE CONDITIONS

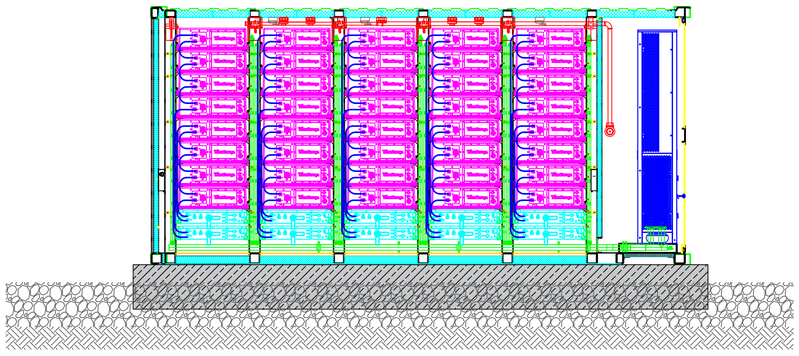


2 SIDE VIEW

1 FRONT VIEW DOOR CLOSED

3 SIDE VIEW

5 REAR VIEW



6 FRONT VIEW DOOR OPEN

CLIENT	PROJECT
TRINA SOLAR	**THREE SPRINGS PV BESS PLANT**
Trinasolar	TURKEY FLAT ROAD, KADATHINNI, WA 6519 -29.674897, 115.594014

REVISION	DATE	DESIGNED BY	DRAFT BY	CHECKED BY	APPROVED BY
1.0 INITIAL DRAFT	2025/01/13	WILSON JIN	WILSON JIN	RALF JIANG	RALF JIANG
- -	-	-		-	
- -	-	-		-	
- -	-	-		-	
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- -	-	-		-	
- -	-	-		-	

TITLE

PRELIMINARY NOT FOR CONSTRUCTION

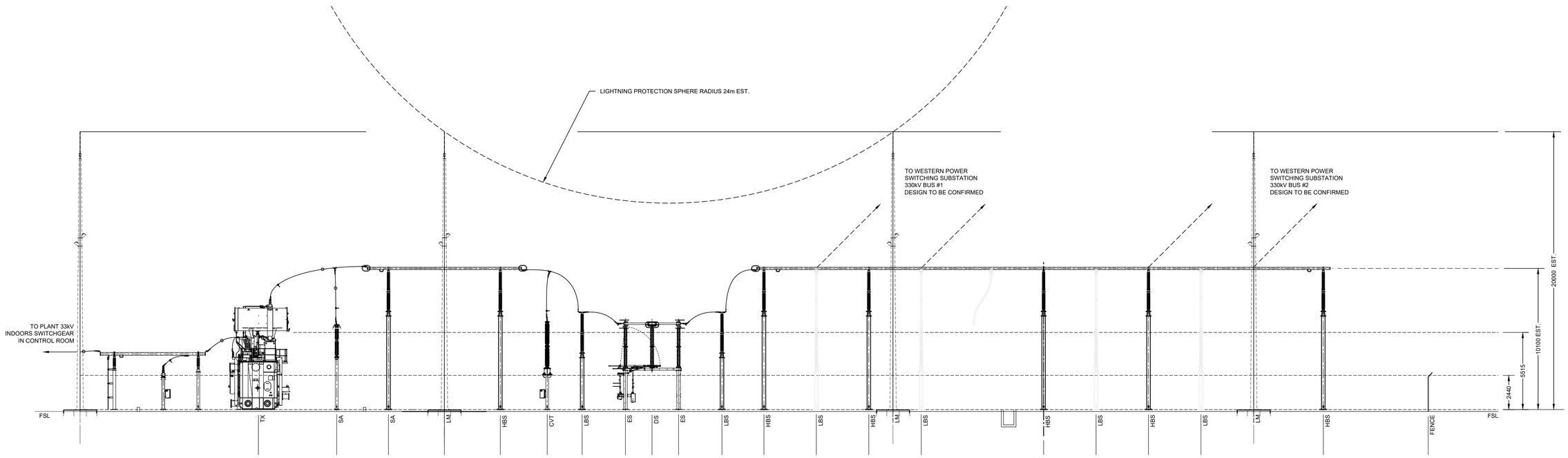
GENERIC BATTERY CONTAINER ELEVATION

DRAWING NUMBER	REVISION	PAGE
TRN-THSP-GN-DWG-004	1.0	1 / 1

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NOTES

1. THIS SUBSTATION ARRANGEMENT IS INDICATIVE FOR PLANNING PURPOSE TO SHOW ELEVATION ONLY, AND IS SUBJECT TO FINAL SUBSTATION DESIGN.
2. SUBSTATION EQUIPMENT CONFIGURATION, CLEARANCE AND ELEVATION TO BE CONFIRMED IN DETAIL DESIGN STAGE.
3. ALL DIMENSIONS IN MILLIMETRES (mm) UNLESS SPECIFIED OTHERWISE.
4. WESTERN POWER SWITCHING SUBSTATION DESIGN TO BE CONFIRMED LATER STAGE AND NOT SHOWN IN THIS DIAGRAM.
5. THE DISCONNECTOR / EARTH SWITCH AT 330kV BUS MAY BE CHANGED TO CIRCUIT BREAKER AFTER DETAILED DESIGN.

CLIENT
TRINA SOLAR

PROJECT
THREE SPRINGS PV BESS PLANT
TURKEY FLAT ROAD, KADATHINNI, WA 6519
-29.674897, 115.594014

REVISION	DATE	DESIGNED BY	DRAFT BY	CHECKED BY	APPROVED BY
1.0 INITIAL DRAFT	2025/01/13	WILSON JIN	WILSON JIN	RALF JIANG	RALF JIANG
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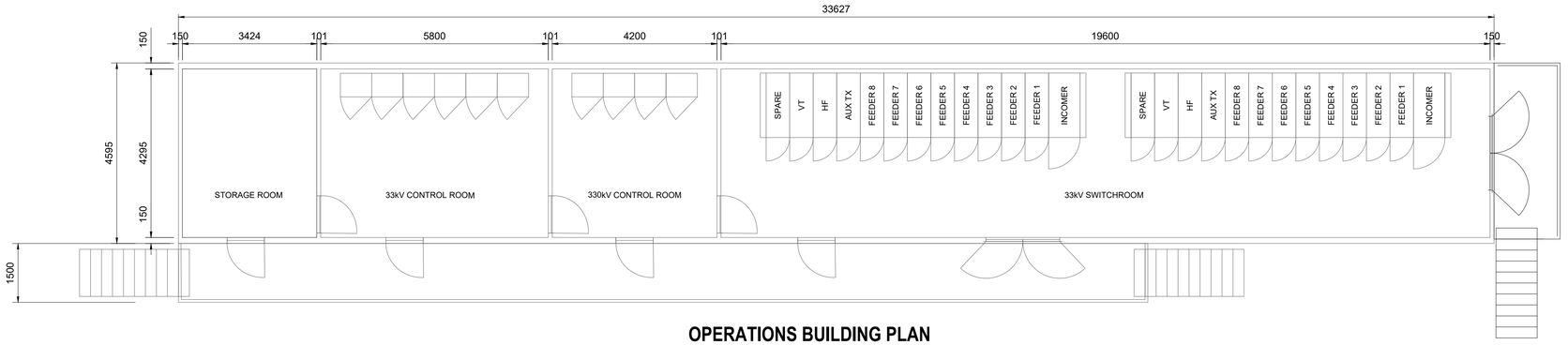
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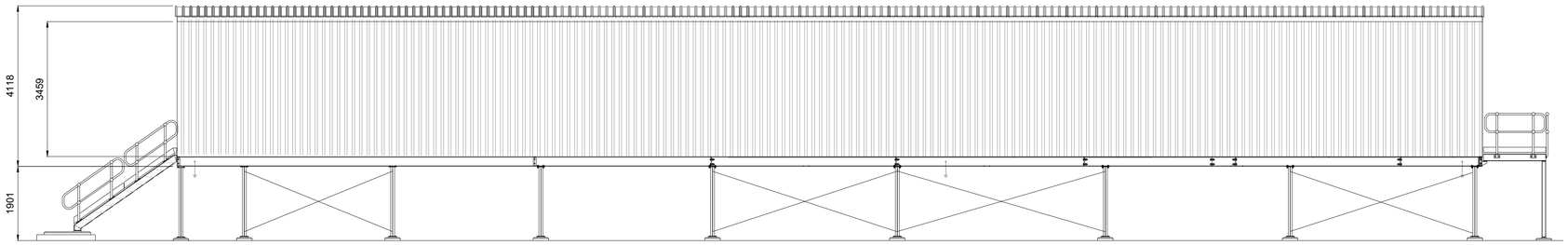
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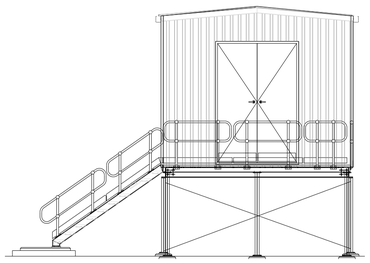
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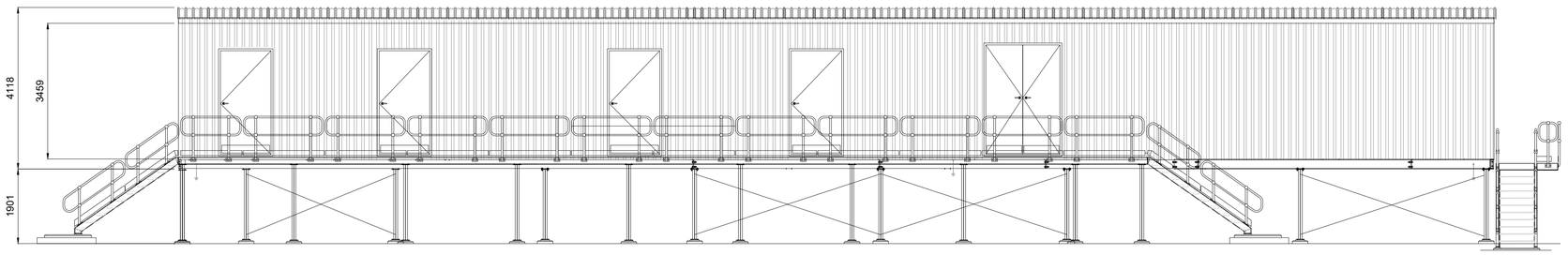
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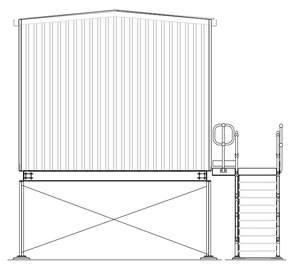
BACK VIEW



SIDE VIEW (RIGHT)



FRONT VIEW



SIDE VIEW (LEFT)

CLIENT

TRINA SOLAR

PROJECT

THREE SPRINGS PV BESS PLANT

TURKEY FLAT ROAD, KADATHINNI, WA 6519
-29.674897, 115.594014

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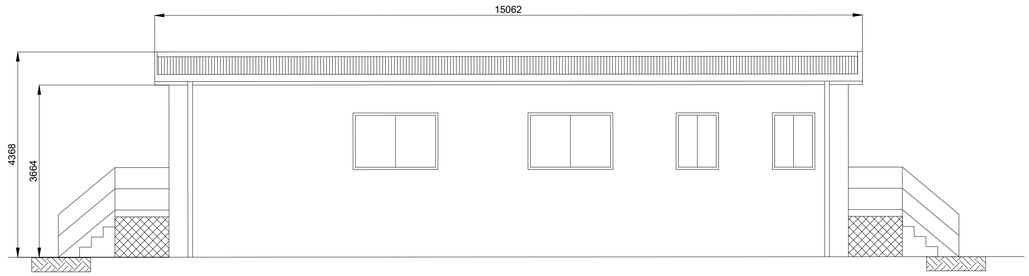
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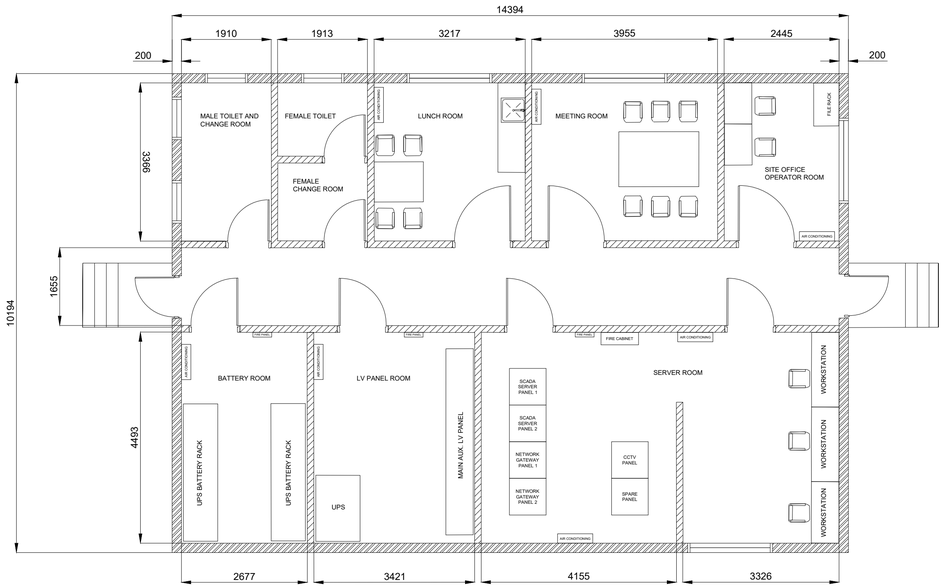
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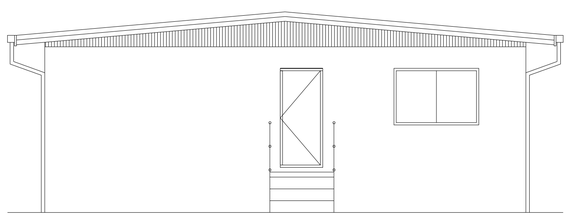
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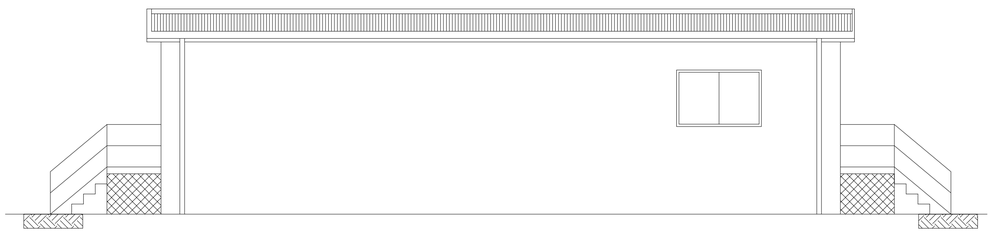
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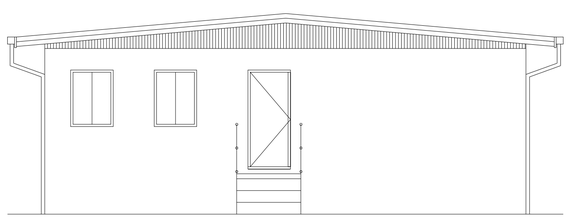
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EAST VIEW



FRONT VIEW



WEST VIEW

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THREE SPRINGS PV BESS PLANT

TURKEY FLAT ROAD, KADATHINNI, WA 6519
-29.674897, 115.594014

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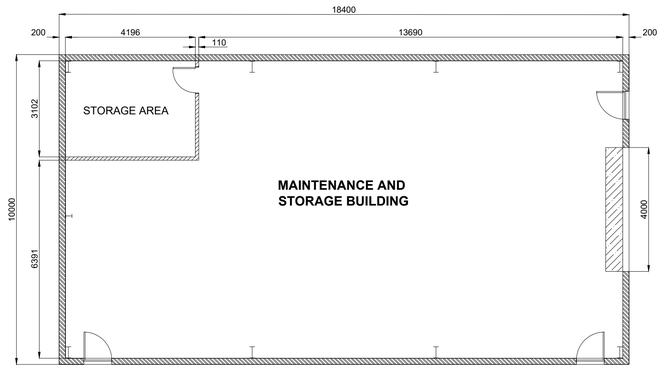
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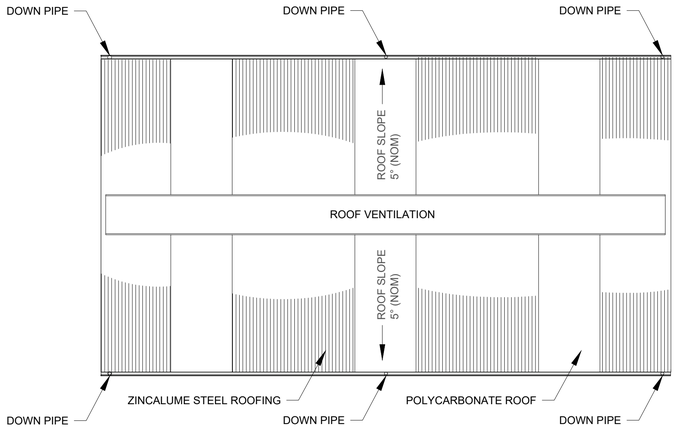
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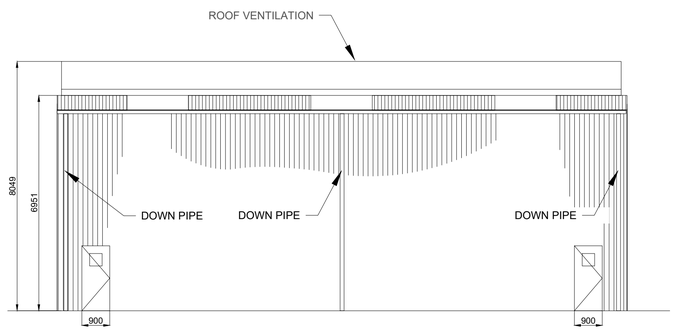
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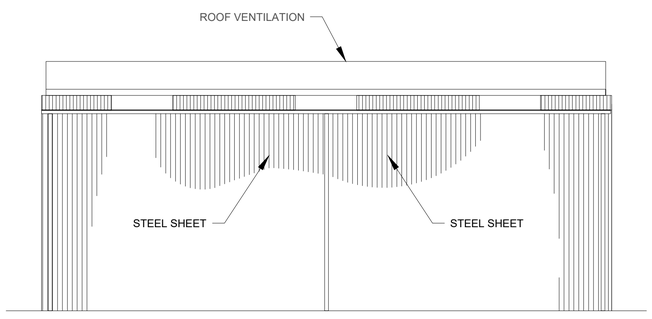
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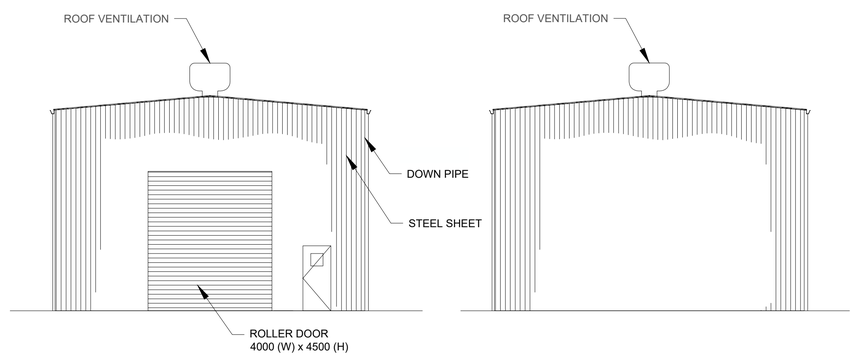
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FRONT VIEW



BACK VIEW



SIDE VIEW

REAR SIDE VIEW

CLIENT

TRINA SOLAR

PROJECT

THREE SPRINGS PV BESS PLANT

TURKEY FLAT ROAD, KADATHINNI, WA 6519
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REVISION		DATE	DESIGNED BY	DRAFT BY	CHECKED BY	APPROVED BY
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Appendix C – Engagement Summary Report

Engagement Summary Report

Killawarra Solar and BESS

Trina Solar
Suite 1503, 31 Market Street, Sydney NSW 2000

Prepared by:

SLR Consulting Australia

SLR Project No.: 675.072651.00001

4 April 2025

Revision: 0.1

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
0.1	4 April 2025	Brody MacLeod	Esther Diffey	Genelle Abolis
	Click to enter a date.			
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	Click to enter a date.			

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Suite 1503, 31 Market Street, Sydney NSW 2000(the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

An eight-week formal communications and stakeholder engagement (CSE) program was delivered between Monday, 3 February 2025 and Friday, 28 March 2025.

The purpose of the CSE program was to build awareness and understanding of the Killawarra Solar and BESS Project (the Project) and capture initial stakeholder and community feedback for consideration in subsequent Project phases. Insights garnered through consultation have supported the Project's understanding of potential impacts, mitigation strategies and opportunities to support strong outcomes for the Three Springs community. The CSE program aligns with the Project's development approval process and supports Trina Solar's development application (DA).

The CSE program encompassed engagement with strategic community and stakeholder cohorts identified based on their respective levels of interest in, and influence over, various facets of the Project.

Through the Development Assessment Panel pathway, the DA is anticipated to be referred to relevant State agencies for comment. Consequently, State agencies targeted through the CSE program were limited to those identified and recommended by the Shire of Three Springs to engage with prior to DA lodgement.

A range of activities were delivered by SLR Consulting to share information regarding the Project. Consultation activities included project briefings and meetings with stakeholders, and a community information session for Shire of Three Springs residents and businesses.

It is recognised that additional meetings were undertaken with some stakeholders to discuss technical details surrounding elements of the Project design. This includes ongoing liaison with Western Power regarding the Project's grid connection and sub-station design. These technical meetings have been excluded from the formal CSE program.

Various channels, including targeted posted letters, emails, social media, and print advertising, were used to promote the consultation opportunities.

There was limited participation in the program by general community members and proximal landowners, and there was a level of neutrality among some cohorts. It may be suggested that this neutrality reflects a potential disinterest in engaging at this early stage of planning until there is certainty that the Project will proceed.

Key insights garnered from the CSE program include:

- Stakeholder consultation has identified potential in-kind and financial supports to be considered as part of the Project's community benefits program. Various structure and administration options exist to manage the distribution and allocation of community funding.
- The Project's proactive integration of agri-solar management to allow livestock grazing within the solar farm area was well received by stakeholder cohorts; agri-solar management practices were highlighted as an important consideration by multiple stakeholders.
- Housing and workforce accommodation is an important consideration; there is a desire at a regional level for the Project to consider how it can contribute to new housing assets within the Shire or activate existing unused assets.
- Stakeholder consultation has highlighted expectations for the Project to consider ways to incentivise the relocation of the construction workforce and encourage

productive interactions between the workforce and the township to bolster the local economy.

This Engagement Summary Report (the Report) summarises the CSE program and discusses key outcomes of the communications and engagement activities delivered. The report provides recommendations for Trina Solar's future consultation activities.

It is recommended that the Project continue to foster strong relationships with regulatory and community stakeholders and provide regular updates on Project progress. Strategic forums with relevant stakeholder cohorts, including The Shire of Three Springs, Yamatji Southern Regional Corporation and Mid West Development Commission, should be established for targeted input into procurement and construction management planning.

Further consultation will be required to define the structure and parameters of a sustainable and effective community benefits program. Collaboration with both the Shire of Three Springs and the local community is recommended to ensure community funding is allocated, balancing the Shire's long-term strategic priorities with the community's 'grassroots' needs.

Ongoing communication and consultation will demonstrate the Project's commitment to transparency and collaboration and facilitate the effective integration of local knowledge to enhance Project delivery and outcomes.

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Appendices

Appendix A Communications and Stakeholder Engagement Register
Appendix B Communications collateral

Acronyms and Abbreviations

BESS	Battery Energy Storage System
CSE	Communications and Stakeholder Engagement
CSEP	Communications and Stakeholder Engagement Plan
DA	Development Application
DAP	Development Assessment Panel
DFES	Department of Fire and Emergency Services
FAQs	Frequently Asked Questions
GW	Gigawatt
IAP2	International Association of Public Participation
km	Kilometre
MW	Megawatt
MWDC	Mid West Development Commission
MWh	Megawatt-hour
The Project	Killawarra Solar and BESS Project
The Report	Engagement Summary Report
YSRC	Yamatji Southern Regional Corporation

1.0 Introduction

1.1 Purpose of this document

The Engagement Summary Report (the Report) details the activities delivered as part of the Killawarra Solar and BESS Project's (the Project) communications and stakeholder engagement (CSE) program and summarises notable outcomes and insights for consideration in subsequent Project phases. The Report identifies several opportunities and recommendations to support Trina Solar's future consultation activities.

1.2 Project background and overview

The Killawarra Solar and BESS Project is one of two projects Trina Solar is currently developing in Western Australia and will be considered among the State's largest solar and BESS projects once operational. Situated on a freehold site at 3688 Three Springs-Eneabba Road, Kadathinni, the Project is located approximately 25 kilometres (km) southwest of Three Springs in the Mid West region.

New loads of 1.8 gigawatts (GW) are anticipated in the region over the coming years due to industrial expansion and electrification. Connecting into existing Western Power transmission infrastructure, the Project is strategically positioned to provide essential grid capacity, enable quick responses to grid demands, and optimise energy use for the Mid West's growing industries.

As outlined in **Figure 1** below, key Project infrastructure will include:

- A 400-megawatt (MW) solar farm.
- 400MW/1,600 megawatt-hours (MWh) battery energy storage system (BESS).
- A purpose-built substation to facilitate grid connection, to be managed by Western Power.

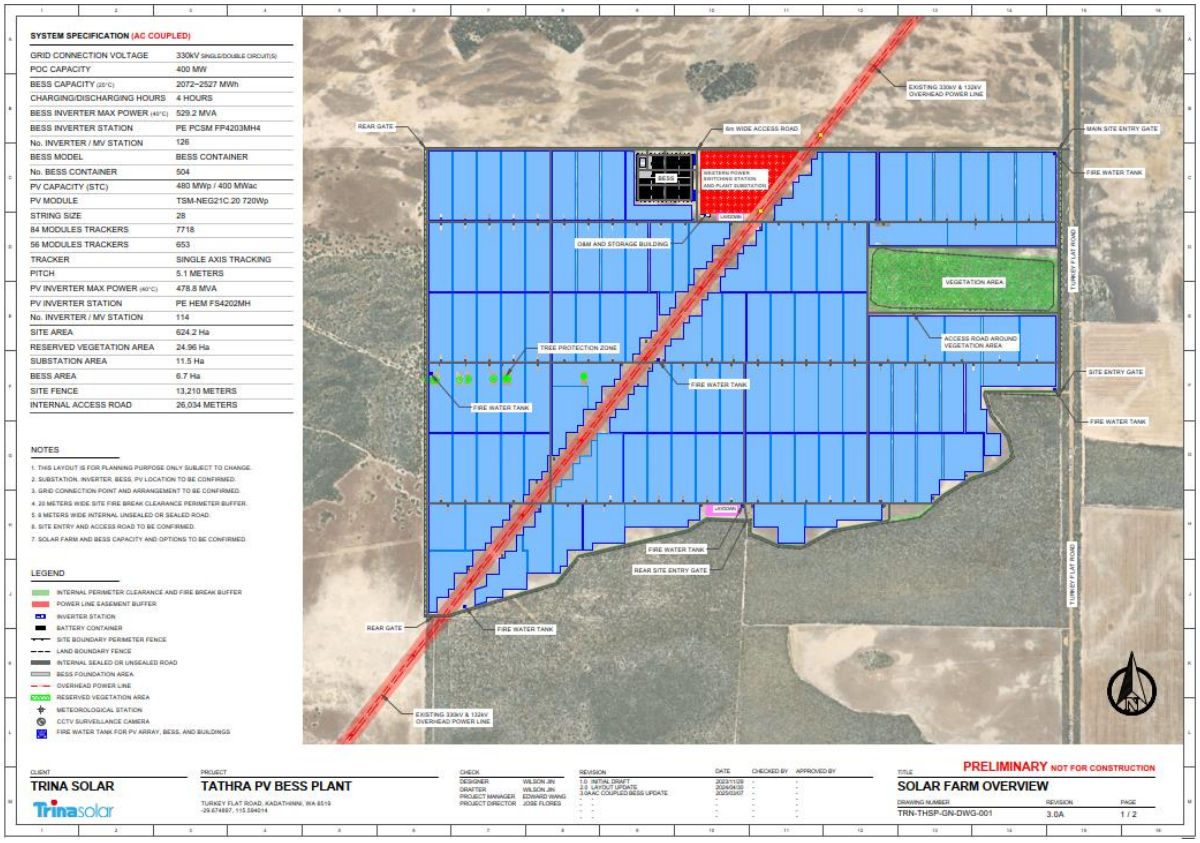


Figure 1: Preliminary Project Design

Trina Solar is progressing in its preliminary planning activities for the Project. A development application has been prepared for assessment through the Development Assessment Panel (DAP) pathway. A range of technical investigations and community and stakeholder consultations have been undertaken to enhance the Project's understanding of potential impacts and appropriate mitigation strategies.

The CSE program has shared information on and sought initial community and stakeholder insight and feedback surrounding the following aspects of the Project:

- The scope and preliminary outcomes of environmental and technical investigations completed.
- The current project design and infrastructure layout.
- Opportunities to support strong outcomes for the Three Springs community.

2.0 Communications and stakeholder engagement program

2.1 Overview

An eight-week formal CSE program was delivered between Monday, 3 February 2025 and Friday, 28 March 2025.

A Social Profiling and Risk Assessment was initially undertaken to establish a baseline understanding of the Project's key social issues, risks, and considerations. Findings from the

assessment informed the development and refinement of the Project's Communications and Stakeholder Engagement Plan (CSEP). Aligned to the Project's development approvals milestone, the CSEP reflected strategic consultation activities to establish relationships with key stakeholder groups, understand community values, and identify future opportunities for collaboration and engagement.

2.2 Approach and objectives

The CSEP was delivered in line with national and international best practice principles and guidelines and guided by the core principles of transparency, responsiveness, and accountability. In addition to the established overarching objectives outlined in **Figure 2** below, the CSE program supports the following project-phase specific objectives:

- Build awareness and understanding of Trina Solar and the Project.
- Validate and expand on the Project's understanding of community sentiment and social risks and opportunities through preliminary consultation.
- Capture initial stakeholder and community feedback for consideration in subsequent Project phases.

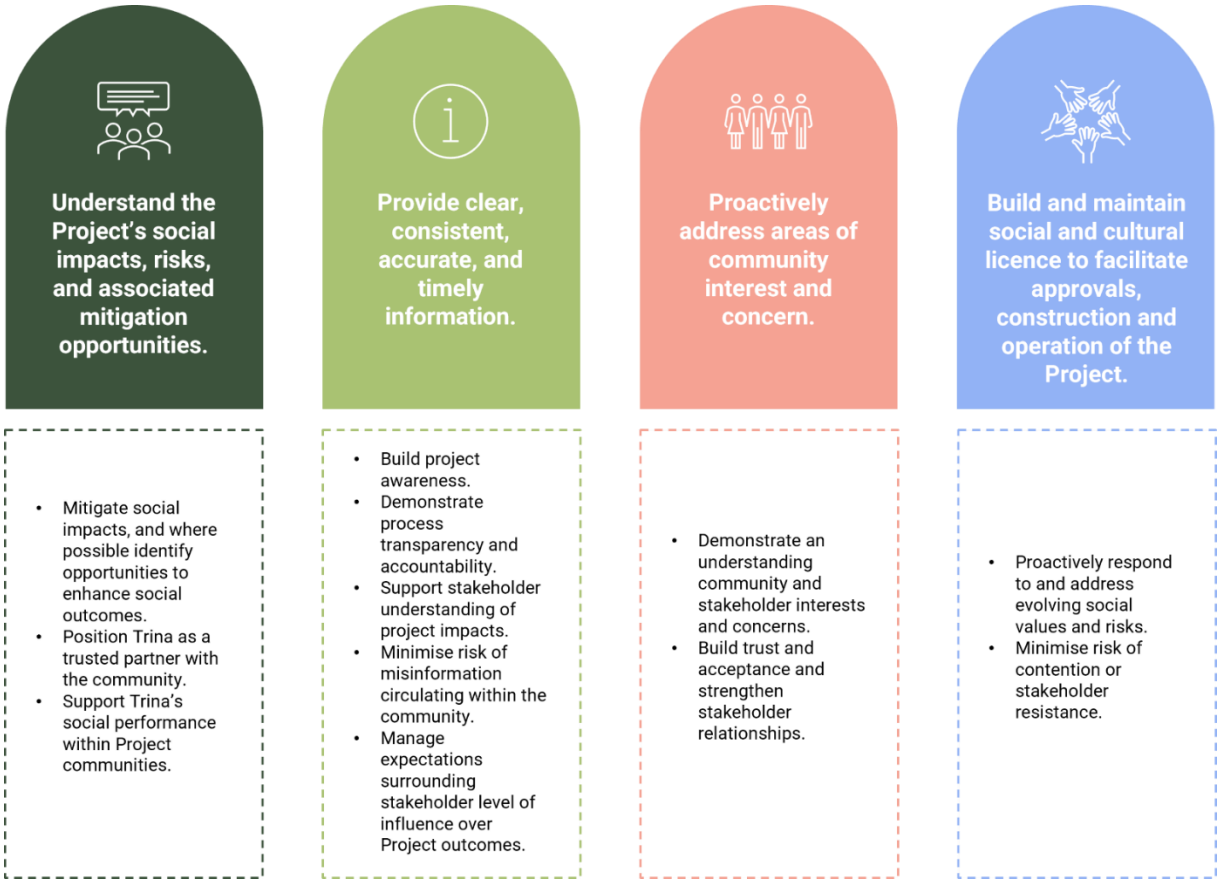


Figure 2: CSEP overarching objectives

2.3 Stakeholder identification

The Project's key stakeholder groups were identified based on their respective levels of interest in, and influence over, various facets of the Project. The International Association for Public Participation (IAP2) spectrum has been applied to assess and determine the appropriate level of engagement with each stakeholder group.

Table 1 below summarises key organisations and groups invited to engage with Trina Solar regarding the Project through the CSE program delivery.

Table 1: CSE program stakeholders

Category	Group	Organisation
Regulatory	Regulatory bodies and State agencies	• Department of Fire and Emergency Services. • Western Power.

	Local Government Authorities	• The Shire of Three Springs
		  ○ Elected members
		  ○ Planning technical officer

State and Regional	Non-regulatory state agencies	• Main Roads WA.
	Regional and industry bodies	• Northern Agricultural Catchment Council. • Mid West Development Commission.
Traditional Owner Groups	Native title holders	• Yamatji Southern Regional Corporation.
Community cohorts	Agriculture	• Three Springs Farm Innovation Network.
	Proximal landowners	• Landowners within a 4 km radius of the Project site.
	General community	• Shire of Three Springs residents. • Local businesses.

2.4 Communication and engagement tools and activities

Targeted communications and engagement activities have been undertaken to share information regarding the Project. To ensure stakeholders have a consistent touchpoint with the organisation and to foster strong relationships, Trina Solar's Project Manager attended and participated in all consultation forums as the public 'face' of the Project.

Communication and engagement tools and activities used to deliver the CSE program are summarised in **Table 2** and **Table 3** below. The key findings and insights garnered through the CSE program are discussed in **Section 3**. A register of communications and engagement touchpoints with stakeholder groups is included in **Appendix A.**

Table 2: Summary of engagement tools and activities

Tool	Activity description
Project briefings	A series of one-on-one project briefings conducted with key stakeholders to provide a tailored introduction and information on the Project.
Community information session	A drop-in community information session held for general community members and local businesses. The session provided a casual, accessible forum to learn more about the Project, provide feedback, and ask questions of the Project team.

Table 3: Summary of communications tools and activities

Tool	Activity description
Project webpage	A dedicated Project webpage developed and updated as the central source of Project progress updates and information.
Third-party collateral	Information regarding the Project's community information session was shared through third-party channels, including: • Three Springs Community Noticeboard (Facebook). • Shire of Three Springs Facebook Page. • Yamatji Southern Regional Corporation's email database (Yamatji Nation suppliers, contractors and businesses). • Three Springs post office (printed poster). • Shire of Three Springs administration office.
Targeted letterbox invitation campaign	A targeted letterbox campaign undertaken to promote the community information session and provide an opportunity for one-on-one meetings as requested. The campaign focused on landowners within a 4 km radius of the Project site who may be more significantly impacted by the Project's construction works or future operations.
Newspaper advertising	A newspaper advert designed and posted in the Shire of Three Springs Yakabout Times publication. Two advertisement slots were initially booked for: • 3 March 2025 (issue 301) • 17 March 2025 (issue 302) The advertisement featured in issue 302 only due to an administrative error. The purpose of the adverts was to promote the community information session and encourage attendance.
Project collateral	Project-specific collateral developed and distributed as part of the CSE program to inform the community and stakeholders of the Project and opportunities to participate. Key collateral included: • Project overview flyer. • Community information session advert. • FAQ document. • Presentation slide deck.

Tool	Activity description
	• Printed site plans and maps.

3.0 Communications and stakeholder engagement outcomes

3.1 Communications activities

3.1.1 Resident letterbox drop

On 21 February 2025, seven targeted letters were distributed via Australia Post to landowners within a 4 km radius of the Project site. Recognising the potential for these landowners to be affected by factors such as construction disruption, the objectives of the letters were to:

- Inform recipients of the Project and current planning activities.
- Encourage participation in the upcoming community information session.
- Provide an option for landowners to engage with the Project team in a one-on-one meeting to address specific queries or concerns.

Landowners included within the posted letter catchment area are outlined in **Figure 3** and **Table 4** below. Contact details for each letter recipient were provided by the Shire of Three Springs.



Figure 3: Posted letter catchment area

Table 4: Proximal landowner details

Landowner name	Address
D. Groves	18 Endeavour Drive, Wandina WA 6530
Gary Whyte	PO Box 163, Three Springs WA 6519
SJ Ploza	PO Box 43, Three Springs WA 6519
Sunset Farm Pty Ltd	PO Box 60, Three Springs WA 6519
Virdis Ag	Suite 3, Level 3, 429 Swift Street, Albury NSW 2640
Weemilah Farming Pty	PO Box 104, Leederville WA 6902
Wittenoom Hills Pty	PO Box 861, Esperance WA 6540

Extension Hill Pty Ltd is the landowner of the site where the project is proposed. Due to their existing relationship with Trina Solar, Extension Hill Pty Ltd was excluded from the distribution list of the posted letter.

No formal responses or requests for individual meetings were received from the landowners contacted.

3.1.2 Website updates

A dedicated project website, as seen in **Figure 4** below, was established and will remain live for the Project's planning and construction. The website serves as a central source of

information regarding the Project. In addition to progress updates and general Project information, the website links users to informational resources including the Killawarra Solar and BESS information flyer and frequently asked questions (FAQs).

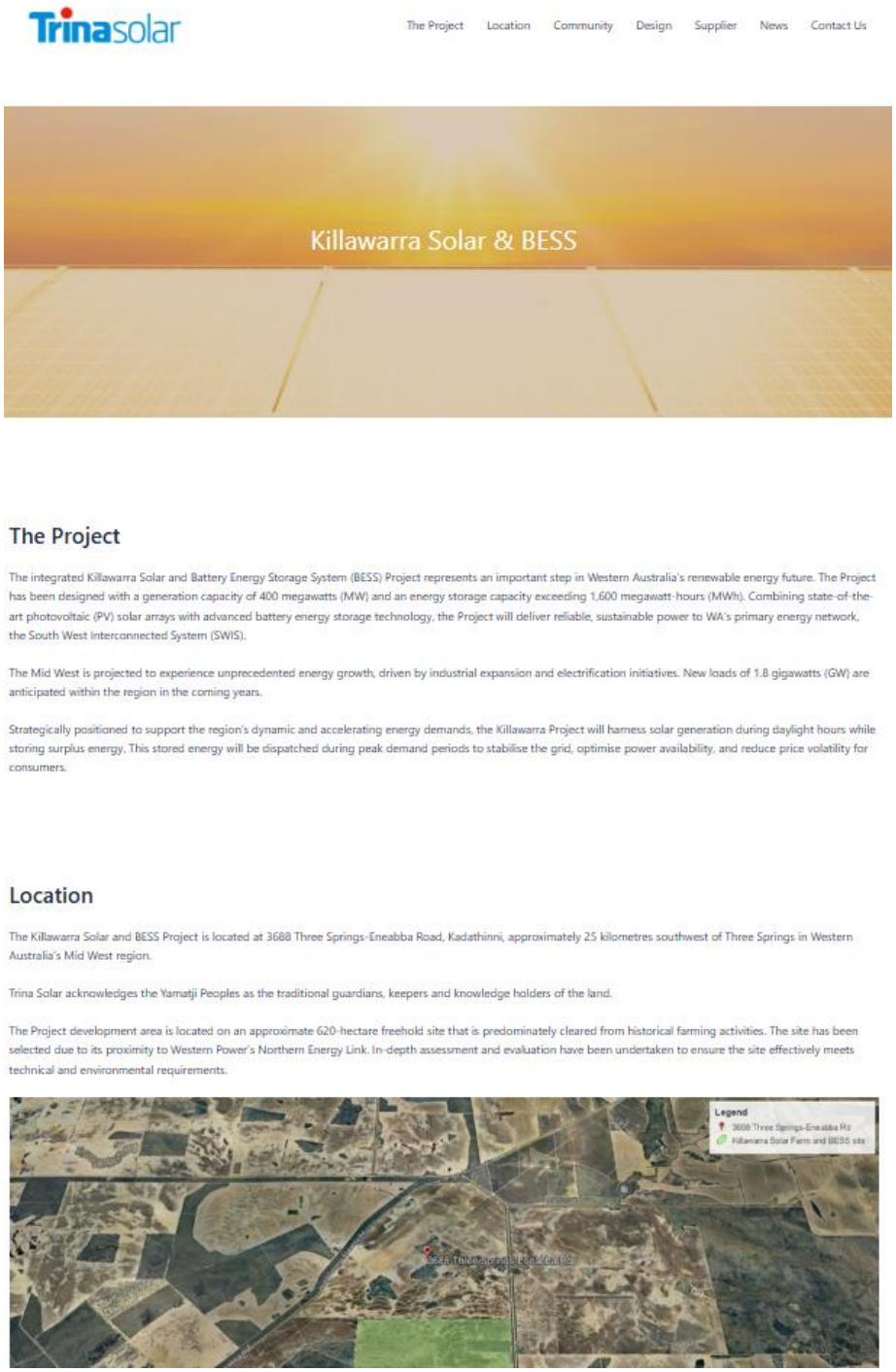


Figure 4: Project website

3.1.3 Third-party promotion

Information regarding the Project's community information session has been shared through the following third-party channels:

- Three Springs Community Noticeboard
  - Facebook page
- Shire of Three Springs
  - Facebook page
  - Administration office (poster)
- Yamatji Southern Regional Corporation
  - Business and contractor email database
- Three Springs Post Office
  - Poster

This promotion has allowed the Project to broaden its reach within the community and build awareness of Project activities and engagement opportunities.

3.1.4 Newspaper advertising

The community information session was formally promoted through the Shire of Three Springs' *Yakabout Times* publication.

Two adverts were initially booked for the following issues:

- Issue 301, 3 March 2025
- Issue 302, 17 March 2025

While two advert slots were booked, the advert only appeared in Issue 302 due to an administrative error. The advert design can be seen in **Figure 5** below.



Figure 5: Yakabout Times newspaper advert

3.1.5 Communications materials

A range of printed and digital collateral and communication materials were developed to aid consultation activities and support clear, consistent messaging regarding the Project.

PDFs of collateral developed are attached in **Appendix B**.

3.2 Engagement activities

3.2.1 Project briefings and meetings

A total of six online meetings and project briefings were conducted with key stakeholders. All briefings were tailored to the stakeholders' areas of Project interest and concern.

A summary of the project briefings and participants is provided in **Table 5** below.

Table 5: Summary of project briefings and meetings

Activity	Date	Format	Stakeholder participants	Key Themes / Discussion Points
One-on-one meeting *	18 September 2025	Online	Shire of Three Springs: • Keith Woodward, CEO • Simon Lancaster, Planning Advisor (Shire of Chapman Valley)	• Advice provided on visual impact, land use considerations, stakeholder engagement and traffic: ○ A detailed visual impact assessment not required; however, a representative photomontage from a viewpoint along Three Springs-Eneabba Road (wildflower route) may alleviate DAP concerns. ○ Integrated solar-agri management practices are to be considered to address the loss of agricultural land use. ○ Engagement with neighbouring landowners to be undertaken prior to development application lodgement. ○ Further consultation with the Shire is required regarding construction traffic management.
Project briefing *	11 December 2025	In person / Online	Shire of Three Springs • Elected members	• Project briefing to elected members, including an overview of project scope and timings. • Key areas of interest raised by elected members include:

Activity	Date	Format	Stakeholder participants	Key Themes / Discussion Points
				○ Cumulative impacts of renewable energy development within the region. ○ Bushfire Management Plan and water use. ○ Community benefits associated with project delivery and opportunities to establish a Development Fund with the Shire. ○ Opportunities for the integration of agri-solar management practices. ○ Tourism integration with existing wildflower route.
One-on-one meeting	6 March 2025	Online	Shire of Three Springs: • Keith Woodward, CEO • Simon Lancaster, Planning Advisor (Shire of Chapman Valley)	• Confirmation of DAP process, including statutory advertising periods and State agency pre-referral engagement recommendations. • Traffic impact management considerations, including a road use agreement to ensure road deterioration can be addressed quickly during construction. • Potential community concerns and sensitivities associated with the impacts of road closures on harvesting schedules and local road maintenance during construction.
Project briefing	12 March 2025	Online	Mid West Development Commission: • Nils Hay, CEO • Kyle Williams, Senior Regional Development Officer	• Housing and workforce accommodation were noted as a key challenge and consideration for the Project. • Community benefits planning, including structure and distribution of funds, and integration with local content opportunities, and skills and capability development. • Community concerns and sensitivities associated with loss of agricultural land and bushfire response.
Project briefing	13 March 2025	Online	Yamatji Southern Regional Corporation (YSRC):	• Changes to YSRC's survey process, including the establishment of a Heritage Services Panel to meet increasing survey and monitoring requirements.

Activity	Date	Format	Stakeholder participants	Key Themes / Discussion Points

			• Celeste Douglas (Proponent Coordinator)
			• Brooke O'Donnell (Heritage Manager)
				• Determination of the Project's Heritage approach and pathway:
				  ○ Project to adopt an avoidance strategy with heritage values.
				  ○ Heritage Protection Agreement to be signed between Trina Solar and YSRC.
				  ○ Submission of Activity Notice in the short-term, with timings for heritage surveying to be determined in the future.
				• Yamatji local content and business participation opportunities.
				• Future joint venture / equity-share / leasing opportunities with YSRC using YSRC-owned land.

Project briefing	24 March 2025	Online	Department of Fire and Emergency Services (DFES):
			• Desmond Abel (Director, Land Use Planning)
			• Sasha De Brito (Senior Land Use Planning Officer)
			• Wayne Frampton (Acting Hazmat Manager)
			• Jeff Davis (Special Risks)
				• Outlined the Project's voluntary compliance with relevant State bushfire legislation and guidance.
				• Discussion regarding:
				  ○ Running grass fires under panels.
				  ○ Road access to the site via Turkey Flat Road and the surrounding road network.
				  ○ Access constraints along the southern boundary of the Project site due to existing vegetation.
				  ○ Preferences for water tank locations and capacity.
				  ○ Potential for oil transformer fires associated with Project infrastructure.
				  ○ Future liaison with DFES through detailed design.

**Meetings held outside the formal CSE program, documented within the Report given their relevance to the Project's development application.*

3.2.2 Community information session

The community information session was held on Tuesday, 18th March 2025, between 5:00 p.m. and 6:30 p.m. at the Three Springs Sports Pavillion. The purpose of the session was to provide local community members within the Shire of Three Springs an opportunity to learn about the Project and ask questions of the Project team.

The session was timed intentionally to avoid the agricultural seeding season and was in an evening time slot to maximise attendance. The session attracted a relatively small turnout, with a total of three people attending over the course of the evening.

Information shared was tailored to each attendee's interests and concerns, drawing on Project site plans and printed materials to support their understanding. A survey form was available for attendees to formalise their feedback and insights.

An overview of general insights garnered from the session is outlined below.

General sentiment

- Attendees included residents of the township of Three Springs and the current tenant of the Project site.
- No strong sentiment toward the Project or concerns regarding construction and operational impacts were indicated.
- There was a general curiosity about Project timing and approvals; attendees noted the volume of proponents and proposals active in the region and queried the likelihood of the Project's progression.
- Understanding how the Project 'fit' within the context of Western Power's broader transmission upgrades and other solar and BESS projects proposed for the area was a topic of interest.
- Attendees indicated a desire to stay up to date on Project progress.

Traffic and vehicle movements

- The Project site's current tenant noted considerable increases in vehicle movements along Turkey Flat Road during harvesting and seeding seasons. These movements are predominately associated with the commercial farming property east of the Project site.

Project design

- Opportunities for design refinement to accommodate sheep/cattle grazing and movement from the grazing paddocks to the north and south of the current Project site were identified.

Project name

- It was raised that the current Project name may cause some confusion due to the existence of a separate 'Killawarra Farm' located within the Shire of Three Springs.
- An attendee noted that some members of the broader community were under the impression that Trina Solar was developing two solar projects – one at the current Project site and one at the Killawarra Farm location.

4.0 Summary of key insights and themes

A thematic summary of key insights gathered through the CSE program across stakeholder groups is provided below. These insights have informed the Project team's understanding of community and stakeholder values, areas of interest and concern, and future opportunities for engagement.

Engagement apathy

Engagement activities generally yielded minimal discussion, questions or strong sentiment, suggesting a certain level of neutrality among some stakeholders and community cohorts.

This sense of apathy may be due to some engagement fatigue; given the number of proposals within the Shire – all at various stages of development – stakeholders and the community may be uninterested in engaging at this early stage of Project development until there is certainty that the Project will proceed.

Community benefits

Discussion with Mid West Development Commission (MWDC) highlighted the opportunities and considerations associated with the Project's community benefits planning. Various structure and administration options exist to manage the distribution and allocation of community funding.

Stakeholder consultation has identified potential in-kind and financial supports to be considered as part of the Project's future community benefits program. This includes the provision of solar panels for Shire buildings, tourism integration, skills and capability development through traineeships and TAFE /district high school partnerships, contribution toward local housing assets through workforce accommodation construction, and local business participation opportunities, including for Yamatji Nation businesses.

Loss of agricultural land-use

With a strong agriculture industry, there is considerable discourse surrounding the loss of productive agricultural land with the development of renewable energy projects in the Mid West region. Multiple stakeholder groups highlighted a desire for the Project to consider agri-solar management practices in Project planning to retain some agricultural use of the Project site. The Project's proactive integration of agri-solar management to allow livestock grazing within the solar farm area was well received by stakeholder cohorts.

Housing and workforce accommodation

The cumulative impacts of renewables development within Mid West region on housing availability was noted as a key challenge for projects and the communities in which they operate. With limited workforce accommodation options, Project construction can exacerbate housing pressures. Using and/or reactivating existing Shire assets and exploring opportunities to contribute to new housing assets were identified as potential options to support a strong legacy for the Three Springs community while addressing workforce accommodation requirements.

Construction impacts on the local road network

The importance of early and on-going collaboration with the Shire to manage traffic impacts and local road maintenance during the Project's construction was reinforced through stakeholder consultation. It is recognised that an increase in construction traffic, particularly over the winter months and during key agricultural seasons (seeding and harvesting), has

the potential to have implications on local road users and farming operations and may be an area of concern for some community cohorts.

The Project – community interface

Aligned to State and regional economic development strategies, supporting regional population growth through improved housing, employment opportunities, and strong community amenities underpins local government planning and, in some instances, community acceptance of projects and development within the region.

Stakeholder consultation has highlighted expectations for the Project to consider ways to incentivise relocation of the construction workforce, encourage productive interactions between the workforce and the township and contribute to community amenities to bolster the local economy and support regional strategic priorities.

5.0 Recommendations and future considerations

Effective engagement and communication strategies are essential for the ongoing success of the Project. Through the delivery of the CSEP and insights gathered to date, the following recommendations and future considerations have been identified.

Targeted consultation opportunities to support construction planning and delivery.

As the Project progresses to construction, it is recommended that Trina Solar consider targeted opportunities for input by key stakeholder groups regarding construction planning and management. This may include early engagement with the Shire of Three Springs to agree on appropriate traffic management and road maintenance requirements. Understanding local capabilities through consultation with YSRC and MWDC is also recommended, in addition to consultation with potential local businesses, suppliers and contractors to support local business capacity development and preparedness for participation in construction activities.

On-going communications, aligned to Project milestones.

It is recommended that a consistent program of content and communications be established to share timely updates and information regarding the Project's progress. The Killawarra Solar and BESS website provides a centralised platform for information dissemination. Furthermore, the establishment, promotion and utilisation of a Project email subscriber list will allow community and stakeholder groups to easily 'opt-in' to receiving information over time. This may be particularly beneficial for sharing time-sensitive updates regarding construction activities.

Development of a community benefits program in collaboration with relevant stakeholders and the community.

Further consultation will be required to determine the most appropriate structure, governance, administration and parameters of a community benefits program for the Project. It is recommended that the community benefits program be designed with consideration of both local government priorities and 'grassroots' community needs. Providing community members an opportunity to contribute to community benefits planning is a productive way to channel community insights, feedback and local knowledge while building rapport and trust.

Address Project name misconceptions proactively.

To avoid confusion with another renewable energy project proposed within the Shire of Three Springs, the Project name was updated from ‘Tathra Solar and BESS’ to ‘Killawarra Solar and BESS’. The Project name ‘Killawarra Solar and BESS’ has been featured on all public-facing materials to date. It is understood that some community members are under the impression that Trina Solar is progressing multiple projects within the Shire of Three Springs. Clear and consistent key messaging should be developed and integrated in future communications materials to address this misconception proactively.

Appendix A Communications and Stakeholder Engagement Register

Engagement Summary Report

Killawarra Solar and BESS

Trina Solar

SLR Project No.: 675.072651.00001

4 April 2025

Killawarra Solar and BESS

Communications and Stakeholder Engagement Register

Date	CSE Activity	Stakeholder	Stakeholder attendees / recipients	Project representatives	Activity description	Issues raised	Outcomes / Commitments	Actions
26-02-2025	Email	Local government	**Shire of Three Springs:** - Keith Woodward (CEO) - Tricia McKeon (Executive Services)	Brody MacLeod (SLR)	Request for meeting.	Request for meeting to discuss upcoming community engagement activities and confirm DAP lodgement process.	- Meeting arranged.	-
27-02-2025	Email	Industry body	**Northern Agricultural Catchment Council:** - Katherine Allen (CEO)	Edward Wang (Trina Solar)	Invitation for project briefing	Formal introduction and invitation for organisation to attend a project briefing to learn about the Project, understand interest/concerns and identify opportunities for future collaboration.	- No response received.	-
27-02-2025	Email	Community group	**Three Springs Farm Innovation Network:** - Jim Heal (President)	Edward Wang (Trina Solar)	Invitation for project briefing	Formal introduction and invitation for organisation to attend a project briefing to learn about the Project, understand interest/concerns and identify opportunities for future collaboration.	- No response received.	-
27-02-2025	Email	Industry body	**Mid West Development Commission**	Edward Wang (Trina Solar)	Invitation for project briefing	Formal introduction and invitation for organisation to attend a project briefing to learn about the Project, understand interest/concerns and identify opportunities for future collaboration.	- Meeting arranged with MWDC	-
26-02-2025	Phone correspondence	Regulatory / approvals	**Yamatji Southern Regional Corporation**	Barbra Friedewald (Element)	Introductory phone call	Discovery phone call to determine appropriate process for establishing contact with YSRC. Email follow up.	- Meeting arranged with YSRC representatives to share project presentation, understand YSRC expectations and explore opportunities.	-
06-03-2025	Meeting	Local government	**Shire of Three Springs:** - Keith Woodward (CEO) - Simon Lancaster (Planning Advisory - Shire of Chapman Valley)	Edward Wang (Trina Solar) Lisa Saraceni (SLR) Brody MacLeod (SLR)	Meeting to provide project update and discuss engagement activities.	SLR sought feedback on: - DAP process - Consultation expectations - Community information session promotion	- DAP approvals process confirmed. - Traffic congestion and road maintenance noted as key community concern. - Shire agreement to promote upcoming community information session. - Confirmation on traffic management requirements to be considered in Construction Management Plan. - Shire endorsement of engagement approach and technical studies to inform DA. - Recommendation for pre-engagement with Main Roads (Mid West) and DFES prior to DA lodgement.	SLR to: - Provide information on noise modelling outcomes. - Provide community information session details for Shire promotion. - Arrange briefings with Main Roads WA and DFES.
10-03-2025	Email	State agency	**Main Roads Western Australia:** - Mark Willson	Brody MacLeod (SLR)	Request for meeting.	Request for meeting to discuss the traffic impact assessment for the Project and seek preliminary feedback from Main Roads.	- No response received.	-
12-03-2025	Meeting	Industry body	**Mid West Development Commission:** - Nils Hay, CEO - Kyle Williams, Senior Regional Development Officer	Edward Wang (Trina Solar) Brody MacLeod (SLR)	Project briefing to discuss MWDC insights, feedback and opportunities.	- Housing and workforce accommodation were noted as a key challenge and consideration for the Project. - Community benefits planning, including structure and distribution of funds, and integration with local content opportunities, and skills and capability development. - Community concerns and sensitivities associated with loss of agricultural land and bushfire response.	- Project commitment to keep MWDC informed of the outcomes of the Project's community benefits planning. - MWDC noted availability to support the Project navigate approvals / policy 'road blocks'. - Further discussions are required with MWDC's local content advisor to understand business capabilities in the region and opportunities to optimise local business participation in the construction/operation of the Project.	Trina Solar to progress discussions regarding local content opportunities and keep MWDC informed of Project planning.
13-03-2025	Email	State agency	**Department of Fire and Emergency Services:** - Sasha De Brito (Senior Land Use Planning Officer)	Brody MacLeod (SLR)	Request for meeting.	Request for meeting to discuss the Project's voluntary compliance with bushfire regulations and guidance, including proposed bushfire mitigation strategies.	- Meeting arranged with DFES land use planning team. The Project's Development Application will be referred to DFES' Special Operations team for assessment against the CFA Design Guidelines and Model Requirements - Renewable Energy Facilities v4 (August 2023) . The Special Operations team may be unable to attend the meeting.	-
13-03-2025	Meeting	Regulatory / approvals	**Yamatji Southern Regional Corporation:** - Celeste Douglas (Proponent Coordinator) - Brooke O'Donnell (Heritage Manager)	Edward Wang (Trina Solar) Jose Flores (Trina Solar) Barbra Friedewald (Element) Brody MacLeod (SLR)	Project briefing to discuss the Project's heritage pathway	- Changes to YSRC's survey process, including the establishment of a Heritage Services Panel to meet increasing survey and monitoring requirements. - Determination of the Project's Heritage approach and pathway. - Project to adopt an avoidance strategy with heritage values. - Submission of Activity Notice in the short-term, with timings of heritage surveying to be determined in the future. - Yamatji local content and business participation opportunities. - Future joint venture / equity-share / leasing opportunities with YSRC using YSRC-owned land.	- Heritage Protection Agreement to be signed between Trina Solar and YSRC. - YSRC to share information regarding upcoming community information session with Cultural Committee members and through business database.	- Provide YSRC information on community information session for distribution. - Trina Solar to progress Hertitage Protection Agreement.
18-03-2025	Public event	General community	-	Edward Wang (Trina Solar) Brody MacLeod (SLR) Lisa Saraceni (SLR)	Community information session to provide introductory overview of the Project.	- Timings for approvals and likelihood Project will proceed. - Increased vehicle movements on Turkey Flat Road during seeding/harvesting season. - Design considerations to enable livestock movements from north-south paddocks on either side of Project site. - Potential confusion regarding projects being developed by Trina Solar in the LGA - some community members are under the impression there are two projects (Tathra and Killawarra).	- Project to advise of future community information sessions.	- Design considerations to be reviewed.
24-03-2025	Meeting	Regulatory / approvals	**Department of Fire and Emergency Services:** - Desmond Abel (Director, Land Use Planning) - Sasha De Brito (Senior Land Use Planning Officer) - Wayne Frampton (Acting Hazmat Manager) - Jeff Davis (Special Risks)	Edward Wang (Trina Solar) Linden Wears (Linfire) Brody MacLeod (SLR) Renee Young (Element)	Project briefing to discuss Project compliance with bushfire regulations and guidance.	- Outlined the Project's voluntary compliance with relevant State bushfire legislation and guidance. Discussion regarding: - Running grass fires under panels. - Road access to the site via Turkey Flat Road and the surrounding road network. - Access constraints along the southern boundary of the Project site due to existing vegetation. - Preferences for water tank locations and capacity. - Potential for oil transformer fires associated with Project infrastructure. - Future liaison with DFES through detailed design.	- Project to continue to liaise with DFES throughout detailed design.	- No further action at this stage of the Project.

Appendix B Communications collateral

Engagement Summary Report

Killawarra Solar and BESS

Trina Solar

SLR Project No.: 675.072651.00001

4 April 2025

KILLAWARRA SOLAR AND BESS

Frequently Asked Questions



LAST UPDATED: MARCH 2025

PROJECT OVERVIEW

Q: What is the Killawarra Solar and BESS Project?

Trina Solar is proposing a new solar farm and battery energy storage (BESS) project located in the Mid West region of Western Australia.

The Project will combine large-scale solar with long-duration energy storage to provide a cost-effective and reliable renewable energy source and essential grid capacity for new and expanding industries.

The integrated facility will harness solar generation during daylight hours and store surplus energy. Stored energy will be released into WA's main network, the South West Interconnected System (SWIS), during peak demand periods to stabilise the grid's energy supply.

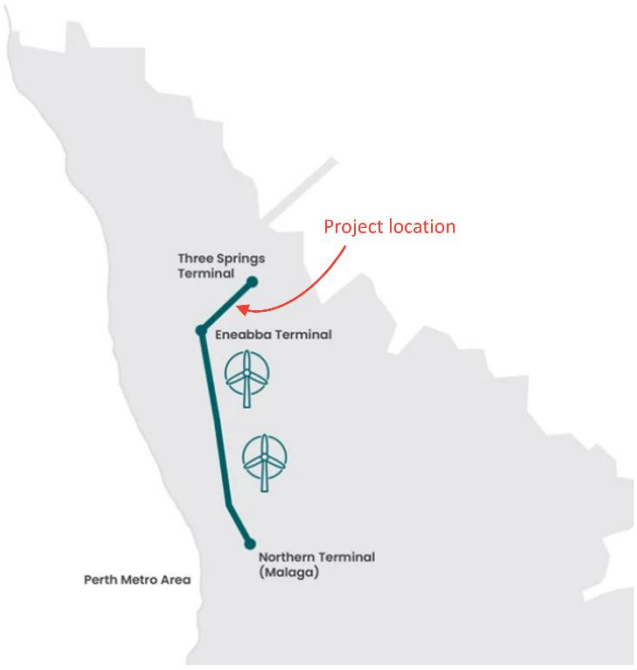
Q: Where will the Project be located, and why?

The Project is proposed on a freehold site located at 3688 Three Springs-Eneabba Road, Kadathinni, approximately 25 kilometres southwest of the town of Three Springs.

Trina Solar acknowledges the Yamatji Peoples as the Traditional Owners of Country on which the Project is proposed.

The proposed development will occupy approximately 620 hectares of the 2,700 total land area of the site.

The site has been selected due to its strategic positioning between existing SWIS terminals and its ability to accommodate the required infrastructure while minimising environmental and community disturbance.



Q: What infrastructure will the Project include?

The proposed development includes the construction and operation of the following key infrastructure:

- 400 MW solar farm, including over 680,000 solar panels.
- 400 MW / 1600 MW hours battery energy storage system (BESS), encompassing approximately 504 BESS containers.

A purpose-built substation will be located on the Project site and managed by Western Power. The substation will allow for the connection of the Project to the existing 330kV transmission line passing through the proposed development area.

Q: Why is the Project needed?

The Mid West region is projected to experience unprecedented energy growth in the coming years,

driven by industrial expansion and electrification initiatives. New loads of 1.8 gigawatts (GW) are anticipated within the region.

The Killawarra Solar and BESS Project's capacity and strategic location will allow for quick responses to electricity grid demand and optimise energy use for growing industries.

The Project has recently been granted a 'critical priority project' status by Western Power. Connection of 'critical priority projects' will be prioritised by Western Power in the coming years, acknowledging their importance to WA's energy transition and alignment to Western Power's strategic priorities.

Q: Who is Trina Solar?

Trina Solar is a global developer and manufacturer specialising in solar energy solutions. With a strong commitment to innovation and sustainability, Trina Solar products are utilised in residential, commercial, and utility-scale projects in over 150 countries.

Trina Solar has been operating in Australia since 2011, with offices in Sydney, Melbourne, Brisbane, and Perth. Killawarra Solar and BESS is one of fifteen projects – with a total capacity of over 2.5 GW – that Trina Solar is developing nationally.

Q: What is a BESS, and how does it work?

A Battery Energy Storage System (BESS) stores electricity energy in batteries for future use. Functioning similarly to a large-scale household battery with additional technology, a BESS stores electrical energy to be released back into the electricity grid when required.

A BESS typically contains a group of batteries housed in containers or enclosures. Key components of a BESS facility include inverters for converting energy, control systems for managing energy storage and distribution, and safety features to ensure efficient and reliable operation.

The Killawarra Solar and BESS Project will store electrical energy generated by the on-site solar farm.

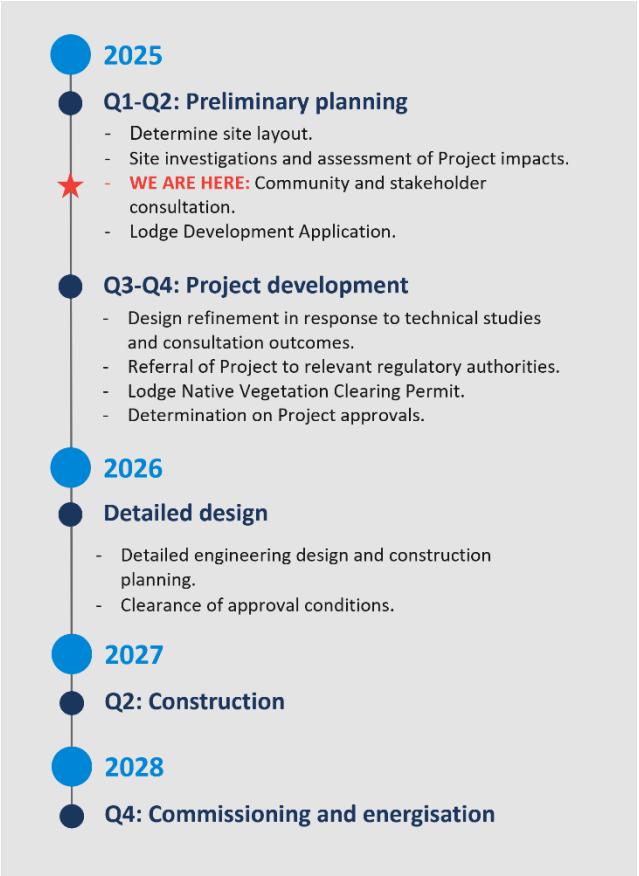
PLANNING AND APPROVALS

Q: What key milestones must the Project meet to proceed to construction?

Trina Solar is progressing with preliminary planning for the Project aligned to State development approval processes.

All regulatory approvals will be in place before construction commences. This includes:

- Obtaining development approval.
- Obtaining a native vegetation clearing permit.
- Addressing Aboriginal Cultural Heritage requirements.
- Securing a connection agreement with Western Power.



Q: What is the current status of the Project?

The Project must obtain development approval in accordance with the Shire of Three Springs Local Planning Scheme No 2.

A Development Application (DA) is currently being prepared for assessment through the Development Assessment Panel (DAP) pathway.

Technical and environmental investigations are being undertaken alongside community and stakeholder consultation to inform the Project design and support approvals processes.

The Project currently intends to lodge the DA in Q2 2025.

ENVIRONMENTAL CONSIDERATIONS

Q: What technical and environmental studies will the Project undertake?

Trina Solar has a strong understanding of the environmental considerations unique to solar and battery storage developments. The Project is committed to meeting the highest standards in environmental and social responsibility.

The Project is undertaking the following key assessments to support the approvals process:

- Amenity:
  - Noise impact assessment.
  - Visual impact assessment.
- Flora and Fauna:
  - Reconnaissance-level flora and vegetation survey.
  - Basic fauna survey.
  - Black Cockatoo Habitat assessment.
- Bushfire:
  - Bushfire risk assessment.
  - Bushfire management plan.
- Traffic
  - Traffic Impact Assessment.
- Aboriginal Cultural Heritage
  - The Project is working with the Yamatji Southern Regional Corporation to understand potential impacts on Aboriginal Cultural Heritage values in the Project area.

Q: How is the data from investigations and consultation used by the Project?

Technical investigations and community and stakeholder engagement outcomes will be used to understand potential impacts, refine the Project design, and identify appropriate management and mitigation strategies.

Outcomes from the technical investigations will be included as reports in the Project's formal Development Application submission.

WORKING WITH THE COMMUNITY

Q: Will there be opportunities for the community to provide feedback on the Project?

Consultation with stakeholders and the community will be ongoing throughout the Project's delivery. Trina Solar is committed to building strong, collaborative relationships and encourages you to share your feedback.

An initial information session will be held on Tuesday, 18th March 2025 to introduce the local community to the Project, gather feedback on the indicative Project design, and answer questions.

An opportunity to provide comment will also be provided to the community through the Development Application approval process.

The Project website will be regularly updated with new Project information and engagement opportunities as the project progresses. Visit the website at www.killawarrasolarandbess.com.au.

The Project team is available to answer questions and can be contacted via email at killawarra@trinasolar.com.

KILLAWARRA SOLAR AND BESS

Frequently Asked Questions



Q: How will the local community benefit from the Project?

The Killawarra Solar and BESS Project will play an important role in supporting growth and economic diversification in the Mid West region and a sustainable, net-zero future for Western Australia.

1. **Supporting WA's clean energy transition**

The Project's integrated facility will generate and store clean, renewable energy which will feed into the SWIS, reducing WA's reliance on fossil fuels.

2. **Improving energy resilience**

The Project's generation and storage capacity will support improved grid stability, ensuring a reliable energy source during peak demand times for growing industries.

3. **Opportunities for the local community**

The construction and operation of the Killawarra Solar and BESS will boost local job and business opportunities, support innovative industry development through agri-solar integration, and unlock opportunities for local service, amenity, and infrastructure improvements.

4. **A shared benefits approach**

Trina Solar will work collaboratively with the community to implement initiatives that address local needs, align with local values and priorities, and create a positive and lasting impact.

Q: Can local businesses participate in the Project?

Trina Solar is exploring opportunities to engage with local contractors and businesses to support the construction and operation of the Project.

To register an expression of interest and be kept updated on future business participation opportunities, please email us at killawarra@trinasolar.com.

Q: How can I find out more information about the Project?

For the latest Project information, visit www.killawarrasolarandbess.com.au or contact the Project team via email at killawarra@trinasolar.com.

Trinasolar

KILLAWARRA SOLAR FARM AND BESS



Project planning is underway, and we want to **hear from you**.

Trina Solar is planning the Killawarra Solar and Battery Energy Storage System (BESS) Project in Kadathinni, within the Shire of Three Springs. The Project will combine large-scale solar with long-duration energy storage to deliver reliable, cost-effective renewable energy for the Mid West region.

We are currently in an early planning stage and invite the community to share feedback on the Project design. Your input will help to shape the Project and ensure strong outcomes for the Three Springs community.

COMMUNITY INFORMATION SESSION

Join our upcoming information session to learn more, ask questions, and share your thoughts and feedback.

Tuesday, 18 March 2025 | 5.00 pm – 6.30 pm

Shire of Three Springs Sports Pavilion

– Lot 320, Mayrhofer Street, Three Springs WA 6519

killawarra@trinasolar.com | **www.killawarrasolarandbess.com.au**

Trinasolar

KILLAWARRA SOLAR AND BESS

Powering Western Australia's future with clean, reliable energy production and storage



Trina Solar is proposing a new solar farm and battery energy storage system (BESS) located in Three Springs, in the Mid West region of Western Australia.

The Project's integrated facility will play an important role in supporting regional growth. Combining large-scale solar with long-duration energy storage, the Project will offer a cost-effective and reliable renewable energy source and essential grid capacity for new and expanding industries.

UNDERSTANDING THE PROJECT

The Killawarra Solar and Battery Energy Storage System (BESS) Project is located in Kadathinni, approximately 25 kilometres southwest of the town of Three Springs in Western Australia's Mid West region. Situated on an approximate 620-hectare freehold site, the Project has been designed with the capacity to generate over 450 megawatts and store over 1,600 megawatts per hour, of electricity.

Strategically positioned to connect to Western Power's Northern Energy link, the Project will help to address the rising demand for renewable energy in the region. The integrated facility will generate and store electricity; stored electricity will be released into WA's main network, the South West Interconnected System (SWIS), during peak demand periods to stabilise the grid's energy supply.

With significant increases in energy demand forecasted within the Mid West region over the coming years, the Project's capacity and strategic location will allow for quick responses to electricity grid demand and optimise energy use for growing industries.

Key elements of the Project will include:

- 400 megawatt (MW) solar farm.
- 400 MW / 1600 MW/hours battery energy storage system (BESS).
- Purpose-built substation, to be managed by Western Power.



ABOUT TRINA SOLAR

Trina Solar is a global developer and manufacturer specialising in solar energy solutions. With a strong commitment to innovation and sustainability, Trina Solar's products are utilised in residential, commercial, and utility-scale projects in over 150 countries worldwide.

Combining strong project management and smart energy technologies, Trina Solar's projects leverage extensive research and development, and experience across the renewable energy value chain - from manufacturing to project ownership, development, and operation.

Trina Solar has been operating in Australia since 2011 with offices in Sydney, Melbourne, Brisbane, and Perth. Killawarra Solar and BESS is one of 15 projects - with a total capacity exceeding 2.5 gigawatts - that Trina Solar is currently developing nationally.

PROJECT TIMELINE

Trina Solar is progressing preliminary planning for the Project aligned to State development approval processes.

Trina Solar has a strong understanding of the environmental requirements unique to solar and battery storage developments. The Project is dedicated to meeting the highest standards in environmental and social responsibility.

A range of technical and environmental investigations and community consultation will be undertaken to support Project approvals and refine the infrastructure design.

2025

Q1-Q2: Preliminary planning

- Determine site layout.
- ***WE ARE HERE:** **Community and stakeholder engagement to support understanding of project impacts.**

Q3-Q4: Project development

- Site investigations and assessment of project impacts.
- Design refinement in response to technical studies.
- Referral of the Project to relevant regulatory authorities.
- Obtain development approval.

2026

Project approvals

- The project will not proceed until all relevant regulatory approvals have been obtained.

2027

Q2: Construction

- Construction commences.

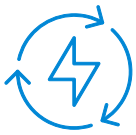
2028

Q4: Commissioning and energisation

DELIVERING LOCAL AND REGIONAL BENEFITS

Killawarra Solar and BESS will play an important role in supporting growth and economic diversification in the Mid West region and supporting a sustainable, net-zero future for Western Australia.

1. Supporting WA's clean energy transition



The Project's integrated facility will generate and store clean, renewable energy which will feed into the SWIS, reducing WA's reliance on fossil fuels.

2. Improving energy resilience



The Project's generation and storage capacity will support improved grid stability, ensuring a reliable energy source during peak demand times for growing industries.

3. Opportunities for the local community



The construction and operation of the Killawarra Solar and BESS will boost local job and business opportunities, support innovative industry development through agri-solar integration, and unlock opportunities for local service, amenity, and infrastructure improvements.

4. A shared benefits approach



Trina Solar will work collaboratively with the community to implement initiatives that address local needs, align with local values and priorities, and create a positive and lasting impact.

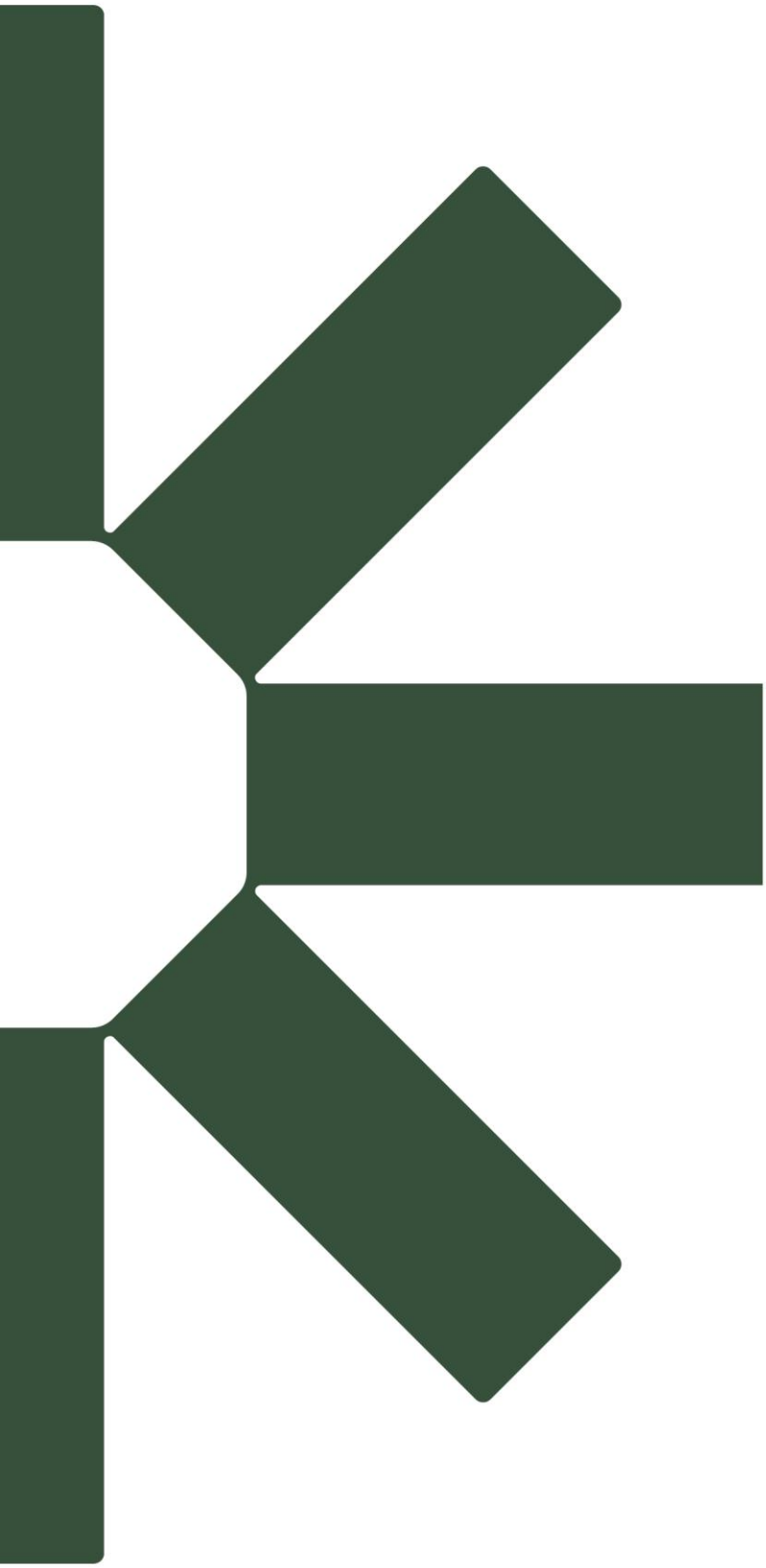
GET INVOLVED

Trina Solar is committed to building strong, collaborative partnerships with the local community. Over the coming months, we will be engaging with the community to share Project information, gather feedback, and identify ways we can support positive outcomes for Three Springs.

We value your input through the design consultation phase of the Project and encourage you to share your feedback.

Scan the QR code to learn more about Killawarra Solar and BESS.

For more information, reach out to us at killawarra@trinasolar.com or visit www.killawarrasolarandbess.com.au



Making Sustainability Happen

Appendix D – Noise Assessment Report

Killawarra Solar and BESS

Noise Assessment

Trina Solar

1 Farrer Pl
Sydney NSW 2000

Prepared by:

SLR Consulting Australia

Report 675.072651.00001

1 April 2025

Revision: 102

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
02	1 April 2025	Wei Kiat Yeo	P. Drew	P. Drew
0102	25 March 2025	Wei Kiat Yeo	P. Drew	P. Drew
0	15 November 2024	Wei Kiat Yeo	P. Drew	P. Drew

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Trina Solar (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

Trina Solar is proposing to build a solar farm and battery energy storage system (BESS) project within the Shire of Three Springs.

SLR has been engaged by Trina Solar to undertake a noise assessment of construction and operational activities of the Project to determine the level of compliance with state noise regulations.

A noise model was developed based on preliminary plans, supplied information and historical measurements to predict noise levels at the nearest sensitive receivers. These predictions were assessed against the relevant targets to determine the potential for compliance with the *Environmental Protection (Noise) Regulations 1997* ('the Regulations').

Noise emissions from the Project are predicted to comply with the Regulations.

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Appendices

Appendix A L_{A10} noise contours

1.0 Introduction

Trina Solar is proposing to build a solar farm and battery energy storage system (BESS) project (the 'Project').

SLR has been engaged by Trina Solar to undertake a noise assessment of construction and operational activities of the Project to determine the level of compliance with state noise regulations.

1.1 Site locality

The Project is located within the Shire of Three Springs – approximately 24 km southwest of the town of Three Springs.

Figure 1 presents an aerial image of the site, annotated to indicate the nearest sensitive receivers.

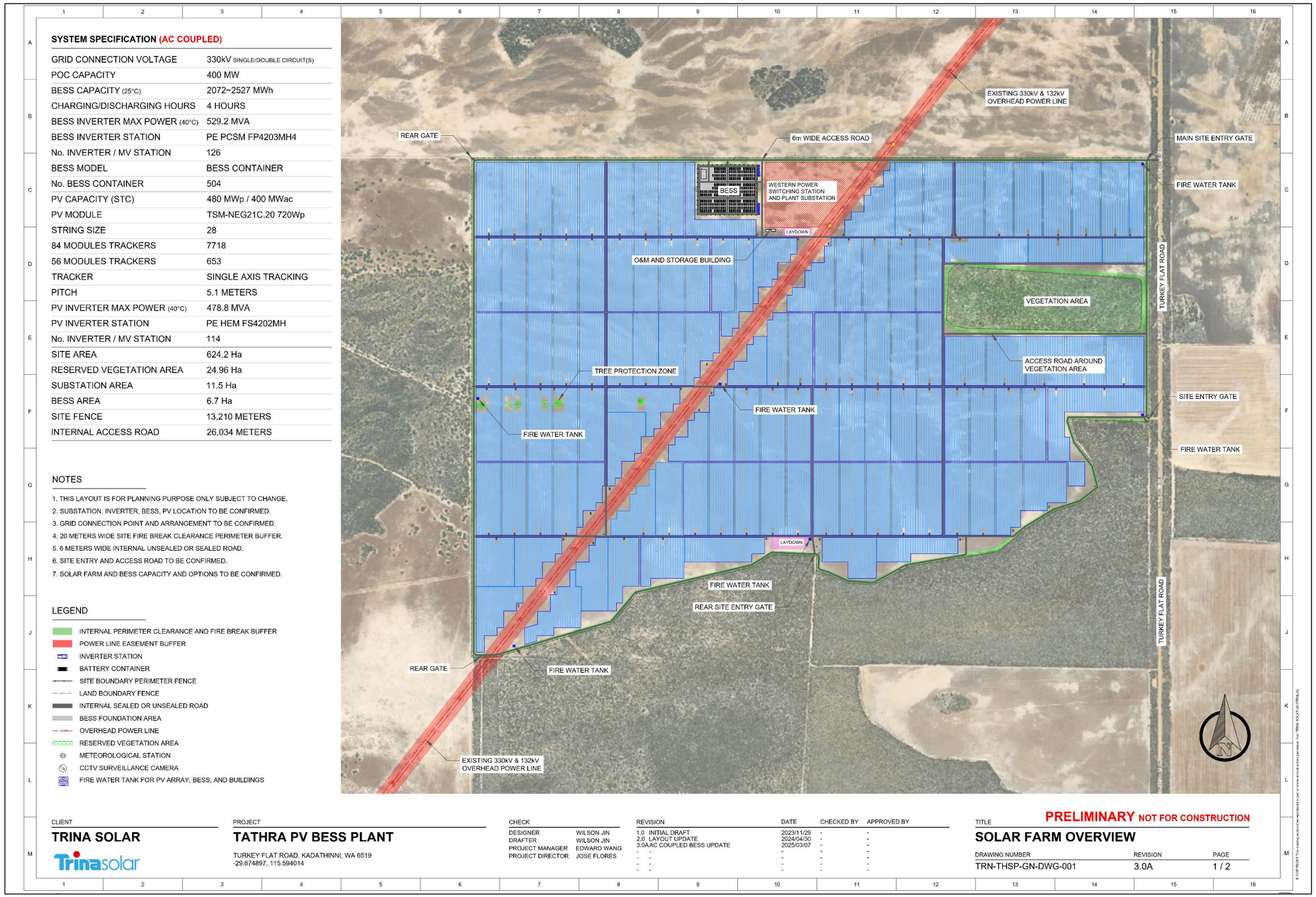
Figure 1 Aerial image annotated to indicate nearest sensitive receivers



1.2 Site plan

Figure 2 presents a preliminary drawing indicating an overview of the Project.

Figure 2 Preliminary drawing indicating an overview of the Project (drawing number TRN-THSP-GN-DWG-001, dated 30th April, 2024)



Based on **Figure 2** and information received, key equipment on site consists of the following:

- 504x BESS containers
- 126x BESS inverters (model PE PCSM FP4203MH4)
- 114x PV inverters (model PE HEM FS4202MH)
- 4x 240 MVA transformers (based on email dated 16 October 2024)

2.0 Criteria

2.1 Operation

Environmental noise emissions in Western Australia are regulated under the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations) ('the Regulations'). Generally, to achieve compliance with the Regulations, noise levels at nearby residential areas from the operations are not to exceed defined limits (assigned levels).

A summary of the applicable noise limits is provided in **Table 1.** These limits are determined from consideration of prevailing background noise levels and 'influencing factors' that considers the level of commercial and industrial zoning in the locality. The influencing factor (IF) considers zoning and road traffic around the nearest sensitive receiver of interest, within a 100 m and 450 m radius.

Table 1 Assigned noise level summary

Part of premises receiving noise	Time of day	Assigned level, dB		
		L_{A10}	L_{A1}	L_{Amax}
Noise Sensitive premises at locations within 15 metres of a building directly associated with a noise sensitive use	0700 to 1900 hours Monday to Saturday *('Day')*	45 + IF	55 + IF	65 + IF
	0900 to 1900 hours Sunday and public holidays *('Sundays')*	40 + IF	50 + IF	65 + IF
	1900 to 2200 hours all days *('Evening')*	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 Monday to Saturday and 0900 hours Sunday and public holidays *('Night')*	35 + IF	45 + IF	55 + IF
Noise Sensitive premises at locations further than 15 metres from a building directly associated with a noise sensitive use.	All hours	60	75	80
Commercial premises	All hours	60	75	80
Industrial and utility premises	All hours	65	80	90

Under the Regulations, if noise emitted from any premises when received at any other premises cannot reasonably be free of intrusive characteristics of tonality, modulation and impulsiveness, a series of adjustments are added to the emitted levels (measured or calculated) and the adjusted level must comply with the assigned level. The adjustments are detailed in **Table 2** and are further defined in Regulation 9(1) of the Regulations.

Table 2 Definition of noise characteristics

Noise characteristic	Definition	Adjustment if present (Note[1])
Tones	Where the difference between the A weighted sound pressure level in any one third octave ban and the arithmetic average of the A weighted sound pressure levels in the two adjacent one third octave bands is greater than 3 dB in terms of $L_{Aeq,T}$ where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as L_{ASlow} levels.	+5 dB
Modulation	A variation in the emission of noise that • is more than 3 dB LAFast or is more than 3 dB LAFast in any one third octave band; • is present for at least 10% of the representative assessment period; and, • is regular, cyclic and audible.	+5 dB
Impulsiveness	Present where the difference between the L_{APeak} and L_{Amax} is more than 15 dB when determined for single representative event.	+10 dB

Note 1: Where noise emission is not music, these adjustments are cumulative to a maximum of 15 dB

2.2 Construction

The 'Assigned Levels' of Table 1 of the Regulations are not applicable to construction noise as described in Regulation 13, under the following circumstances:

- For works occurring between 0700 hours and 1900 hours on any day which is not a Sunday or public holiday,
    - Works are carried out in accordance with control of environmental noise practices set out in section 4 of AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites;
    - Equipment used on the premises was the quietest reasonably available; and
    - Where a noise management plan is required to be prepared and approved by the local government CEO (CEO), works are carried out in accordance with the plan.
- For works occurring at all other hours,
    - Works are carried out in accordance with control of environmental noise practices set out in section 4 of AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites;
    - Equipment used on the premises was the quietest reasonably available;
    - Construction works are carried out in accordance with a noise management plan that was prepared and given to the CEO not later than 7 days before the construction work commenced, and approved by the CEO;
    - At least 24 hours before the construction work commenced, the occupier of the construction site gave written notice of the proposed construction work to the occupiers of all premises at which noise emissions received were likely to fail to comply with the noise limits provided in **Table 1**; and
    - It was reasonably necessary for the construction work to be carried out at that time.

Where construction is proposed to be carried out at periods other than 'weekdays' and construction noise may be significant to nearby receptors, construction contractors are required to develop and receive approval for a 'Construction Noise Management Plan' in accordance with Regulation 13.

3.0 Methodology

3.1 Sensitive receivers

The nearest sensitive residential receivers to the Project are presented in **Figure 1** and **Table 3**.

Table 3 Address / coordinates of nearest sensitive residential receivers

ID	Address / Geographical coordinates
R1	1534 Turkey Flat Rd, Kadathinni
R2	29°39'8.14"S 115°34'55.0"E
R3	3023 Three Springs-Eneabba Rd, Kadathinni
R4	2705 Three Springs-Eneabba Rd, Kadathinni
R5	29°44'09.0"S 115°29'09.9"E

Their influencing factors have been calculated to be zero because there is no commercial or industrial zoning, and no major or secondary roads within 450 metres of each receiver.

Should results at these receivers be modelled as compliant, results at receivers further away are also considered to be compliant.

3.2 Background Noise

The proposed development is within a broadacre farming area, consisting of cleared areas interspersed with areas of natural vegetation. The area is relatively sparsely populated, with a number of rural roads (paved and gravel), typically with intermittent traffic.

Background noise for similar rural areas measured within the Three Springs shire can be as low as 20 dB(A) during either day or night periods, when windspeed is low or calm.

There are no significant noise generating sites surrounding the proposed project, other than the intermittently used road network. Noise from vehicle activity on gazetted roads is not assessable under the *Environmental Protection (Noise) Regulations 1997.*

Due to the potential low background noise no adjustments for cumulative noise emissions are required under the Regulations for this project.

3.3 Noise prediction model

3.3.1 Source emission levels

Noise emissions from the BESS containers and inverters are mainly due to fan operation. All sources were conservatively modelled at 100% rating, but with different cooling fan speeds depending on the scenario (discussed further in **Section 3.3.2**).

Table 4 present**s** modelled noise sources to represent the equipment indicated in **Section 1.2**. These levels have been developed on the basis of supplied data and historical measurements of similar units.

Table 4 Modelled noise sources

Source	Quantity	Fan speed	A-weighted sound power level L_{wA}, per unit
BESS container	504	100%	94
		70%	77
BESS inverter	126	100%	98
		70%	93
PV inverter	114	100%	98
Transformer	4	100%	95

If required, the inverters' manufacturer (Power Electronics) has developed noise attenuation kits for the inverters. Based on a test report[1] received, measurements indicate that installing the kits would reduce inverter sound power levels L_W by 4 to 5 dB. These kits were not modelled in this assessment.

3.3.2 Scenarios

Table 5 presents the modelled scenarios. As mentioned in **Section 3.3.1**, the primary noise source of BESS and inverter units is the cooling fans fitted to the units.

Table 5 Modelled scenarios

Source	Fan speed		Notes
	Day and evening periods	Night period	
BESS container	100%	70%	Lower fan speeds were modelled during the night period on the basis of lower ambient temperatures.
BESS inverter	100%	70%	
PV inverter	100%	0%	Fans were not modelled to run on the basis that the solar farm (and hence inverter) is not operational without sunlight. Where there is minimal sunlight during sunrise, fan speeds are considered minimal on the basis of low ambient temperatures.
Transformer	100%	100%	Conservatively modelled at 100% duty for both periods.

3.3.3 Environmental propagation

The model applied the CONCAWE prediction method within SoundPLAN v8.2 software for calculating the outdoor noise propagation given the distances involved. Both the software and the CONCAWE method are widely applied in Australia for the prediction of noise from fixed industrial premises over these distances.

[1] TN0058CI, Noise Reduction for PCSM GEN3 Inverters, Revision C, dated April 24, 2024.

- Equipment on site were modelled in terms of their ability to block and/or reflect noise towards the identified sensitive receivers.
- Ground surfaces were modelled as 60% absorptive considering the coverage of grass as well as landscaped and loose soil in the area.
- In the day and evening period scenario, noise-enhancing meteorological conditions were adopted with light (4 m/s) downwind (source to receiver) conditions and Pasquil stability category E.
- In the night period scenario, noise-enhancing meteorological conditions were adopted with light (3 m/s) downwind (source to receiver) conditions and Pasquil stability category F.

The model was used to predict noise levels at the sensitive receivers identified in **Section 3.1**. Should noise levels at these receivers be modelled as compliant, noise received at all other receivers further away are regarded as compliant.

3.4 Uncertainty of prediction

The expected level of prediction uncertainty as estimated according to the ISO Guide to Measurement Uncertainty is outlined in **Table 6**.

Table 6 Estimated prediction uncertainty by system

Parameter	System	U_{95} (Note [1])	Student's t-factor
Airborne noise, L_{A10}	CONCAWE	7 dB	1.99

Note 1: The U_{95} is the expanded uncertainty of measurement for a 95% confidence interval. It represents the estimated range in which the true value lies for 95 out of 100 repeated events.

4.0 Results and discussion

4.1 Operational noise

Based on information received to date, **Table 7** presents the predicted levels at the nearest sensitive receivers, and indicates that noise emissions from the Project comply with the Regulations for the day, evening and night periods.

Table 7 Predicted noise levels at sensitive receivers

Receiver	Day and evening period			Night period		
	Assigned level	Predicted L_{A10}	Result	Assigned level	Predicted L_{A10}	Result
R1	40	35	OK	35	34	OK
R2	40	31	OK	35	30	OK
R3	40	<30	OK	35	<30	OK
R4	40	<30	OK	35	<30	OK
R5	40	<30	OK	35	<30	OK

We note that this assessment is based on design information as provided. If significant changes to the equipment or layout are made, the noise emissions of the modified design or equipment should be reviewed.

4.2 Construction noise

It is expected that construction works would only be carried out between 0700 hours and 1900 hours on any day which is not a Sunday or public holiday.

Hence, as per **Section 2.2**, noise emissions from construction works can be compliant under the Regulations. A noise management plan can be prepared should it be requested by the CEO.

Appendix A L_{A10} noise contours

Killawarra Solar and BESS

Noise Assessment

Trina Solar

Report 675.072651.00001

1 April 2025

Figure 3 Day operation noise contours, L_{A10} dB

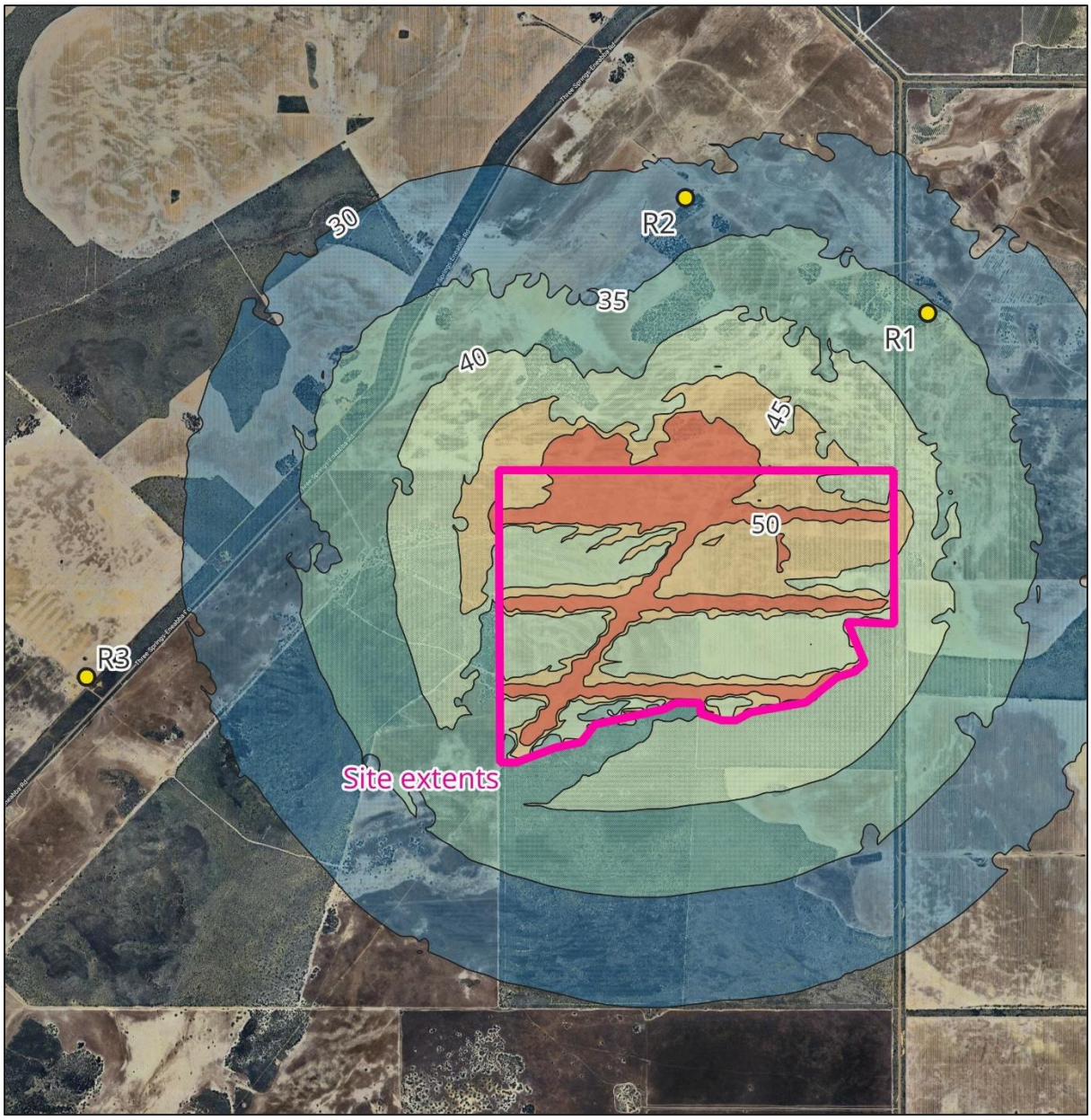
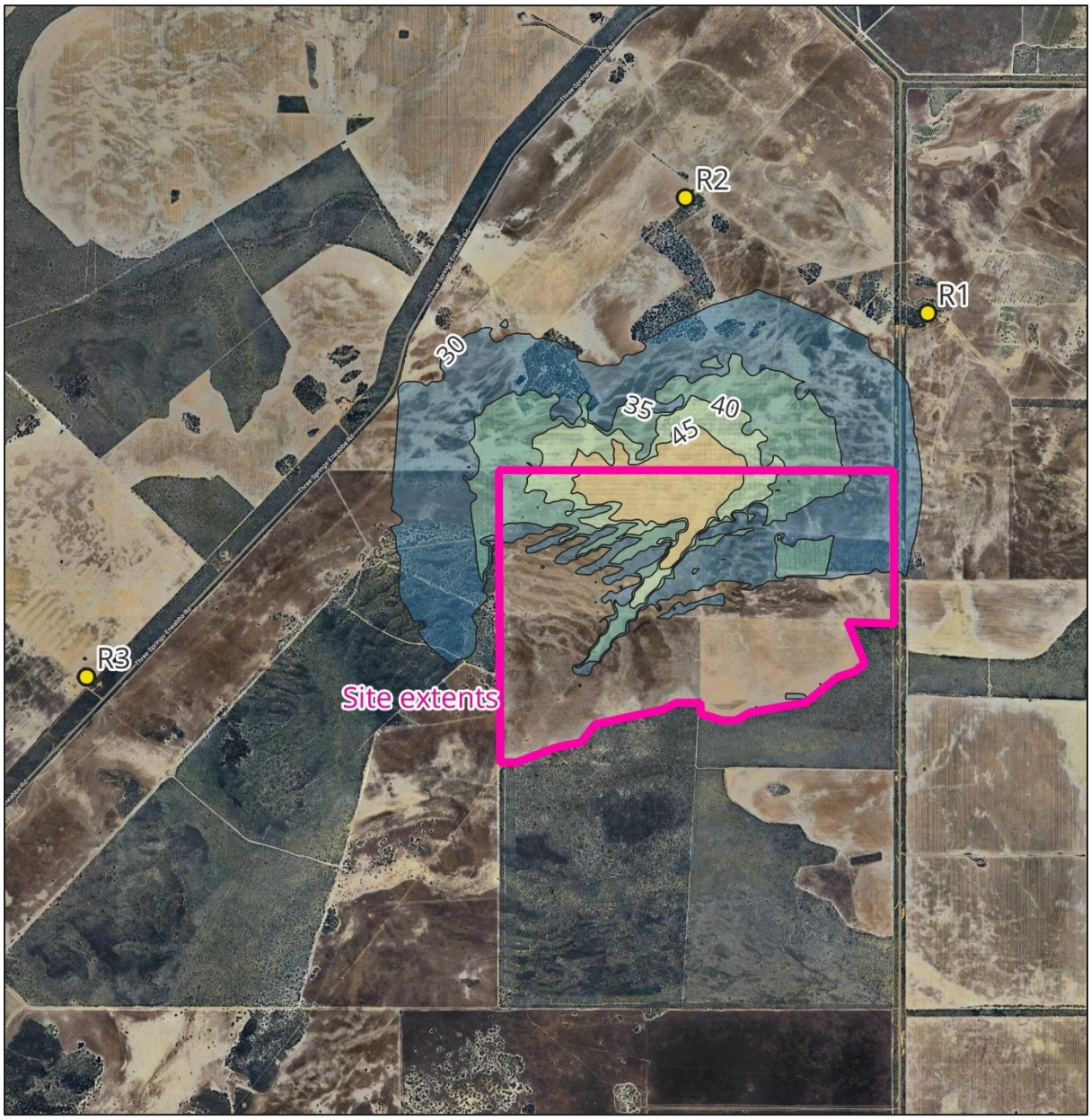
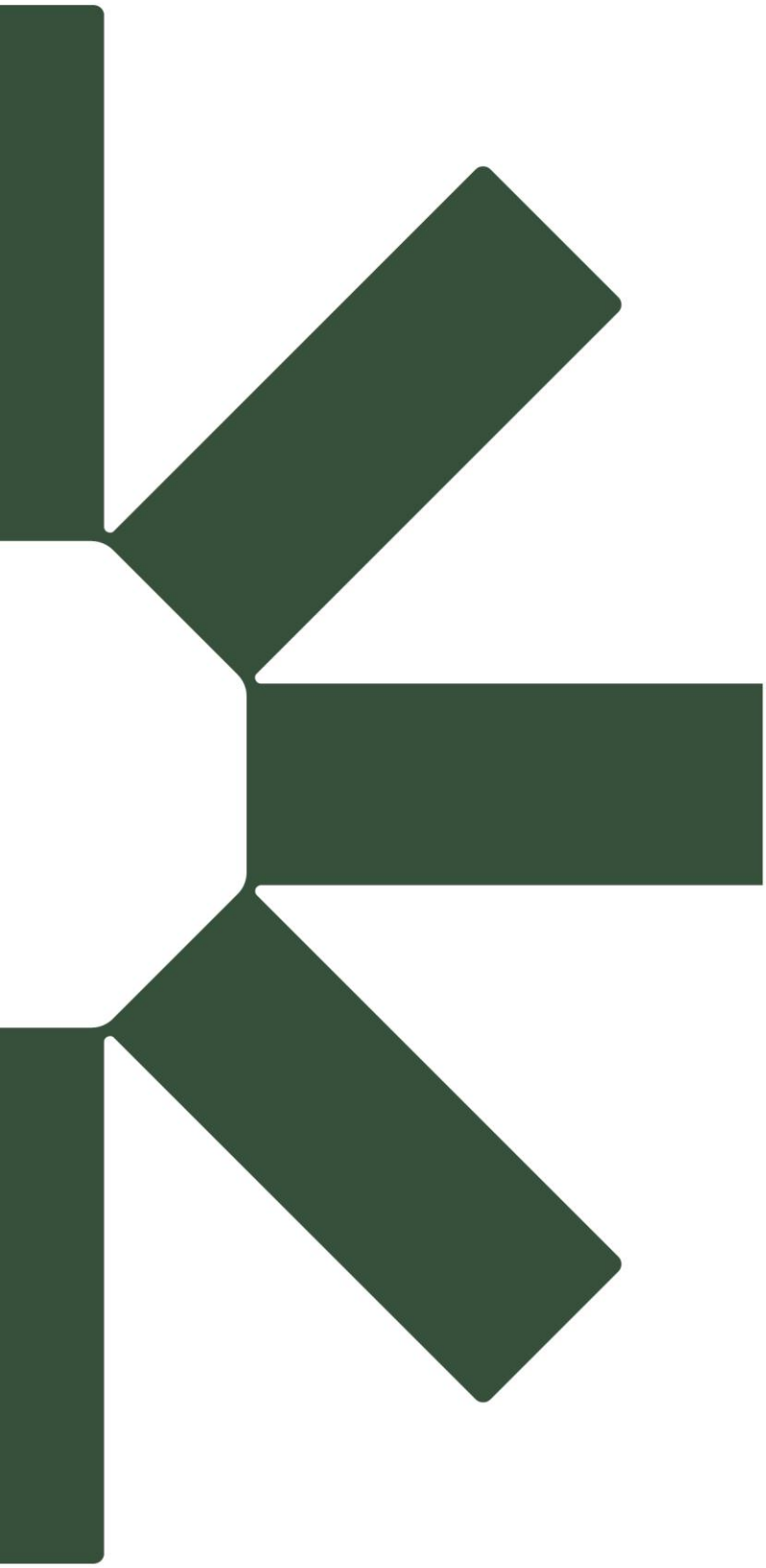


Figure 4 Night operation noise contours, L_{A10} dB





Making Sustainability Happen

Appendix D – Noise Assessment Report

Updated Version - 7 August 2025

Killawarra Solar and BESS

Noise Assessment

Trina Solar

1 Farrer Pl
Sydney NSW 2000

Prepared by:

SLR Consulting Australia

Report 675.072651.00001

7 August 2025

Revision: 03

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
03	7 August 2025	P. Drew	L. Zoontjens	P. Drew
02	1 April 2025	Wei Kiat Yeo	P. Drew	P. Drew
003	25 March 2025	Wei Kiat Yeo	P. Drew	P. Drew
0	15 November 2024	Wei Kiat Yeo	P. Drew	P. Drew

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Trina Solar (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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Trina Solar is proposing to build a solar farm and battery energy storage system (BESS) project within the Shire of Three Springs.

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A noise model was developed based on preliminary plans, supplied information and historical measurements to predict noise levels at the nearest sensitive receivers. These predictions were assessed against the relevant targets to determine the potential for compliance with the *Environmental Protection (Noise) Regulations 1997* ('the Regulations').

Noise emissions from the Project are predicted to comply with the Regulations.

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Appendices

Appendix A L_{A10} noise contours

1.0 Introduction

Trina Solar is proposing to build a solar farm and battery energy storage system (BESS) project (the 'Project').

SLR has been engaged by Trina Solar to undertake a noise assessment of construction and operational activities of the Project to determine the level of compliance with state noise regulations.

1.1 Site locality

The Project is located within the Shire of Three Springs – approximately 24 km southwest of the town of Three Springs.

Figure 1 presents an aerial image of the site, annotated to indicate the nearest sensitive receivers.

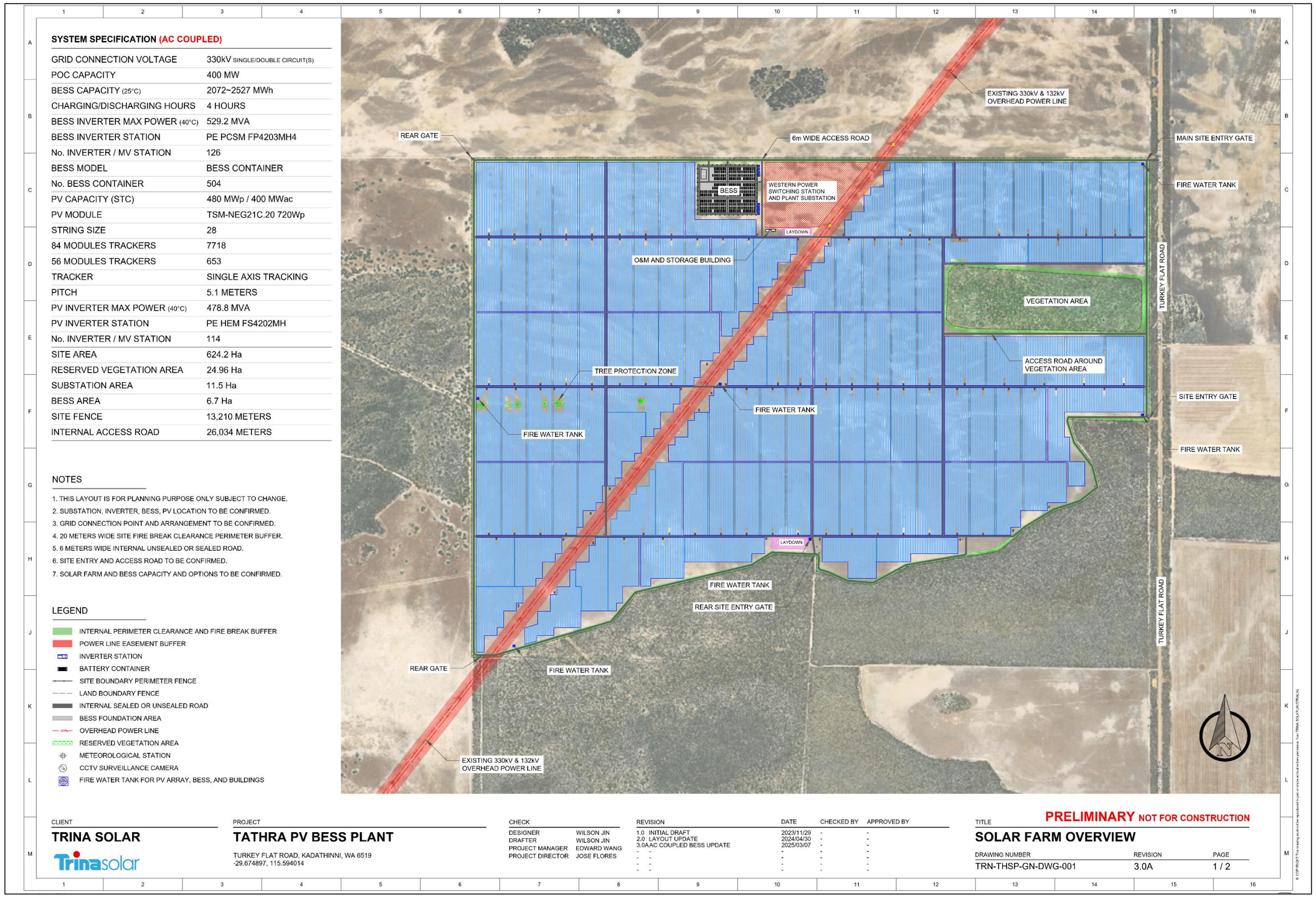
Figure 1 Aerial image annotated to indicate nearest sensitive receivers



1.2 Site plan

Figure 2 presents a preliminary drawing indicating an overview of the Project.

Figure 2 Preliminary drawing indicating an overview of the Project (drawing number TRN-THSP-GN-DWG-001, dated 30th April, 2024)



Based on **Figure 2** and information received, key equipment on site consists of the following:

- 504x BESS containers
- 126x BESS inverters (model PE PCSM FP4203MH4)
- 114x PV inverters (model PE HEM FS4202MH)
- 4x 240 MVA transformers (based on email dated 16 October 2024)

2.0 Criteria

2.1 Operation

Environmental noise emissions in Western Australia are regulated under the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations) ('the Regulations'). Generally, to achieve compliance with the Regulations, noise levels at nearby residential areas from the operations are not to exceed defined limits (assigned levels).

A summary of the applicable noise limits is provided in **Table 1.** These limits are determined from consideration of prevailing background noise levels and 'influencing factors' that considers the level of commercial and industrial zoning in the locality. The influencing factor (IF) considers zoning and road traffic around the nearest sensitive receiver of interest, within a 100 m and 450 m radius.

Table 1 Assigned noise level summary

Part of premises receiving noise	Time of day	Assigned level, dB		
		L_{A10}	L_{A1}	L_{Amax}
Noise Sensitive premises at locations within 15 metres of a building directly associated with a noise sensitive use	0700 to 1900 hours Monday to Saturday *('Day')*	45 + IF	55 + IF	65 + IF
	0900 to 1900 hours Sunday and public holidays *('Sundays')*	40 + IF	50 + IF	65 + IF
	1900 to 2200 hours all days *('Evening')*	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 Monday to Saturday and 0900 hours Sunday and public holidays *('Night')*	35 + IF	45 + IF	55 + IF
Noise Sensitive premises at locations further than 15 metres from a building directly associated with a noise sensitive use.	All hours	60	75	80
Commercial premises	All hours	60	75	80
Industrial and utility premises	All hours	65	80	90

Under the Regulations, if noise emitted from any premises when received at any other premises cannot reasonably be free of intrusive characteristics of tonality, modulation and impulsiveness, a series of adjustments are added to the emitted levels (measured or calculated) and the adjusted level must comply with the assigned level. The adjustments are detailed in **Table 2** and are further defined in Regulation 9(1) of the Regulations.

Table 2 Definition of noise characteristics

Noise characteristic	Definition	Adjustment if present (Note[1])
Tones	Where the difference between the A weighted sound pressure level in any one third octave ban and the arithmetic average of the A weighted sound pressure levels in the two adjacent one third octave bands is greater than 3 dB in terms of $L_{Aeq,T}$ where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as L_{ASlow} levels.	+5 dB
Modulation	A variation in the emission of noise that • is more than 3 dB LAFast or is more than 3 dB LAFast in any one third octave band; • is present for at least 10% of the representative assessment period; and, • is regular, cyclic and audible.	+5 dB
Impulsiveness	Present where the difference between the L_{APeak} and L_{Amax} is more than 15 dB when determined for single representative event.	+10 dB

Note 1: Where noise emission is not music, these adjustments are cumulative to a maximum of 15 dB

2.2 Construction

The 'Assigned Levels' of Table 1 of the Regulations are not applicable to construction noise as described in Regulation 13, under the following circumstances:

- For works occurring between 0700 hours and 1900 hours on any day which is not a Sunday or public holiday,
  - Works are carried out in accordance with control of environmental noise practices set out in section 4 of AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites;
  - Equipment used on the premises was the quietest reasonably available; and
  - Where a noise management plan is required to be prepared and approved by the local government CEO (CEO), works are carried out in accordance with the plan.
- For works occurring at all other hours,
  - Works are carried out in accordance with control of environmental noise practices set out in section 4 of AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites;
  - Equipment used on the premises was the quietest reasonably available;
  - Construction works are carried out in accordance with a noise management plan that was prepared and given to the CEO not later than 7 days before the construction work commenced, and approved by the CEO;
  - At least 24 hours before the construction work commenced, the occupier of the construction site gave written notice of the proposed construction work to the occupiers of all premises at which noise emissions received were likely to fail to comply with the noise limits provided in **Table 1**; and
  - It was reasonably necessary for the construction work to be carried out at that time.

Where construction is proposed to be carried out at periods other than 'weekdays' and construction noise may be significant to nearby receptors, construction contractors are required to develop and receive approval for a 'Construction Noise Management Plan' in accordance with Regulation 13.

3.0 Methodology

3.1 Sensitive receivers

The nearest sensitive residential receivers to the Project are presented in **Figure 1** and **Table 3**.

Table 3 Address / coordinates of nearest sensitive residential receivers

ID	Address / Geographical coordinates
R1	1534 Turkey Flat Rd, Kadathinni
R2	29°39'8.14"S 115°34'55.0"E
R3	3023 Three Springs-Eneabba Rd, Kadathinni
R4	2705 Three Springs-Eneabba Rd, Kadathinni
R5	29°44'09.0"S 115°29'09.9"E

Their influencing factors have been calculated to be zero because there is no commercial or industrial zoning, and no major or secondary roads within 450 metres of each receiver.

Should results at these receivers be modelled as compliant, results at receivers further away are also considered to be compliant.

3.2 Background Noise

The proposed development is within a broadacre farming area, consisting of cleared areas interspersed with areas of natural vegetation. The area is relatively sparsely populated, with a number of rural roads (paved and gravel), typically with intermittent traffic.

Background noise for similar rural areas measured within the Three Springs shire can be as low as L_{Aeq} 20 dB(A) during either day or night periods, when windspeed is low or calm.

There are no significant noise generating sites surrounding the proposed project, other than the intermittently used road network. Noise from vehicle activity on gazetted roads is not assessable under the *Environmental Protection (Noise) Regulations 1997.*

Due to the potential for low background noise, no adjustments for cumulative noise emissions under the Regulations have been applied for this project.

3.3 Noise prediction model

3.3.1 Source emission levels

Noise emissions from the BESS containers and inverters are mainly due to fan operation. Noise sources were modelled at different loading, depending on the scenario (discussed further in **Section 3.3.2**).

Table 4 presents modelled noise sources to represent the equipment indicated in **Section 1.2**. These levels have been developed on the basis of supplied data and historical measurements of similar units.

Table 4 Modelled noise sources

Source	Quantity	Load	A-weighted sound power level $L_{wA,}$ per unit
BESS container	504	100%	94
		70%	77
BESS inverter	126	100%	98
		70%	93
PV inverter	114	100%	98
Transformer	4	100%	95

Equipment sound power data has been provided by the client based on sound power testing to ISO3744:2010, including third-octave spectral data. Transformer sound power has been extracted from file data for equivalent size substation transformers measured in Western Australia.

If required, the inverters' manufacturer (Power Electronics) has developed noise attenuation kits for the inverters. Based on a test report[1] received, measurements indicate that installing the kits would reduce inverter sound power levels (L_{wA} basis) by 4 to 5 dB. These kits were not modelled in this assessment.

3.3.2 Scenarios

Table 5 presents the modelled scenarios. As mentioned in **Section 3.3.1**, the primary noise source of BESS and inverter units is the cooling fans fitted to the units.

Table 5 Modelled scenarios

Source	Loading		Notes
	Day and evening periods	Night period	
BESS container	100%	70%	Lower fan speeds were modelled during the night period on the basis of lower ambient temperatures.
BESS inverter	100%	70%	
PV inverter	100%	0%	Fans were not modelled to run on the basis that the solar farm (and hence inverter) is not operational without sunlight. Where there is minimal sunlight during sunrise, fan speeds are considered minimal on the basis of low ambient temperatures.
Transformer	100%	100%	Conservatively modelled at 100% duty for both periods.

3.3.3 Environmental propagation

The model applied the CONCAWE prediction method within SoundPLAN v8.2 software for calculating the outdoor noise propagation given the distances involved. Both the software and the CONCAWE method are widely applied in Australia for the prediction of noise from fixed industrial premises over these distances.

[1] TN0058CI, Noise Reduction for PCSM GEN3 Inverters, Revision C, dated April 24, 2024.

- Equipment on site were modelled in terms of their ability to block and/or reflect noise towards the identified sensitive receivers.
- Ground surfaces were modelled as 60% absorptive considering the coverage of grass as well as landscaped and loose soil in the area.
- In the day and evening period scenario, noise-enhancing meteorological conditions were adopted with light (4 m/s) downwind (source to receiver) conditions and Pasquil stability category E.
- In the night period scenario, noise-enhancing meteorological conditions were adopted with light (3 m/s) downwind (source to receiver) conditions and Pasquil stability category F.

The model was used to predict noise levels at the sensitive receivers identified in **Section 3.1**. Should noise levels at these receivers be modelled as compliant, noise received at all other receivers further away are regarded as compliant.

3.4 Uncertainty of prediction

The expected level of prediction uncertainty as estimated according to the ISO Guide to Measurement Uncertainty is outlined in **Table 6**.

Table 6 Estimated prediction uncertainty by system

Parameter	System	U_{95} (Note [1])	Student's t-factor
Airborne noise, L_{A10}	CONCAWE	7 dB	1.99

Note 1: The U_{95} is the expanded uncertainty of measurement for a 95% confidence interval. It represents the estimated range in which the true value lies for 95 out of 100 repeated events.

4.0 Results and discussion

4.1 Operational noise

Based on information received to date, **Table 7** presents the predicted levels at the nearest sensitive receivers, and indicates that noise emissions from the Project comply with the Regulations for the day, evening and night periods.

Table 7 Predicted noise levels at sensitive receivers

Receiver	Day and evening period			Night period		
	Assigned level	Predicted L_{A10}	Result	Assigned level	Predicted L_{A10}	Result
R1	40	35	OK	35	26	OK
R2	40	31	OK	35	22	OK
R3	40	<30	OK	35	17	OK
R4	40	<30	OK	35	<15	OK
R5	40	<30	OK	35	<15	OK

We note that this assessment is based on design information as provided. If significant changes to the equipment or layout are made, the noise emissions of the modified design or equipment should be reviewed.

4.2 Construction noise

It is expected that construction works would only be carried out between 0700 hours and 1900 hours on any day which is not a Sunday or public holiday.

Hence, as per **Section 2.2**, noise emissions from construction works can be compliant under the Regulations. A noise management plan can be prepared should it be requested by the CEO.

Appendix A L_{A10} noise contours

Killawarra Solar and BESS

Noise Assessment

Trina Solar

Report 675.072651.00001

7 August 2025

Figure 3 Day operation noise contours, L_{A10} dB

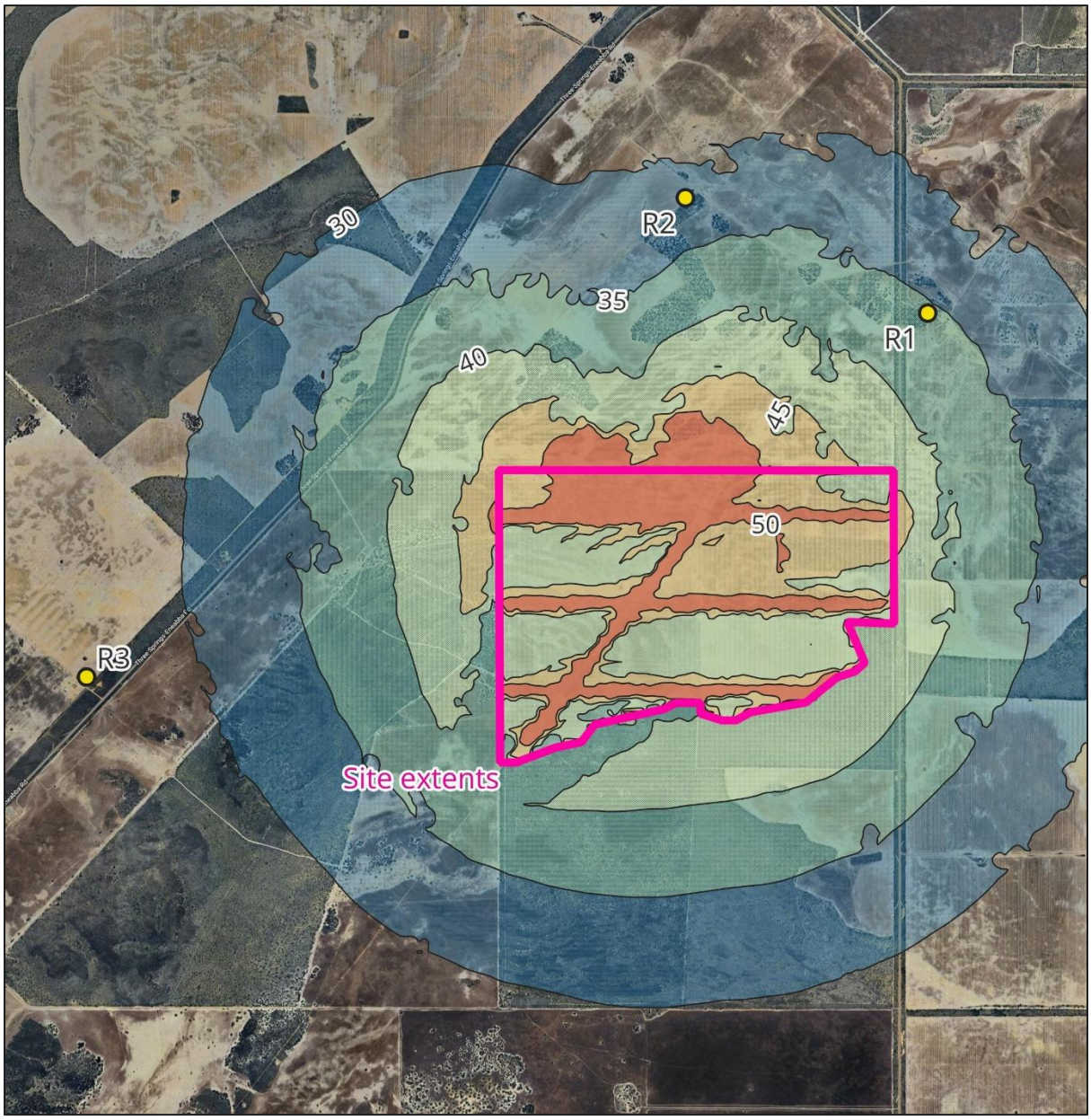
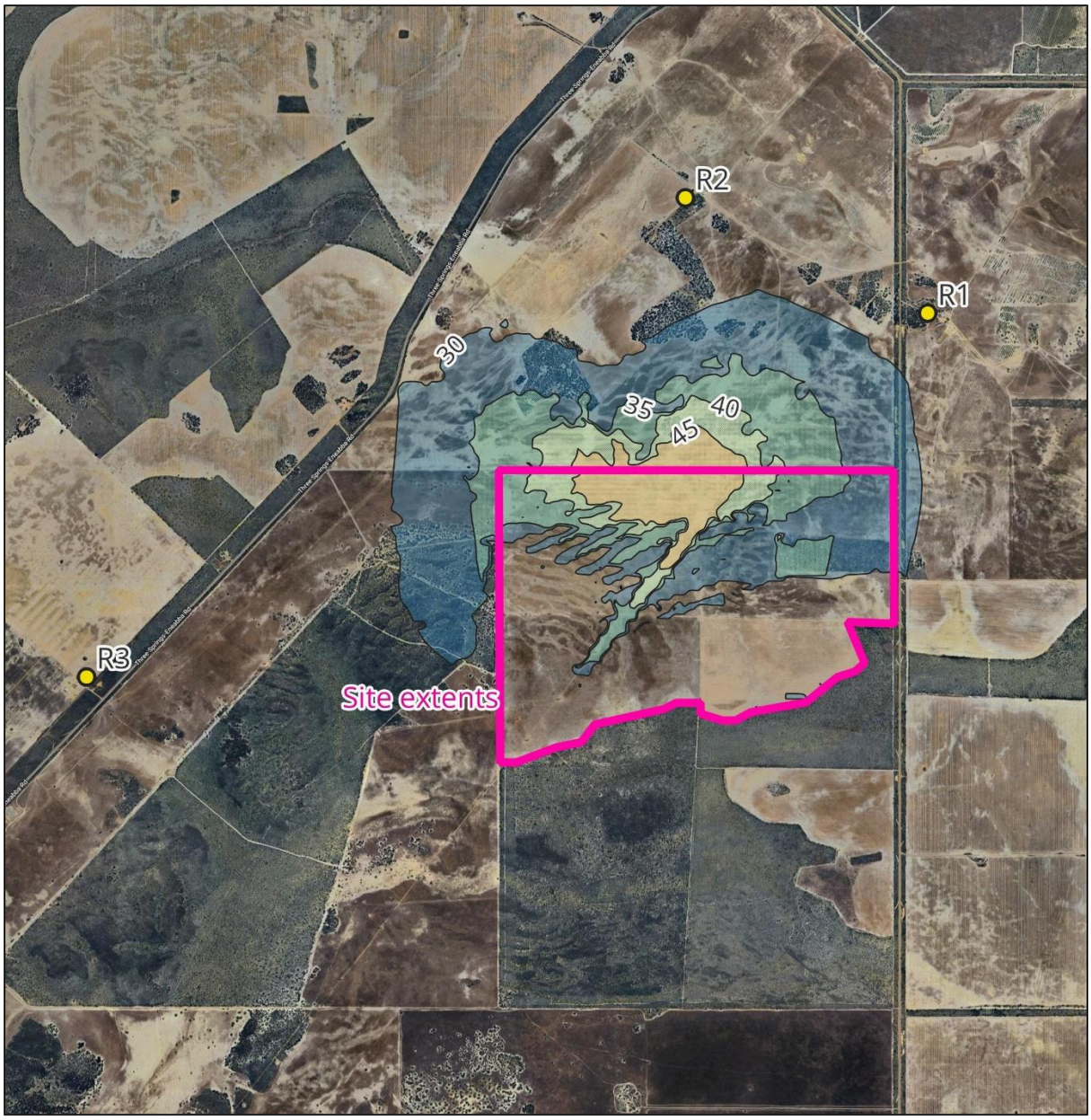
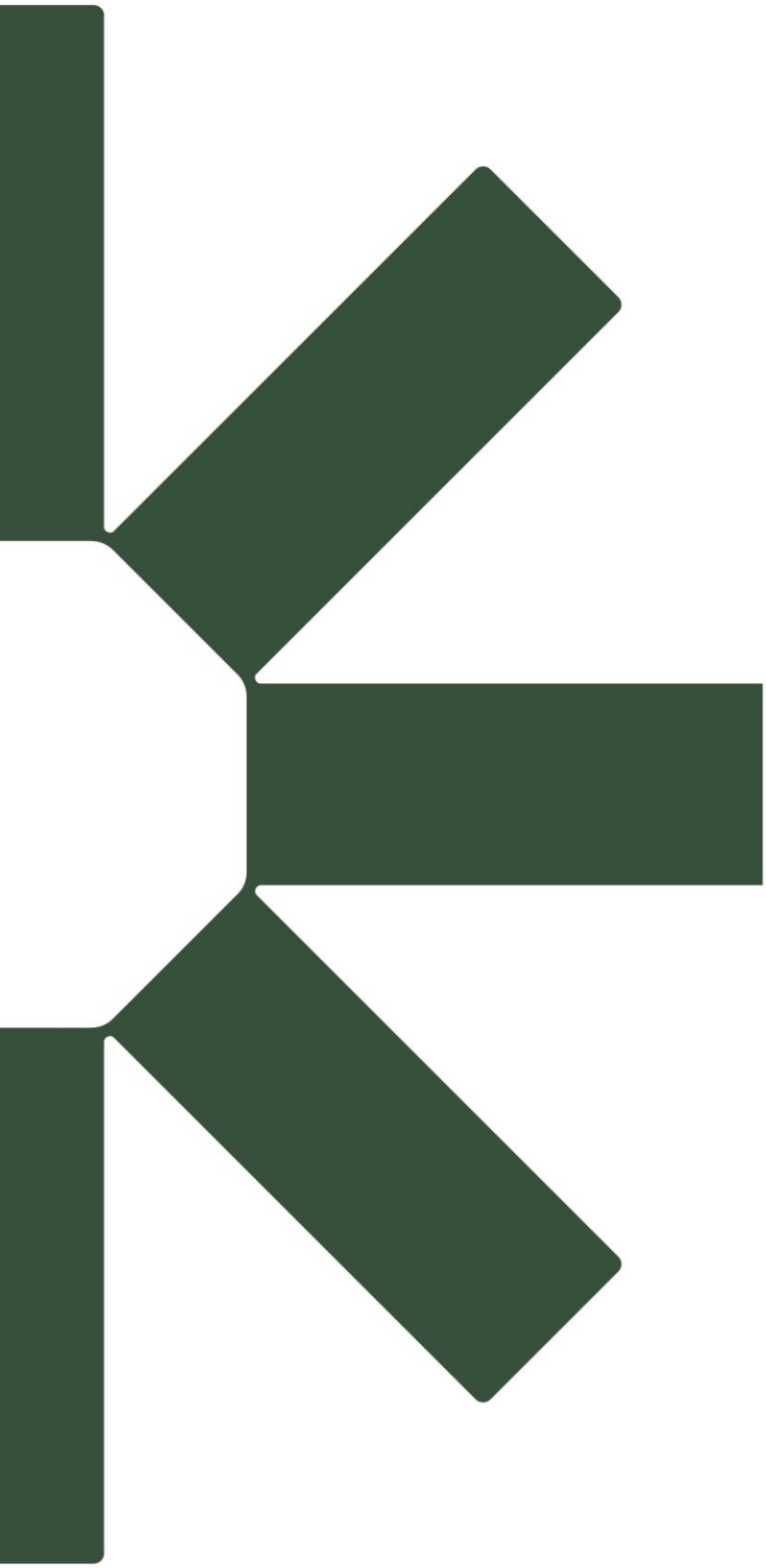


Figure 4 Night operation noise contours, L_{A10} dB





Making Sustainability Happen

Appendix E – Traffic Impact Assessment

Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project

Transport Impact Assessment

Trina Solar

1 Farrer Place, Sydney NSW 2000

Prepared by:

SLR Consulting Australia

SLR Project No.: 675.072651.00007

1 April 2025

Revision: 2.3

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
2.3	1 April 2025	James Cochrane	Charlie Seventekin	Genelle Abolis

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Trina Solar (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Trina Solar (or The Applicant) to provide traffic and transport engineering input to support the proposed Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project Project (Project) in Turkey Flat Road, Kadathinni, WA.

The Project proposes a 400-megawatt (MW) solar farm and a 586 MW (discharge rate) / 2,072 MWh to 2,527 MWh (energy storage capacity) BESS to be constructed at Turkey Flat Road, which is located approximately 255 km north-east of Perth, WA and 137 km south-east of Geraldton, WA. The Project will comprise the following:

- The construction of a 400 MW solar farm comprising solar photovoltaic (PV) solar panels arranged in a series of rows. The number of PV solar panels would depend on the detailed design, available technology, and final capacity available when finalising the connection agreement with the WA Government.
- Construction/ installation of a centralised BESS with a capacity between 2,072 MWh and 2,527 MWh.
- The construction and operation of a transmission substation and switching yard.
- Installation of electrical collection and conversion systems, including inverter and transformer units, switchyard, and control room.
- Connection to the existing 330 kV transmission line that traverses the site via the proposed switching yard.

This Traffic Impact Assessment (TIA) will form a part of the DA preparation process. Based on the analysis and discussion documented in this report, the following is concluded:

- It is proposed that vehicular access to/ from the development will be provided via Turkey Flat Road.
- The Project will generate additional traffic of approximately 13,907 inbound and 13,907 outbound trips during the assumed construction period of 12 months or 312 workdays. The anticipated construction duration is, in fact, 15-18 months; however, for a conservative traffic assessment, all calculations in this report were based on a period of 12 months, which intensifies the daily traffic generation and, therefore, a conservative assessment. As a result, the daily traffic generation is anticipated to be in the order of 44-45 inbound and 44-45 outbound trips a day. It is worth noting that, due to the conservativeness built into SLR's assessment, this is expected to be the worst-case peak traffic.
- It was identified that the intersections of Brand Highway/ Eneabba-Three Springs Road and Eneabba-Three Springs Road/ Turkey Flat Road will continue operating satisfactorily during the construction of the project.
- It is anticipated that no rail corridors or crossings will be impacted.
- Based on the turn warrant assessments, it is concluded that the existing configurations of Brand Highway/ Eneabba-Three Springs Road and Eneabba-Three Springs Road/ Turkey Flat Road intersections are sufficient to accommodate the construction traffic.
- Intersection performance analysis was undertaken at four study intersections (two existing intersections and two proposed new site access driveways). Based on this analysis, it is concluded that the road network, in its existing form, will accommodate the traffic impacts of the proposed project.

- The publicly available crash dataset for the surroundings of the development site does not indicate any recurring crash type or theme that would preclude or warrant significant safety mitigations.
- Sight distances available at the Brand Highway/ Eneabba-Three Springs Road and Eneabba-Three Springs Road/ Turkey Flat Road intersections exceed the Safe Intersection Sight Distance (SISD) requirements of the Austroads Guidelines.

As per the analysis provided in this report, the following is recommended:

1 The Eneabba-Three Springs Road/ Turkey Flat Road intersection be upgraded with BAR and BAL treatments to improve road safety. It is also recommended that the Applicant continue consultation with the Council regarding the intersection upgrades.

2 Although not strictly necessary, one design vehicle's length (27.5m) be sealed on Turkey Flat Road at the Eneabba-Three Springs Road intersection (southeastern leg of the intersection) to minimise and mitigate the migration of gravel from Turkey Flat Road onto Eneabba-Three Springs Road.

3 A construction traffic management plan (CTMP) is to be prepared following the approval of the DA.

4 The construction workforce is briefed on the recommended route with a Drivers' Code of Conduct prepared by the applicant. During construction, 60 km/h speed restrictions for B-Double design vehicles should be followed on Turkey Flat Road.

5 An Oversize and Over Mass (OSOM) material route study be prepared following the approval of this DA.

6 Dilapidation reports be prepared for the review of the Council.

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1.0 Introduction

1.1 Context

Trina Solar (or The Applicant) has engaged SLR Consulting (Australia) Pty Ltd (SLR) to prepare a Transport Impact Assessment (TIA) for the proposed Killawarra Solar Farm, BESS and substation project in Three Springs, Western Australia (WA).

The project proposes the construction and operation of a solar farm and BESS facility with a solar farm capacity of 400MW and a BESS electrical storage capacity of 2,072 MWh to 2,527 MWh, rated at 586MW (4 hours).

The proposed solar farm and BESS development will comprise 504 BESS containers, 710W solar panels, one substation and associated electrical equipment (i.e. transformer, switch yard). The development will also provide a 100m long 330kV high voltage transmission line connecting the development with the external power network that runs through the project site. Ancillary elements of the development include internal access tracks and temporary construction facilities. The development plans prepared by Trina Solar are reproduced in **Appendix A**.

1.2 Application

This TIA has been prepared to inform the Regional Planning Assessment Panel and Shire of Three Springs (STS) to assess and determine the Development Application (DA) for the project.

This report has been prepared in accordance with Main Roads WA (MRWA) *"Transport Impact Assessment Guidelines 2016"*. It is also worth noting that several references have been made to Austroads Guidelines and relevant Australian Standards.

1.3 Assessment Scope

This TIA report assesses the consistency of the development with Council and State planning and evaluates the impacts of the proposed Killawarra Solar Farm, BESS and Substation project on the surrounding transport network. This TIA identifies the transport infrastructure required to support the development and provides an assessment of the traffic- and transport-specific aspects of the development against the requirements of the following relevant authorities:

- WAPC.
- Statutory Planning Committee (SPC).
- MRWA.
- STS.

It is understood that the application will be assessed by the Development Assessment Panel at the Department of Planning, Lands and Heritage (DPLH) WA, in conjunction with the Council and in line with the statutory requirements under the Three Springs Planning Scheme.

1.4 Report Structure

The structure of this TIA report is shown in **Table 1**.

Table 1 TIA Report Structure

Section	Title	Description
1	Introduction	Identifies the context of the project.
2	Project Description	Describes the project, including location, site design, and access arrangements.
3	Existing Conditions Appraisal	Describes the existing transport network, including traffic volumes, crash history, bus service, and heavy vehicle routes.
4	Project Traffic Demands	Details the project generated traffic demands and assessed traffic volumes.
5	Traffic Engineering Considerations	Outlines the technical analysis undertaken to confirm the appropriateness of the Project from a traffic engineering perspective.
6	Operational Assessment	Outlines the technical analysis to assess the capacity of the site access intersection and surrounding road network.
7	Construction Traffic Management Strategies	Outlines the possible strategies for the future construction traffic management plan and provides high-level advice.
8	Recommendations	Outlines the recommended actions for the applicant following the lodgement of the SSD application.
9	Conclusion	Summarises the findings of the assessment and recommends approval conditions.

2.0 Project Description

2.1 Overview

The applicant proposes constructing and operating a 400 MW solar farm with a 586 MW/ 2,072 MWh to 2,527 MWh BESS and an electrical substation for grid connection to generate electricity. The Project site is located adjacent to Turkey Flat Road, Kadathinni WA and contained within the following lot numbers:

- Lot 10896 of DP210818.
- Lot 10897 of DP210818.

Figure 1 and **Figure 2** provide an overview of the Project site location. The Project site is located within the locality of Kadathinni, approximately 24km northeast of Three Springs, WA. It is situated in the Shire of Three Springs Local Government Area (LGA) and is zoned for "Rural Landscape" under the STS Local Planning Strategy (LPS) 2010.

Turkey Flat Road is an unsealed local road along the site's eastern boundary that intersects with Eneabba-Three Springs Road at its northern end. Other rural land properties form the north, south and western boundaries.

The Project will consist of photovoltaic (PV) panel arrays supported by galvanised steel piles that will typically be either driven or screwed into place. Based on the currently available PV panel technology, it is estimated that 560,000 panels will be transported to the subject land in addition to the supporting infrastructure required.

Figure 1 below provides an overview of the site location in the regional context.

Figure 1 Site Location in the Regional Context

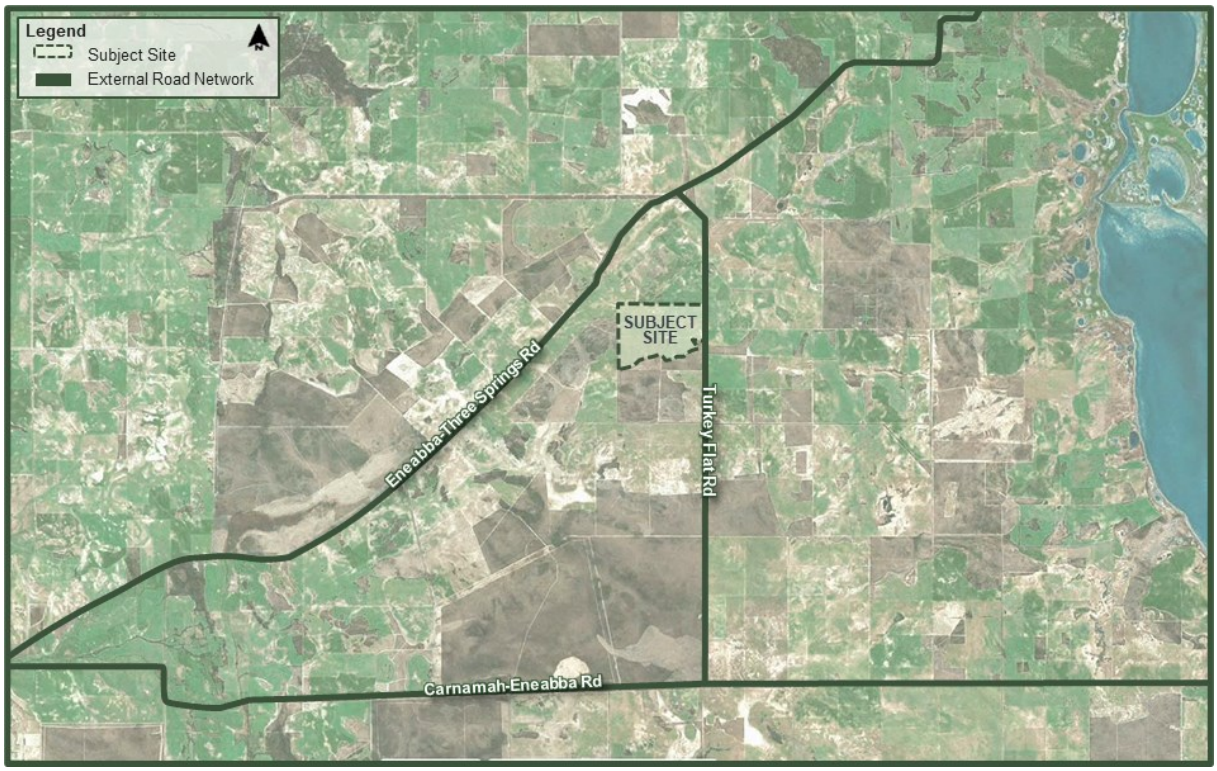
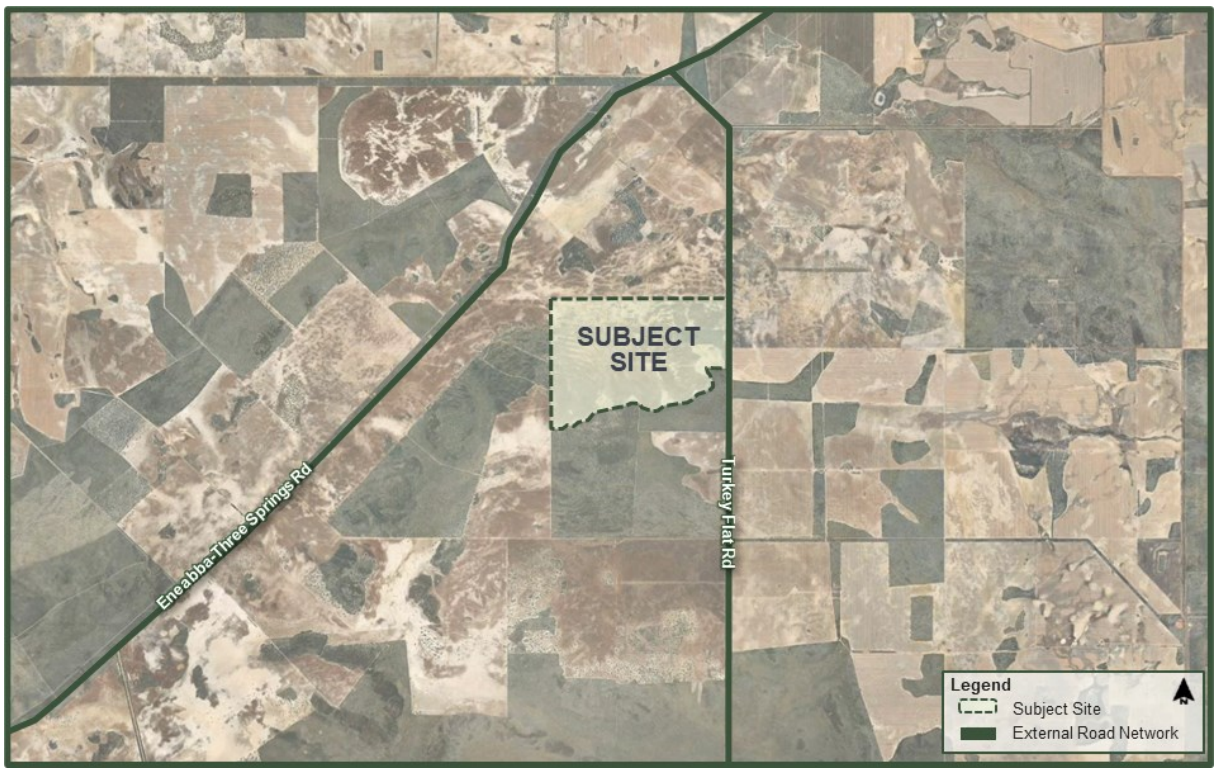


Figure 2 overleaf provides an overview of the site location in the local context.

Figure 2 Site Location in the Local Context



2.2 Project Program

2.2.1 Construction Phase

The Applicant has advised that the development will be constructed over 15-18 months, with construction commencing in 2027. However, for a conservative traffic assessment, a 12-month construction period has been assumed.

Based on the information obtained from the Applicant, it was understood that construction works would be undertaken at a steady rate. Therefore, a linear traffic generation estimate has been applied for the construction movements associated with material, equipment, workforce mobilisation and decommissioning. The development will be decommissioned and rehabilitated at the end of its operational life.

It is important to note that the construction scenario of any solar farm, BESS and substation development has the largest traffic impacts compared to their impacts during the operation and demobilisation phases. Based on this, no detailed assessments are undertaken for the operational and demobilisation phases.

2.2.2 Operation and Decommissioning Phase

The development is expected to operate for approximately 25-30 years, providing short-, medium- and long-term local employment opportunities.

Western Power is expected to deliver, own, and operate the solar farm, BESS, substation development and transmission infrastructure. Before commissioning, the TNSP will formally take possession of the required grid connection assets and interests to own and operate.

At the end of the project's operational life, The Applicant, as the consent holder, will be responsible for decommissioning and rehabilitating the solar farm and BESS development, including the collector substation, transmission line and switching station.

The operation and decommissioning processes will generate much less traffic than the construction period since solar farms and BESS facilities are low-maintenance equipment (operational traffic).

2.3 Site Access

The Project will be located on land adjacent to Turkey Flat Road. The Project is located north and west of Eneabba-Three Springs Road, with the northern extent of the site being approximately 1.4km south of Eneabba-Three Springs Road. It is proposed that the site will have two different access locations along Turkey Flat Road for the purposes of construction traffic. **Figure 3** overleaf provides an overview of the Project site access locations.

During their inbound journeys, all construction materials (mostly heavy vehicles) are anticipated to approach the site from Brand Highway, travelling in the southbound direction (i.e. from Geraldton) and turn left onto Eneabba-Three Springs Road using the existing left-turn deceleration lane provided on Brand Highway.

During their inbound journeys, the workforce (mostly small buses/ VANs/ UTEs) is anticipated to approach the site from the following directions with the proportions estimated below:

- 70% from East on Eneabba-Three Springs Road from Three Springs, Carnamah and Mingenew.
- 15% from North on Brand Highway from various towns between Eneabba and Geraldton.
- 15% from South on Brand Highway from various towns between Eneabba and Perth.

All light and heavy vehicles will continue to travel along Eneabba-Three Springs Road until they reach Turkey Flat Road, where they will perform a right turn or left turn onto Turkey Flat Road before travelling in the southbound direction until they reach the project site. It should be noted that the applicant is committed to providing upgrades at the Eneabba-Three Springs Road/ Turkey Flat Road intersection. More information on this is provided later in this document.

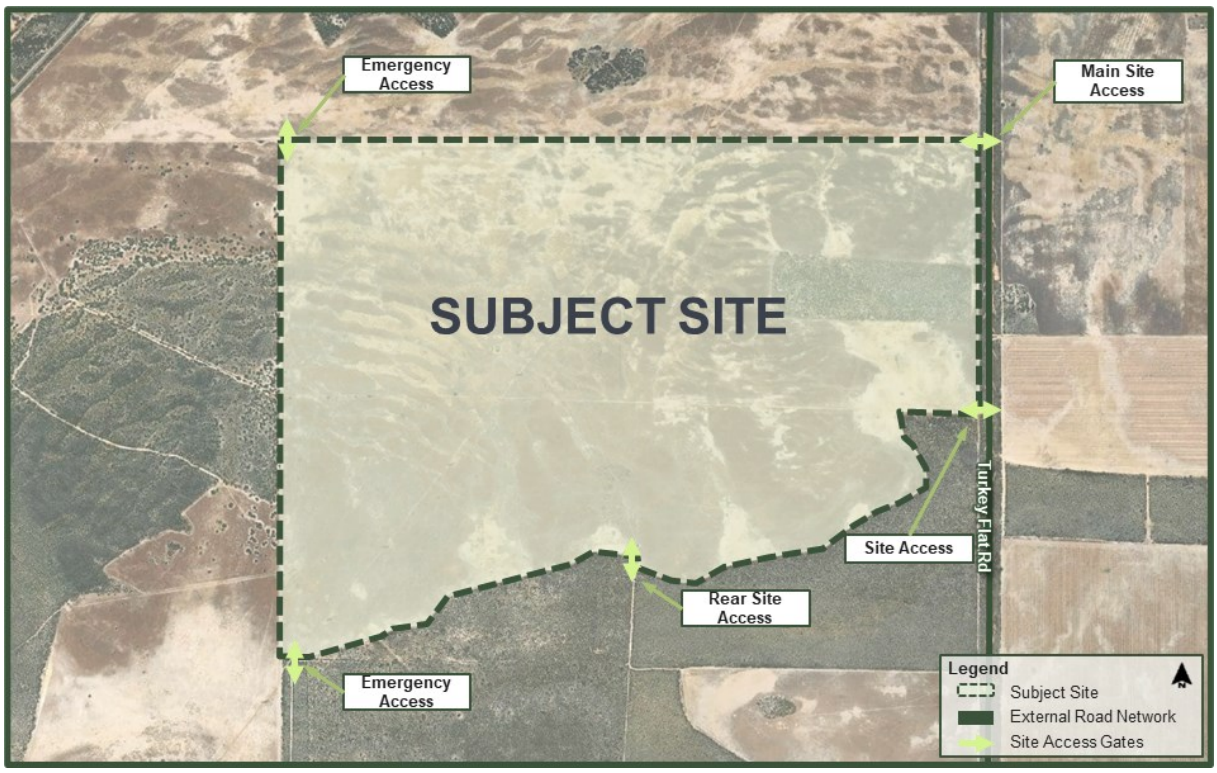
On their return trips, vehicles will use the same Eneabba-Three Springs Road/ Turkey Flat Road and Eneabba-Three Springs Road/ Brand Highway intersections.

Brand Highway and Eneabba-Three Springs Road are approved for the movements of the proposed largest vehicle for construction activities, the 27.5m long B-Double design vehicle under the MRWA. It should also be noted that a class RAV 1 Oversize & Over Mass (OSOM) permit needs to be obtained for the proposed four transformers' transportation. It is anticipated that the design vehicle for the transformer transportation will have the following geometric features:

- Approx. 53m trailer.
- 5 prime movers in a 3-2 push-pull formation and the suspension beam trailer.
- Approx. total length of 108m, but prime movers can be decoupled at intersections.

In their return trips, light vehicles will perform a left turn or right turn onto Eneabba-Three Springs Road to travel to their respective accommodation arrangements.

Figure 3 Site Access Points



2.4 Construction Vehicle Route

2.4.1 Heavy Vehicle Route

The solar panels, other materials, and construction machinery will be transported to the site via Brand Highway from the Port of Geraldton.

There will be no OSOM vehicles required during the construction period other than the transportation of four transformers under escort (assessed in **Section 2.4.2**). The largest vehicle that will be utilised for the Project, other than the transformer and switch room transportation, will be limited to the standard 20m long articulated vehicles (AVs) and B-Double design vehicles that can be up to 27.5m in length. It is worth noting that B-Double vehicles are anticipated to be used for the transportation of BESS batteries only, which weigh approximately 35 tonnes. All other materials will be transported with 20m long AVs (or smaller vehicles). The construction fleet, as outlined in **Section 4.0**, may also comprise 20m long goose-neck low loaders and 20m long truck & dog combinations.

Figure 4 overleaf shows the most direct route from the Port of Geraldton to the site. Based on SLR's review of the MRWA Restricted Access Vehicles (RAV) map, it was identified that this route is approved for B-Double design vehicles. In summary, all materials can be transported to the site from the Port of Geraldton through the route identified in **Figure 4**.

Figure 4 Construction Vehicle Route

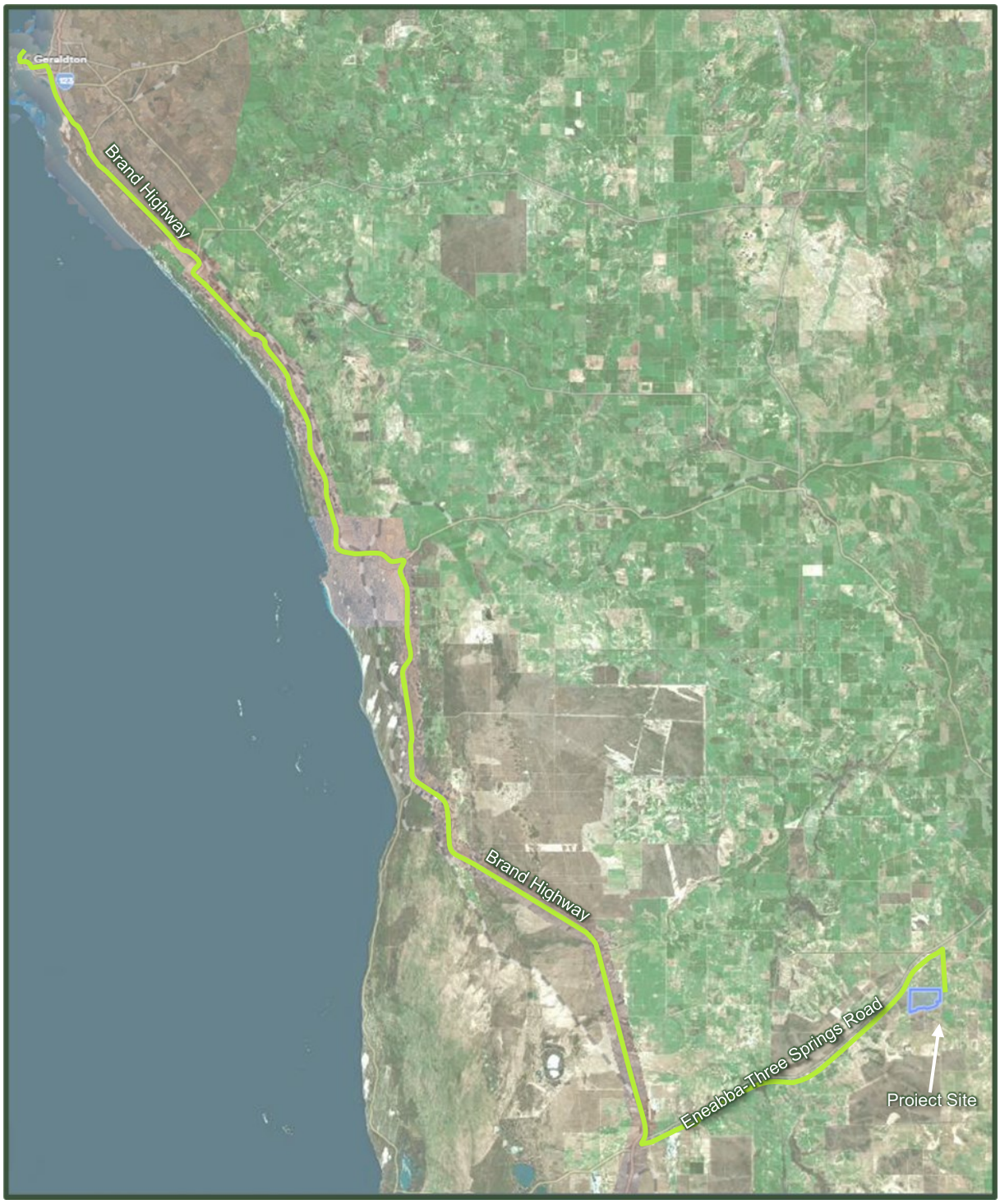


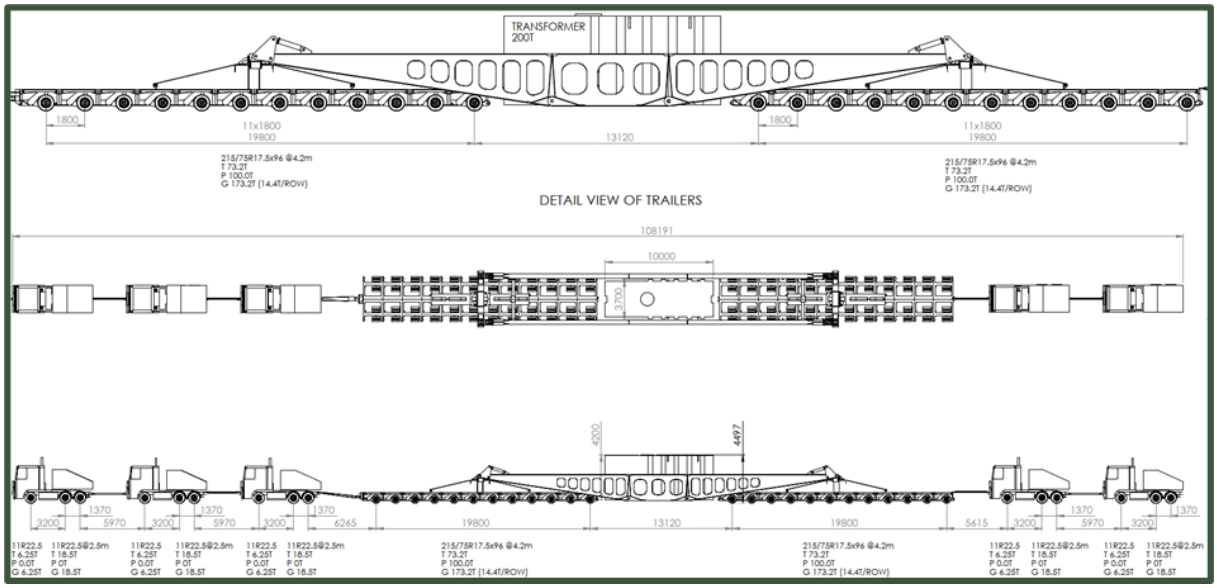
Figure 4 above shows the proposed route from the Port of Geraldton to the development site, which is the same for all construction vehicles as Brand Highway and the surrounding roads of the Port of Geraldton are approved for the standard 4.3m high heavy vehicles.

2.4.2 Transportation of the Transformer

Based on the discussions undertaken with the Applicant, it is understood that each of the four transformers required for the proposed solar farm and BESS facility will weigh approximately 220 tonnes. On this basis, SLR has identified that several prime movers will be required.

The geometric details of the anticipated design vehicle are shown in **Figure 5**.

Figure 5 Anticipated Equipment for Transformer Transportation



Source: Rex J Andrews (https://www.planningportal.nsw.gov.au/major-projects)

Based on SLR's prior project experience, it is anticipated that the entire transformer package (loaded on a beam set) would be 11m long x 4.5m wide x 4.5m long for the purposes of transportation. Given that the height of the transformer is beyond the typical 4.3m vertical clearances in the WA road network, SLR reviewed the MRWA's RAV mapping tool[12]. Through this review, SLR identified that the route from Port of Geraldton to the development site via Brand Highway is free of low overhead structures and, therefore, feasible.

On this basis, SLR has concluded that vertical clearances will not be an issue for the transformer transportation.

It is noted that the route will be verified again closer to the time of the transportation by a suitably qualified logistics contractor. This TIA has only considered the viability of the available routes to determine the feasibility of transformer transportation and the suitability of existing infrastructure.

2.4.3 Railway Corridors and Level Crossings

SLR studied the route using the MRWA open data source of railway crossings and identified no level crossings along the proposed haulage route. It is worth noting that there are two rail bridges along the proposed route, which should be assessed for the transportation of the transformers at a later stage.

[1] https://portal-mainroads.opendata.arcgis.com/pages/hvs-networks

[2] https://portal-mainroads.opendata.arcgis.com/search?tags=Oversize%2520Networks

2.5 Construction Phase

2.5.1 Activities

For the purposes of forecasting peak Project traffic demands associated with the construction stage, the following construction activities are anticipated to generate traffic on the external road network:

- Site clearance and establishment.
- Construction machinery deliveries.
- Equipment and material deliveries.
- Workforce transportation.

2.5.2 Workforce

It is anticipated that a maximum of 240 workers and 10 supervisors will travel to the site via buses and light vehicles at the peak of construction activities. This represents the highest volume of personnel potentially on-site at a given time. On a typical day, there will likely be fewer workers on site. However, for a conservative assessment, it has been assumed that there will consistently be 250 personnel accessing the site throughout the duration of the construction phase.

2.6 Operations Phase

2.6.1 Activities

Once the Project is operational, there will be no activities that require large numbers of workforce on site. It is understood that for the majority of the Project's life, operations will involve a range of preventative, corrective, and condition-based maintenance activities, which would entail various maintenance, inspection, and servicing for the solar farm and BESS facility, the associated electrical network, and internal road infrastructure.

The external movements associated with these tasks will generally be performed by 5.2m long VANs/ UTEs, 6.4m long small rigid vehicles (SRVs), and 8.8m long medium rigid vehicles (MRVs).

2.6.2 Workforce

Post-construction, it is anticipated that the maximum on-site workforce will be up to five workers.

2.7 Decommissioning Phase

At the end of the project's operational life, the applicant will be responsible for the decommissioning and rehabilitation of the solar farm. SLR has been informed that the decommissioning processes will have much less traffic generation than the construction period.

3.0 Existing Conditions Appraisal

3.1 Surrounding Road Network

The features of the road network surrounding the Project site are summarised in **Table 2**.

Table 2 Surrounding Road Network

Road Name	Road Owner	Width	Traffic/ Movement	Condition	Speed Limit (km/h)
Turkey Flat Rd	Local	6-7m	2-way, one lane in each direction.	Unsealed	Not sign-posted (110km/h - drive to conditions)
Eneabba-Three Springs Rd	Local	6-7m	2-way, one lane in each direction.	Sealed	Starts as 80km/h and changes to not sign-posted (110km/h - drive to conditions)
Carnamah-Eneabba Rd	Local	6-7m	2-way, one lane in each direction.	Sealed	Not sign-posted (110km/h - drive to conditions)
Brand Hwy	State	6-7m	2-way, one lane in each direction.	Sealed	110km/h

Access to the site is provided via Turkey Flat Road off Eneabba-Three Springs Road. Turkey Flat Road travels along the site's eastern boundary in the north-south direction and will service both access points of the development for the construction traffic. Turkey Flat Road is unsealed and varies from 6-7m in width. Current traffic flows on Turkey Flat Road are anticipated to be very low and associated with rural business operations.

The higher-order intersection that provides access to the site is the Brand Highway/ Eneabba-Three Springs Road intersection. This intersection readily has CHR and AUL(S) treatments, consistent with Austroads Guide to Road Design (AGRD) Part 4A. It is also noted that the eastern leg (Eneabba-Three Springs Road) at this intersection has a slip lane for the left-turn movements, which separates the left-turn and right-turn movements before the stop line.

The lower-order intersection that provides access to the site is the Eneabba-Three Springs Road/ Turkey Flat Road intersection. This intersection has Simple Right (SR) and Simple Left (SL) turn arrangements, consistent with the Queensland Department of Transport of Main Roads' supplement to AGRD Part 4A[3]. As discussed in **Section 2.3** earlier this report, the applicant is committed to providing upgrades at the Eneabba-Three Springs Road/ Turkey Flat Road intersection. More information on this is provided later in this document.

On the basis of the above, the existing conditions of the Brand Highway intersection and the proposed upgrades at the Turkey Flat Road intersection are considered sufficient to enable safe heavy vehicle movements during the construction period.

3.1.1 Surrounding Public/ Active Transport Network

Due to the rural nature of the area, the Project will have limited access to public transport. Nearby Eneabba Drive bus stop (in Eneabba) is located approximately 39km from the Project site and is within a 24-minute drive. Nearby Three Springs bus stop is located approximately 24km to the east of the Project site and is within a 17-minute drive. Also, there is no active

[3] https://www.tmr.qld.gov.au/_/media/busind/techstdpubs/road-planning-and-design/road-planning-and-design-2nd-edition/rpdmsuppvol3part4a.pdf

transport network around the project site. The active transport users (cycling/ walking) are expected to share the carriageway with other road users.

3.2 Traffic Surveys

To ascertain the existing traffic demands of the road network surrounding the site, SLR commissioned Austraffic to undertake automated tube count (ATC) surveys from Wednesday, 30 October 2024, to Wednesday, 13 November 2024 (see **Appendix B**). To be specific, one ATC was installed on Brand Highway, 800m north of the Brand Highway/ Eneabba-Three Springs Road intersection (see **Figure 6**). Another ATC was installed on Eneabba-Three Springs Road, 500m west of the Eneabba-Three Springs Road/ Turkey Flat Road intersection (see **Figure 7**). The AM and PM peak hour periods for each survey location and direction of travel are provided in **Table 3**.

Figure 6 Brand Highway ATC Survey Location



Figure 7 Eneabba-Three Springs Road ATC Survey Location



Table 3 Automated Tube Count AM/ PM Peak Hour Periods

ATC ID	Peak Day	Peak Hour	Direction	Light Vehicles	Heavy Vehicles	Road Trains
ATC 1	8/11/2024	10am-11am	Northbound	68	23	4
			Southbound	136	39	16
ATC 1	8/11/2024	2pm-3pm	Northbound	94	27	8
			Southbound	87	37	2
ATC 2	30/10/2024	7am-8am	Eastbound	6	1	3
			Westbound	2	3	3
ATC 2	4/11/2024	12pm-1pm	Eastbound	3	1	4
			Westbound	1	1	2

ATC 1 Location: Brand Highway, 800m north of Eneabba-Three Springs Road.
ATC 2 Location: Eneabba-Three Springs Road, 500m west of Turkey Flat Road.

3.3 Crash History in the Vicinity of the Project Site

SLR reviewed MRWA crash information on the open data portal for the most recent five-year period[4]. The study area was defined as the segment of Eneabba-Three Springs Road from Brand Highway to Turkey Flat Road and Brand Highway/ Eneabba-Three Springs Road intersection. No reported crashes were identified on Eneabba-Three Springs Road, and

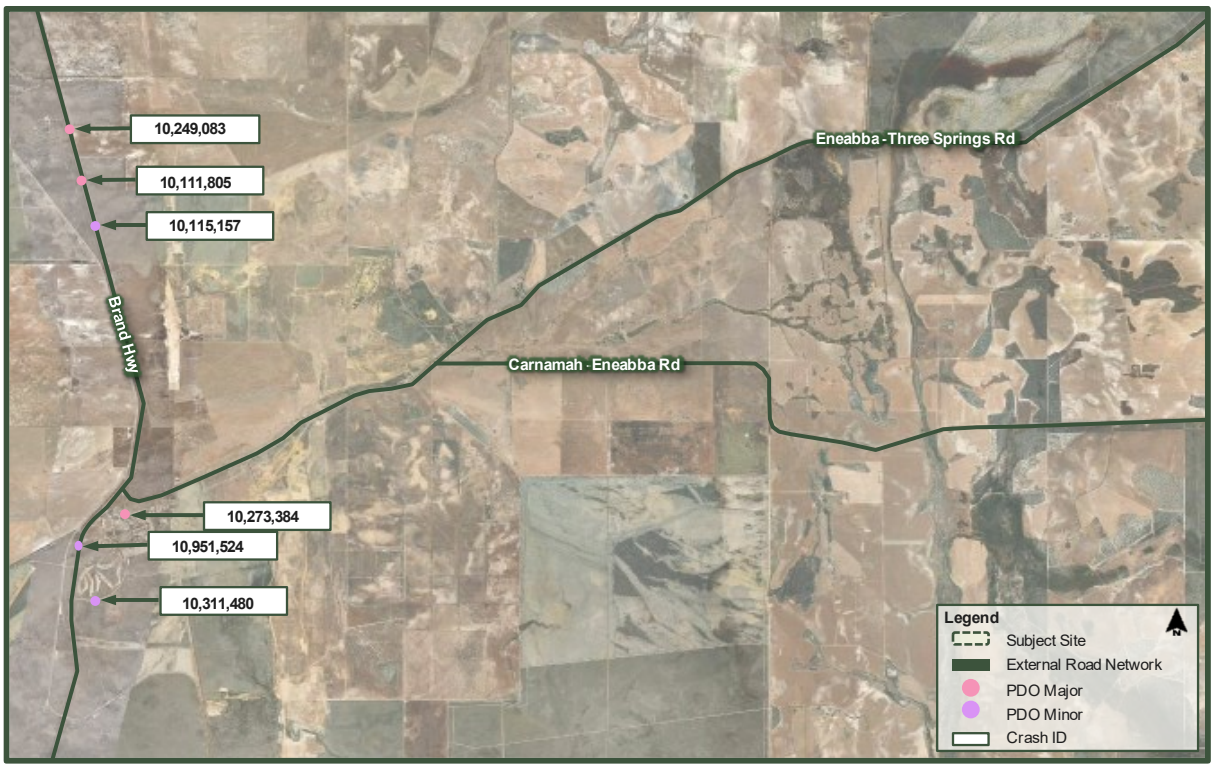
[4] MRWA crash information

therefore, only the crash results from the Brand Highway/ Eneabba-Three Springs Road intersection are documented in **Table 4** and **Figure 8**.

Table 4 Crash History & Locations (2019 – 2023)

Accident ID	Time	Location	Severity	Nature	Type	N# Truck5	N# Heavy Trucks6
10,249,083	06/2020	Brand Hwy	PDO Major	null	null	0	1
10,111,805	10/2019	Brand Hwy	PDO Major	Rear End	null	0	0
10,155,157	11/2019	Brand Hwy	PDO Minor	Non-Collision	Involving Animal	0	0
10,951,524	07/2023	Brand Hwy	PDO Minor	Head On	null	0	1
10,273,384	07/2020	Dewar St	PDO Major	Hit Object	null	0	0
10,311,480	10/2020	Eneabba Dr	PDO Minor	Non-Collision	null	0	0

Figure 8 Crash Locations



[5] MRWA defines Truck as an accident involving a truck or prime mover.

[6] MRWA defines Heavy Truck as an accident involving a truck & 1 trailer or prime mover & 1 trailer or road train. MRWA Crash Information (Last 5 Years)

The study revealed six crashes around the Brand Highway/ Eneabba-Three Springs Road intersection, with the crash severities evenly split between PDO major and PDO minor. It is worth noting that the reported crashes were reasonably far from the intersection, suggesting that the intersection itself is not problematic.

Based on the desktop evaluation of the crash record, there appears to be no singular or recurring road safety issue that would preclude the development or be materially exacerbated by the development.

3.4 Cumulative Traffic Impacts

In order to determine the location and nature of any planned upgrades of the surrounding road network, SLR reviewed the publicly available material[7], particularly MRWA's current projects website. The review indicated no major transport infrastructure upgrades are planned by MRWA and/ or Council in the surroundings of the study area.

A review of the publicly available information also identified that no other proposed large-scale projects would commence construction or operation in the surroundings of the Project site, which could result in exponential traffic growth in the vicinity.

[7] https://www.mainroads.wa.gov.au/projects-initiatives/all-projects/

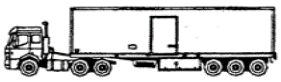
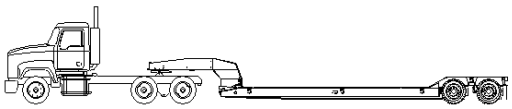
4.0 Project Traffic Demands

4.1 Traffic Generation

4.1.1 Construction Phase Traffic Assumptions

The vehicle fleet anticipated to be associated with the construction of the Project is shown in **Table 5** below.

Table 5 Project Construction Vehicle Fleet

Vehicle	Typical Vehicle Profile	Haulage Material
Private Vehicle (B99 design vehicle)		Supervision Workforce Assumed occupancy of 1 person per vehicle
Toyota Coaster Bus (22-seater)		Labour Workforce Assumed occupancy of 19 persons per vehicle
Concrete Truck (7.4 cubic meters)		Concrete
Heavy Rigid Vehicle (12.5m long HRV)		Waste removal
32t truck and dog (17m long)		Aggregates Quarry Products
Six Axle Articulated (20m long AV)		40ft Container (one full-size)
Goose-neck low loader (20m long)		Excavator Bulldozer Grader Compactor Piling Rig
B-Double (20m or 27.5m long)		27.5m long: 40ft and 20ft Containers (one full-size and one half-size) 20m long: energy storage batteries Construction mobilisation and demobilisation
OSOM		One-off transportation of the transformer

Traffic generated during the construction of the Project will primarily be associated with the transportation of materials/ equipment and the workforce. In order to simplify the construction traffic calculations, SLR has broken down the traffic-generating elements of the proposed works into two classes as follows:

- Construction heavy vehicle traffic.
- Construction workforce.

For ease of calculation and review, SLR has further broken down the construction heavy vehicle traffic into two stages: “site clearance and establishment” and “construction materials”.

The anticipated vehicle movements for both activities are detailed in **Table 6** and **Table 7**.

Table 6 Site Clearance and Establishment

Element	Assumption	Delivery Method	Anticipated Trips	Source
Site Clearing & Earthworks	3 x Bulldozer, 3 x Grader, 3 x Excavator, 3 x Mulcher, 3x Compactor	Low Loader	15 inbound and 15 outbound trips.	SLR assumption based on previous similar projects.
Water for Dust Suppression	3 x Water Truck	HRV (Water Truck)	0 inbound and 0 outbound trips.	SLR assumed that water would be sourced from the approved underground supplies.
Access Track Road Base	26,034m x 6m x 0.1m =15,620.4m^3 29,678.76t @1.9t per m^3 Compacted Base	17m Truck & Dog Combination (32t)	928 inbound and 928 outbound trips.	As provided by Trina Solar.
Road Base for Turkey Flat Road[8]	4,700m x 7m x 0.3m =9,870m^3 18,753t @1.9t per m^3 Compacted Base[9]	17m Truck & Dog Combination (32t)	587 inbound and 587 outbound trips.	SLR assumption.
Site Compound Aggregate Base	180m x 120m x 0.2m =4,320m^3 8,208t @1.9t per m^3 Compacted Road Base	17m Truck & Dog Combination (32t)	257 inbound and 257 outbound trips.	SLR assumption based on previous similar projects.
Substation and Switch Room Aggregate Base	115,000m^2 x 0.2m =23,000m^3 43,700t @1.9t per m^3 Compacted Road Base	17m Truck & Dog Combination (32t)	1,366 inbound and 1,366 outbound trips.	Area provided by Trina Solar. SLR assumed the whole area will be a hard stand.
BESS Aggregate Base	67,000m^2 x 0.2m =13,400m3 25,460t @1.9t per m^3 Compacted Road Base	17m Truck & Dog Combination (32t)	796 inbound and 796 outbound trips.	Area provided by Trina Solar. SLR assumed the whole area will be a hard stand.
Site Offices	12 Demountable Buildings	20m AV / Low Loader	12 inbound and 12 outbound trips.	SLR assumption based on previous similar projects.

[8] It is proposed that a portion of Turkey Flat Road near the Eneabba-Three Springs Road intersection be sealed to prevent gravel migration from Turkey Flat Road to Eneabba-Three Springs Road. Materials required to seal this segment are considered in SLR’s calculations.

[9] Calculation based on the assumption 0.2m of compacted road base and 0.1m of wearing coarse was used.

Element	Assumption	Delivery Method	Anticipated Trips	Source
Fencing	13,210m of Fencing Material	20m AV	27 inbound and 27 outbound trips.	SLR assumption based on the approximate boundary of the site (500m per truck).
TOTAL Trips (Site Clearance & Establishment			**3,988 inbound and 3,988 outbound trips.**	

Table 7 Construction Materials

Element	Assumption	Delivery Method	Anticipated Trips	Source
Minor Earthworks	10 Piling Rigs 10 Trenchers	Low Loader	20 inbound and 20 outbound trips.	SLR assumption based on previous similar projects.
Concrete Batching Plant Consumables	N/A	20m AV	50 inbound and 50 outbound trips.	SLR assumed that a concrete batch plant would be established. Internal transportation of concrete wouldn't count towards external traffic.
710W Panels Total 400MW	563,381 total panels	20m AV with 40ft Container	949 inbound and 949 outbound trips.	SLR assumption. (33 panels per pallet & 18 pallets per container.
Piles (Upright)	58,597 x 5.1m sections	20m AV with 40ft Container	118 inbound and 118 outbound trips.	SLR assumption of 7 piles per 1 tracker.1 SLR assumed 500 piles per truck.
Trackers (Horizontal)	8,371 x 36.5m sections	20m AV with 40ft Container	299 inbound and 299 outbound trips.	As provided by Trina Solar. SLR assumed 28 trackers per truck. (7,718 units of 84 module trackers, plus 653 units of 56 module trackers)
Fuel		17m Fuel Tanker	100 inbound and 100 outbound trips.	SLR assumption based on previous similar projects.
AC Reticulation	200,000m in 500m rolls. Up to 20 per container*	20m AV with 40ft Container	20 inbound and 20 outbound trips.	SLR assumption based on up to 10,000m for 20MW solar farm scaled up. SLR assumed 500m rolls and 20 rolls per container.
DC Reticulation	1,200,000m in 500m rolls. Up to 20 per container*	20m AV with 40ft Container	120 inbound and 120 outbound trips.	SLR assumption based upon 3,000m per MW. SLR assumed 500m rolls and 20 rolls in one container.
330kv Transmission wire	100m of wire.	20m Low Loader or OSOM	1 inbound and 1 outbound trip.	Provided by Trina Solar. SLR assumed 500m of cable per drum.
Solar Inverter		AV (20m long) or B-Double	114 inbound and 114 outbound trips.	As provided by Trina Solar.

Element	Assumption	Delivery Method	Anticipated Trips	Source
		(20m or 27.5m long)		
BESS Containers	4.07 MWh per BESS Container	AV (20m long) or B-Double (20m or 27.5m long)	504 inbound and 504 outbound trips.	As provided by Trina Solar.
Ancillary Equipment (Switch room)	Four trips per 100MW	Low Loader (20m)	6 inbound and 6 outbound trips.	SLR assumption based on previous similar projects.
BESS Inverter	1 x inverted per 4 x BESS Containers	AV (20m long) or B-Double (20m or 27.5m long)	126 inbound and 126 outbound trips.	As provided by Trina Solar.
Transformer	220t transformer	OSOM	4 inbound and 4 outbound trips.	SLR Assumption based on similar 330kV projects.
TOTAL Trips for Construction Materials			**2,431 inbound and 2,431 outbound. trips.**	

Table 8 provides an overview of the workforce assumptions.

Table 8 Construction Workforce Assumptions

Element	Assumption	Source	Anticipated Trips	Note
Travel Arrangements	Labour via 22-seater coaster bus.	SLR Assumption		Supervisors via private vehicle.
Workforce	250 persons maximum on-site. 18 passengers per bus, excluding the driver.	SLR Assumption	28 x 22-seater coaster bus trips and 20 light vehicle trips a day. Total: 24 inbound trips and 24 outbound trips a day.	SLR assumption based on previous similar projects. Assumed 240 workers and 10 supervisors. Assumed staff will not travel to accommodation for lunch. It is also assumed that buses will stay on site all day and supervisors will drive independently.
Roster	Six days on / one day off	SLR Assumption		
Shift rotation	Up to 12 hours of daylight	Sample Assumption		(11 hours average)
Construction Duration	assumed 12 months in the traffic assessment for conservatism. Minimum 312 Days	SLR Assumption		Based on working days plus Saturdays for the assumed 12-month construction duration.
Construction Deliveries	Spaced (linearly) across 12 months.	SLR Assumption		SLR assumption based on previous similar projects.
Light vehicle occupancy	No passengers per vehicle	SLR Assumption	10 inbound and 10 outbounds per day	
22-seater Coaster bus occupancy	18 passengers per vehicle	SLR Assumption	14 inbound and 14 outbound per day.	
Accommodation		SLR Assumption		
Workforce Distribution	70% from the East and 30% from the West. West distribution is broken down into 15% from the north and 15% from the south of Brand Hwy.	SLR Assumption		Three Springs, Carnamah, Mingenew (East) Brand Hwy (West)
Haulage Distribution	100% from the North	SLR Assumption		As provided by Trina Solar.
TOTAL Trips for Construction Workforce			**7,488 inbound and 7,488 outbound trips.**	

As summarised in **Table 6**, **Table 7** and **Table 8** above, it is anticipated that 13,907 inbound and 13,907 outbound trips will take place during the construction of the Project across the assumed 12-month period (312 working days = 260 business days plus Saturdays). To summarise, if the construction traffic were to occur on a linear basis, the following daily vehicle composition should be anticipated:

- **Light Vehicles:** 10 inbound trips and 10 outbound trips per day.
- **Heavy Vehicles (22-seater Toyota Coaster buses):** 14 inbound trips and 14 outbound trips per day.
- **Heavy Vehicles (all other materials & machinery):** 20-21 inbound trips and 20-21 outbound trips per day.

Based on this, it is anticipated that the typical traffic generation potential of the Project will be approximately 44-45 inbound and 44-45 outbound trips per day (A total of 90 trips per day).

SLR engaged in discussions with the Applicant to identify a peak period for heavy vehicle traffic. It was understood that the peak heavy vehicle traffic generation is anticipated to last 3-4 months. SLR anticipates that the peak heavy vehicle traffic will follow the average traffic generation during this period. As a result, the peak construction traffic is anticipated to be in the order of 90 vehicles per day (10 light vehicle return trips, 14 bus return trips, and 21 heavy vehicle return trips).

For additional conservativeness in the traffic analysis, SLR adopted the following assumptions:

- This TIA distributes construction traffic numbers over 12 months rather than the anticipated 15-18 months.
- The peak hour estimate was established by assuming that a third of the construction materials and site clearance vehicles would arrive at the site during the AM and PM peak hour periods, while the remaining third would arrive at the site outside the peak hour periods.
- The peak hour estimate was also established by assuming all construction workforce would arrive at the site during the AM peak hour and depart the site during the PM peak hour.

On the basis of the above, SLR has concluded that the anticipated peak hour traffic generation will be in the order of 24 single trips for the workforce and 7 single trips for the materials/ equipment, totalling at 31 single trips for each of the AM and PM peak hour periods.

4.1.2 Construction Workforce Accommodation

The Applicant has undertaken initial investigations for the accommodation of the construction workforce. It is anticipated that a maximum of 250 personnel will be required for the peak of construction activities however the applicant is committed to maximise the employment of local contractors. As a result, it is anticipated that a significantly smaller number of beds will be required from the nearby hotels at any given time.

A detailed accommodation plan will be prepared as part of the future and post-approval construction traffic management plan (CTMP); however, at this stage, hotels and motels in the following towns are considered:

- Three Springs, Carnamah and Mingenew (East).
- Those along Brand Highway (North and South).

Based on the initial research undertaken by the Applicant, the following accommodations will likely be the focus of accommodation options:

- The Commercial Hotel in Three Springs.
- Three Springs Motel in Three Springs.
- Commercial Hotel in Mingenew.
- Carnamah Hotel Motel in Carnamah.
- Carnamah Caravan Park in Carnamah.
- Various caravan parks along Brand Highway.

4.1.3 Operational Phase Traffic Generation

Solar farms and BESS facilities typically comprise limited equipment that requires regular maintenance. Therefore, the operational traffic demands associated with the Project are expected to be minimal and limited to minor servicing activities. Based on this, the operational traffic of the Project is not considered a critical element within this traffic assessment.

Nonetheless, the operational workforce assumptions were provided by the applicant and are summarised below in **Table 9** for completeness of this report.

Table 9 Operational Workforce

Element	Assumption	Source
Workforce	5 persons maximum on-site	SLR assumption
Roster	6 days on & 1 day off	SLR assumption
Permanent Workforce	None	SLR assumption
Contractor Workforce	10 persons (conservative maximum)	SLR assumption
Anticipated Fleet	Light vehicles, Disposal trucks (Small and Medium Rigid Vehicles)	SLR Assumption
Distribution	100% to/ from Goulburn (North)	SLR Assumption

4.1.4 Decommissioning Phase Traffic Generation

The site is proposed to be decommissioned, and the infrastructure will be removed following the end of the project's life. Works will be undertaken to return the site as close as possible to its original state and use. Detailed consideration of potential traffic demands associated with the decommissioning of the Project has not occurred, as such activity is anticipated to occur after the typically adopted design horizon for assessing traffic impacts. Nevertheless, the traffic demands associated with decommissioning are predicted to be less than those associated with construction activity, and hence, the sizing of infrastructure to accommodate construction traffic demands is expected to provide sufficient capacity to accommodate decommissioning traffic demands.

4.2 Traffic Volume

The peak hour Project traffic volumes were calculated using the traffic volumes outlined in **Section 3.2** and **Section 4.1** in this report. The construction traffic generation was considered in terms of light and heavy vehicle movements. The construction traffic generation was assumed to progress linearly over the assumed 12-month construction period, with almost 100% of materials expected to arrive from the west along Eneabba-Three Springs Road departing from the north (Port of Geraldton), noting that some materials may depart from the

south (Port of Fremantle). With this assumption, daily construction traffic generation was determined by adopting a 6-day work week.

For a conservative assessment, a peak hour estimate was established by assuming that all construction vehicles were to arrive at the site within a “one-hour period” instead of spreading out equally across the day (8-hours).

The traffic generated by the workforce was determined by considering a maximum of 250 workers on site, with 240 workers travelling to/ from the site in 22-seater Toyota Coaster buses (18 workers per bus) and the remaining ten supervisors all travelling privately in light vehicles. It is also assumed that 70% of the staff will be accommodated in the east (Three Springs, Carnamah, Mingenew) and the 30% located in the west, which is also split as 15% will be accommodated in the north (North of Brand Highway) and 15% in the south (South of Brand Highway) and therefore travel from/ to the Project site.

The background traffic was determined by conducting ATC surveys along Brand Highway and Eneabba-Three Springs Road. The peak hour traffic was determined from these surveys, as discussed in **Section 3.2** earlier in this report. The peak hour movements generated by the construction traffic, the anticipated workforce, and the determined background traffic were collated and summed up in desktop models, which are provided in **Appendix C**.

4.2.1 Appropriateness of the Increased Traffic Volumes

Based on the anticipated traffic generation potential of the Project (86-88 trips a day) and the existing average daily volumes in Eneabba-Three Springs Road (104 trips a day), it is anticipated that the traffic volumes in Eneabba-Three Springs Road during the construction of the Project will increase by approx. 84% to 192 vehicles per day.

Similarly, based on the anticipated traffic generation potential of the Project (86-88 trips a day), it is anticipated that the traffic volumes will be in the order of 100 trips a day along Turkey Flat Road, assuming that the existing volumes on Turkey Flat Road are no more than 12 trips a day.

Based on a review of Table 4.5: Single Carriageway Rural Road Widths of AGRD Part 3: Geometric Design, the anticipated traffic volumes in the construction scenario are consistent with the existing geometric details for both the Eneabba-Three Springs Road and Turkey Flat Road.

5.0 Traffic Engineering Considerations

5.1 Sight Distance Assessment

A sight distance assessment was undertaken for the site access locations and junctions along the light and heavy vehicle routes in accordance with the following:

- Part 4A: Unsignalised and Signalised Intersection of the Austroads Guide to Road Design.
- Part 3: Guide to Road Design: Geometric Design of the Austroads Guide to Road Design.

Safe Intersection Sight Distance (SISD) is the minimum sight distance that should be provided on the major road at any intersection, providing sufficient distance for a driver of a vehicle on the major road to observe a vehicle on the minor road moving into a collision situation (e.g., in the worst case, stalling across the traffic lanes), and to decelerate to a stop before reaching the collision point.

The required SISD was calculated for the Brand Highway/ Eneabba-Three Springs Road intersection and the Eneabba-Three Springs Road/ Turkey Flat Road intersection per the *Austroads Guide to Road Design, Part 4A, Section 3.2.2*.

The formula applied is illustrated in **Equation 1**.

Equation 1 SISD Formula

$$SISD = \frac{D_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$

where

SISD	=	safe intersection sight distance (m)
D_T	=	decision time (sec) = observation time (3 sec) + reaction time (sec) – refer to *AGRD Part 3* (Austroads 2016b) for a guide to values
V	=	operating (85th percentile) speed (km/h)
d	=	coefficient of deceleration – refer to Table 3.3 and *AGRD Part 3* for a guide to values
a	=	longitudinal grade in % (in direction of travel: positive for uphill grade, negative for downhill grade)

5.1.1 SISD Calculations

The SISD calculation, as per *Table 3.2 in Austroads Guide to Road Design Part 4A,* requires 341m for a design speed of 120 km/h (posted speed limit + 10 km/h), using a 2.5-second reaction time and 341m for a design speed of 120 km/h (posted speed limit + 10 km/h), using a 2.5-second reaction time. For Eneabba-Three Springs Road, the speed limit starts as a posted speed limit of 80km/h but increases to an unposted speed limit (default 110km/h).

5.1.2 SISD Results

Figure 9 and **Figure 10** overleaf illustrate that both intersections have sufficient sight distances with no obstructions caused by bends, crests and/or vegetation.

Figure 9 SISD at Brand Highway/ Eneabba-Three Springs Road Intersection



Figure 10 SISD at Eneabba-Three Springs Road/ Turkey Flat Road Intersection



Dashboard camera images and photos captured on 17/10/2024 and SLR's desktop analysis through the high-resolution NearMap aerial imagery review concluded that the SISD at each intersection meets the Austroads Guidelines.

Figure 11 Existing Road Condition Eneabba-Three Springs Road



Figure 12 Existing Road Condition Eneabba-Three Springs Road



Dashboard camera images and photos captured during SLR's site inspection on 17/10/2024 demonstrate that the existing vegetation is set back from the road edge, so it doesn't adversely impact the SISD. During the site inspection, it was also identified that the edges of Eneabba-Three Springs Road are rough and deteriorating in sections. This issue has been captured in the Drivers' Code of Conduct (more on this later).

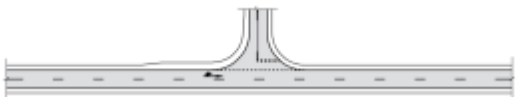
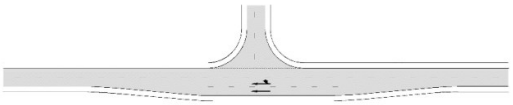
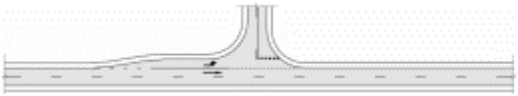
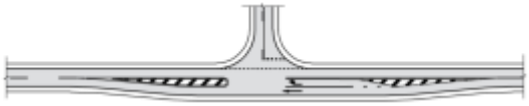
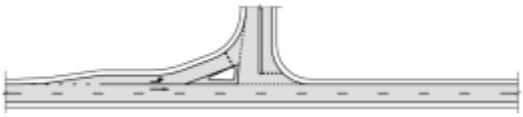
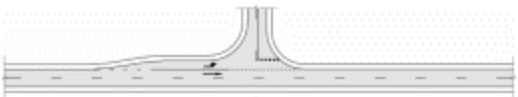
5.2 Turn Lane Warrant Assessment

Turn lane warrant assessments were undertaken for each of the existing intersections in accordance with the following:

- Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management (AGTM-6-20).
- MRWA Supplement AGTM-6-20 (AGTM-6 Supplement).

The warrants provide guidance on where turning lanes should be provided based on the design traffic volumes. **Table 10** below provides a pictorial description of the various turn treatments considered.

Table 10 Turn Treatment Types

Acronym	Right Turn Treatment	Left Turn Treatment
BAR or BAL	 BAR (Basic Right Turn)	 BAL (Basic Left Turn)
AUR or AUL(S)	 AUR (Auxiliary Right Turn)	 AUL(S) (Auxiliary Left Turn (Short))
CHR or AUL or CHL	 CHR (Channelised Right Turn)	 CHL (Channelised Left Turn)  AUL (Auxiliary Left Turn)

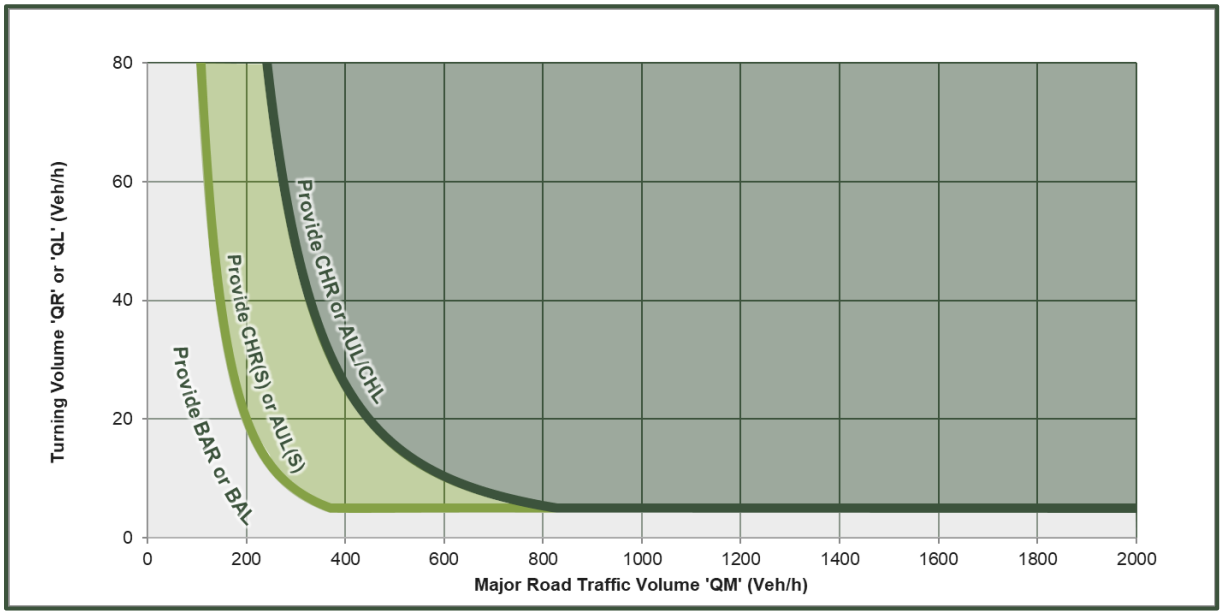
Source: Austroads Guide to Traffic Management Part 6 (Austroads).

The warrants were produced by establishing the conflicting traffic volumes at which the benefits of providing a higher level of treatment (i.e., the reduction in estimated crash costs) are equal to the additional construction costs associated with providing the higher treatment. The benefits and costs of a higher-level treatment were compared to the base case (minimum turn treatments).

AGTM-6 Supplement notes that MRWA's supplementary method incorporates the high percentage of heavy vehicles and road trains on WA roads.

The turn warrants for a greenfield site with a design speed of greater than 100 km/h (with 7.725% heavy vehicles and 0% road trains) are shown in **Figure 13** overleaf.

Figure 13 Turn Warrant Assessments (Major Road Design Speed ≥ 100km/h)



5.3 Intersection Turning Treatments

Turn warrant assessments have been undertaken for the construction peak periods for the following intersections:

- Brand Highway/ Eneabba-Three Springs Road.
- Eneabba-Three Springs Road/ Turkey Flat Road.
- Turkey Flat Road/ Site Access Gate 1.
- Turkey Flat Road/ Site Access Gate 2.

SLR conducted the assessment assuming 33.33% of daily construction vehicles and 100% of daily workforce vehicles would access the site in the AM and PM peak hour periods for a highly conservative evaluation.

Table 11 overleaf provides a summary of the existing turn treatments and required turn treatments stipulated by the AGTM-6 Supplement, while detailed outputs of the MRWA-standard turn warrant assessments are provided in **Appendix D**.

Table 11 Summary of Turn Warrant Assessment Results

Intersection/ Scenario	AM			PM		
	RT Q_M	LT Q_M	Required Treatment	RT Q_M	LT Q_M	Required Treatment
Brand Highway/ Eneabba-Three Springs Road						
Construction	320	202	AUR/AUL	284	134	SR/BAL
Eneabba-Three Springs Road / Turkey Flat Road						
Construction	38	8	BAR/BAL	14	4	BAR/SL
Turkey Flat Road/ Site Access Gate 1						
Construction	30	15	BAR/SL	22	15	SR/SL
Turkey Flat Road/ Site Access Gate 2						
Construction	8	4	BAR/SL	8	4	SR/SL

* SR = Simple Right Turn, SL = Simple Left Turn

5.3.1 Turn Warrant Assessment Summary

Approach from the West

The turn warrant assessments indicate that Basic Right Turn (BAR) or Basic Left Turn (BAL) treatments will be sufficient at every intersection for vehicles traveling to the site, except the Brand Highway/ Eneabba-Three Springs Road intersection, which, during the construction period, would require an Auxiliary Right Turn (AUR) or Auxiliary Left Turn (AUL) treatments. Consistent with the MRWA Guidelines, this intersection readily has CHR and AUL treatments, indicating that the intersection is sufficient to accommodate the anticipated construction traffic.

However, Eneabba-Three Springs Road/ Turkey Flat Road has SR and SL arrangements. Based on the outcomes of the turn warrant assessments and the anticipated high number of heavy vehicles and road trains, it is recommended that this intersection be upgraded to BAR for the incoming heavy vehicle activities from the west.

Approach from the East

It should be noted that no heavy vehicles are anticipated to approach the Eneabba-Three Springs Road/Turkey Flat Road intersection from the east. Only a portion of the workforce will approach this intersection in Toyota Coaster type minibuses from the east. On this basis, upgrading the existing SL arrangement to BAL is considered sufficient.

Access Driveways

Consistent with **Table 11**, it is recommended that Turkey Flat Road be upgraded to have BAR arrangements near the two site access gates. No traffic is anticipated to approach the site from the south, and therefore, SL arrangements are considered sufficient at the access driveways.

Conclusions

In the interest of road safety, the Applicant has committed to upgrading the right-hand turn arrangement at the Eneabba-Three Springs Road/ Turkey Flat Road intersection to *"basic right turn (BAR)"* and left-hand turn treatment at the same intersection to *"basic left-turn treatment (BAL)"*.

5.4 Swept Path Assessments

As discussed in **Section 2.4.2** of this report, four approx. 220T transformers will be required as part of the project. All transformers are expected to be shipped to the Port of Geraldton from overseas manufacturers and transported on the road via Brand Highway under escort. It is also noted in this report that the largest non-OSOM vehicle will be the 27.5m long B-Double design vehicle. On this basis, SLR has undertaken swept path assessments at the following two intersections for the two nominated design vehicles, which are required to enable the construction activities:

- Brand Highway/ Eneabba-Three Springs Road.
- Eneabba-Three Springs Road/ Turkey Flat Road.

SLR has also undertaken a swept path assessment for the transformer movement at the potential access driveway location. All swept path assessments are provided in **Appendix E**.

6.0 Operational Assessment

6.1 Assessment Scenarios

For the purposes of the traffic assessment, it was assumed that the Project would be completed and fully occupied by 2027. Consistent with standard industry practice, the following traffic assessment scenarios have been adopted:

- **2024 'Survey:** To establish operational conditions and baseline results at the time of the traffic surveys.
- **2027 'Background':** To establish the year of opening baseline operating conditions in the absence of the Project at all intersections assessed.
- **2027 'With Construction':** To quantify the incremental impact of construction traffic conditions.

The operational performance of the Brand Highway/ Eneabba-Three Spring Road intersection and the Eneabba-Three Spring Road/ Turkey Flat Road intersection, along with the two site-access gates on Turkey Flat Road, have been analysed for each of these assessment scenarios during both the weekday AM and weekday PM peak hour periods.

Peak traffic demands are illustrated graphically in the desktop models, which are provided in Appendix C. It should also be noted that the weekend AM and PM peaks were not modelled, as weekday peak periods would have provided higher volumes and, therefore, a more representative model.

6.2 Performance Criteria

SIDRA Intersection 9.1 (SIDRA) is a computer-based modelling software that determines the operational performance of intersections based on input parameters, including carriageway geometry and traffic volumes. Amongst other parameters, SIDRA provides an estimate of the intersection's Degree of Saturation (DOS), queues, and delays.

According to widely adopted Transport for New South Wales (TfNSW) Modelling Guidelines (2013), the desirable maximum DOS thresholds are summarised in **Table 12** below.

Table 12 Intersection Performance Thresholds

Intersection Type	DOS Threshold
Priority Controlled	Less than or equal to 0.80

Similarly, MRWA Operational Modelling Guidelines (2021) recommends that Level of Service (LoS) D should be targeted in intersection performance analysis.

Intersection analysis results exceeding those presented in **Table 12** or LoS D indicate that an intersection is operating above its practical capacity, and upgrade works may be warranted. Above these threshold values, users of the intersection are likely to experience rapidly increasing delays and queuing.

MRWA defines intersection performance based on vehicle delay. SIDRA can calculate the average delay encountered by all vehicles that travel through individual lanes and approaches at the intersection level. The level of service can then be determined based on the reported delay. It should also be noted that for roundabouts and priority control intersections, the critical movement for the level of service assessment should be that with the worst movement delay.

In addition to the DOS metrics, delay should also be considered when assessing the performance of an intersection. TfNSW recommends using the critical movement delay to

determine the performance of priority-controlled intersections. It is also worth noting that the widely adopted TfNSW Guide to Traffic Generating Developments states the average delay statistic for the critical movement provides a better indication of intersection performance and safety for roundabouts and priority-controlled intersections than DOS.

The operational assessment documented herein will be conducted considering the above performance criteria.

6.2.1 SIDRA Inputs

As recommended by MRWA Modelling Guidelines (2021), default input parameters were utilised to assess the intersections in the study below.

6.3 Existing Traffic Demand

In the absence of sufficient publicly available traffic volume data and to ascertain the existing traffic demands of the road network surrounding the site, SLR commissioned Austraffic to undertake ATC surveys in November 2024 outside the school holiday period.

As detailed in **Section 3.2** earlier in this report, peak periods were identified based on SLR's analysis of the ATC survey data.

6.4 Background Traffic Growth

In the absence of recent AADT data through MRWA's online sources, SLR adopted a conservative 2% per annum growth rate to identify the 2027 volumes derived from the 2024 survey data.

6.5 Intersection Assessment

6.5.1 Brand Highway/ Eneabba-Three Springs Road Intersection

The Brand Highway/ Eneabba-Three Springs Road intersection is currently configured as a three-way priority-controlled intersection, as shown in **Figure 14** overleaf. SIDRA analysis outputs for this intersection are summarised in **Table 13** overleaf and detailed outputs are included in **Appendix F**.

As part of the calibration of the existing queues in the SIDRA model, site observations were used to validate the resultant queues on all approaches.

Figure 14 Existing Intersection Form - Brand Hwy/ Eneabba-Three Springs Rd

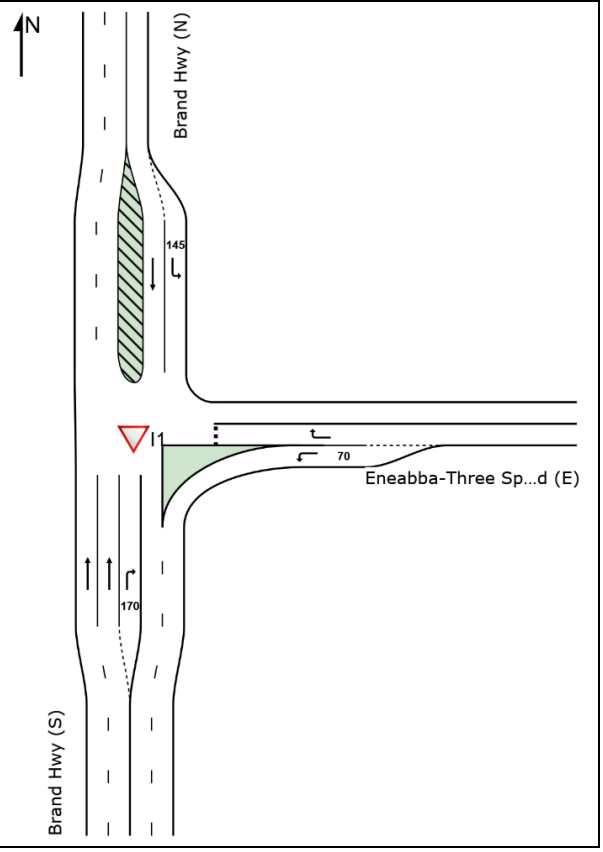
Nearmap Aerial	SIDRA Layout
	

Table 13 Summary of SIDRA Outputs - Brand Hwy/ Eneabba-Three Springs Rd

Scenario	AM Peak				PM Peak			
	DoS	Worst Delay (s)	95%th Queue (m)	LoS	DoS	Worst Delay (s)	95%th Queue (m)	LoS
2024 Existing	0.117	12.9* (East Approach – RT)	0.5	B	0.079	12.1* (East Approach – RT)	0.3	B
2027 Background	0.124	13.3* (East Approach – RT)	0.5	B	0.084	12.4* (East Approach – RT)	0.3	B
2027 Background & Construction	0.124	15.7* (East Approach – RT)	1.6	C	0.089	12.5* (East Approach – RT)	1.4	B

Table 13 indicates that the Brand Highway/ Eneabba-Three Springs Road intersection will perform at LoS C or better in all assessed scenarios. On this basis, no upgrades are proposed nor considered necessary at this intersection to enable the proposed project.

6.5.2 Eneabba-Three Springs Road/ Turkey Flat Road Intersection

The Eneabba-Three Springs Road/ Turkey Flat Road intersection is currently configured as a three-way priority-controlled intersection, as shown in **Figure 15** overleaf. SIDRA analysis outputs for this intersection are summarised in **Table 14** overleaf and detailed outputs are included in **Appendix F**.

Figure 15 Existing Intersection Form - Eneabba-Three Springs Rd/ Turkey Flat Rd

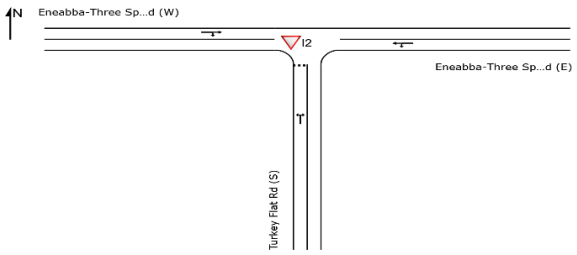
Nearmap Aerial	SIDRA Layout
	

Table 14 Summary of SIDRA Outputs - Eneabba-Three Springs Rd/ Turkey Flat Rd

Scenario	AM Peak				PM Peak			
	DoS	Worst Delay (s)	95%th Queue (m)	LoS	DoS	Worst Delay (s)	95%th Queue (m)	LoS
2024 Existing	0.009	9.7* (South Approach – LT)	0.1	A	0.007	9.7* (South Approach – LT)	0.1	A
2027 Background	0.009	9.7* (South Approach – LT)	0.1	A	0.007	9.7* (South Approach – LT)	0.1	A
2027 Background & Construction	0.022	10.9* (South Approach – LT)	0.5	B	0.035	10.5* (West Approach – RT)	0.7	B

Table 14 indicates that the Eneabba-Three Springs Road/ Turkey Flat Road intersection will perform at LoS B or better in all assessed scenarios. On this basis, no upgrades are proposed nor considered necessary at this intersection to enable the proposed project from a congestion and queuing perspective. However, as discussed in **Section 5.3** earlier in this report, it is proposed that this intersection be upgraded with BAL and BAR treatments to improve road safety.

6.5.3 Turkey Flat Road/ Site Access 1 (Driveway)

The Turkey Flat Road/ Site Access 1 driveway is currently not constructed, but it will be configured as a three-way priority-controlled intersection, as shown in **Figure 16** overleaf. SIDRA analysis outputs for this intersection are summarised in **Table 15** overleaf and detailed outputs are included in **Appendix F**.

Figure 16 Existing Intersection Form - Turkey Flat Road/ Site Access 1

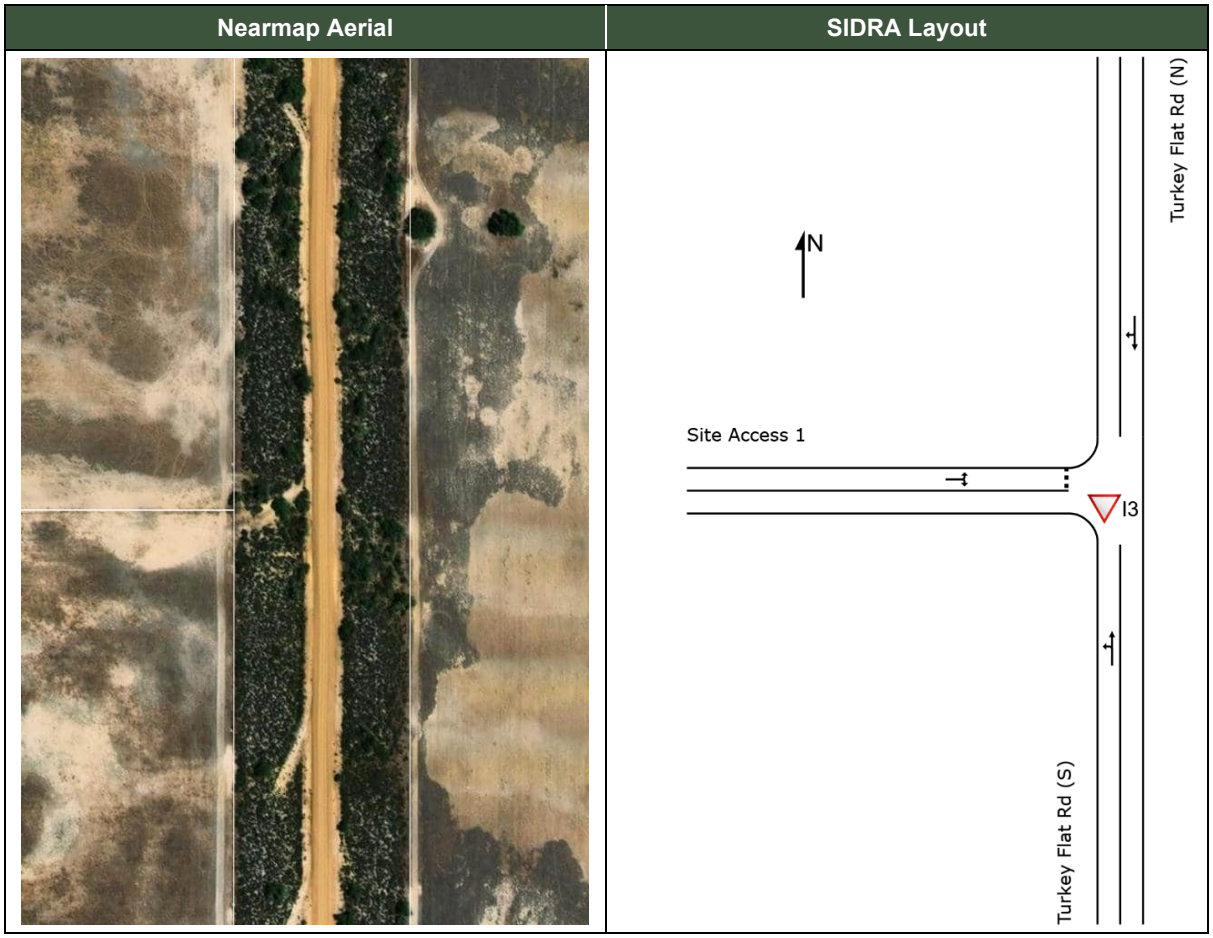


Table 15 Summary of SIDRA Outputs - Turkey Flat Road/ Site Access 1

Scenario	AM Peak				PM Peak			
	DoS	Worst Delay (s)	95%th Queue (m)	LoS	DoS	Worst Delay (s)	95%th Queue (m)	LoS
2027 Background & Construction	0.028	9.9* (North Approach – RT)	1.3	A	0.019	10.9* (North Approach – RT)	0.3	B

Table 15 indicates that once constructed, the Turkey Flat Road/ Site Access 1 driveway will perform at LoS B or better during the constriction period.

6.5.4 Turkey Flat Road/ Site Access 2 (Driveway)

The Turkey Flat Road/ Site Access 2 driveway is currently not constructed, but it will be configured as a three-way priority-controlled intersection, as shown in **Figure 17** below. SIDRA analysis outputs for this intersection are summarised in **Table 16** below and detailed outputs are included in **Appendix F**.

Figure 17 Turkey Flat Road/ Site Access 2 Intersection Form

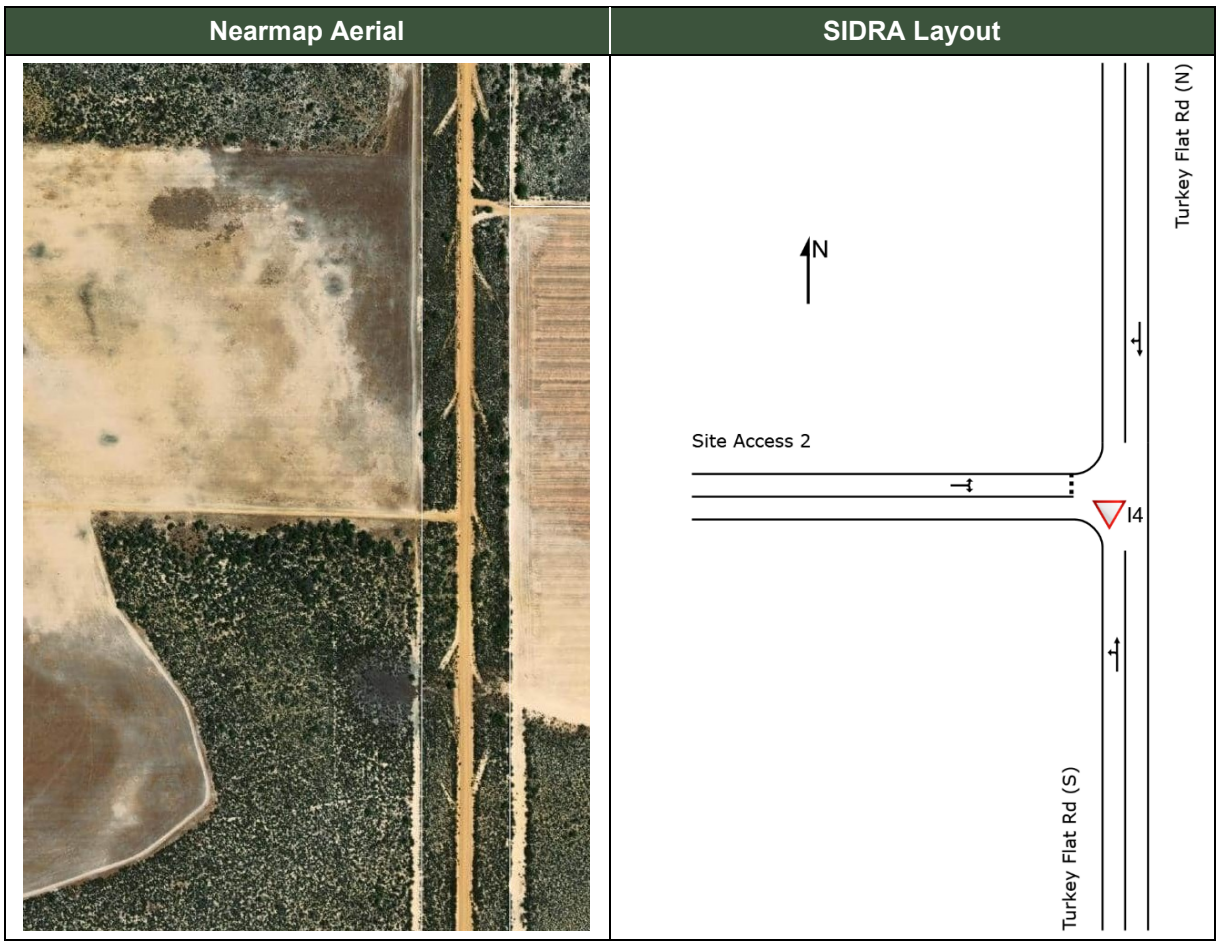


Table 16 Summary of SIDRA Outputs - Turkey Flat Road/ Site Access 2

Scenario	AM Peak				PM Peak			
	DoS	Worst Delay (s)	95%th Queue (m)	LoS	DoS	Worst Delay (s)	95%th Queue (m)	LoS
2027 Background & Construction	0.011	9.9* (North Approach – RT)	0.5	A	0.010	10.8* (North Approach – RT)	0.2	B

Table 16 indicates that once constructed, the Turkey Flat Road/ Site Access 1 driveway will perform at LoS B or better during the constriction period.

Based on the results documented in **Table 13** to **Table 16**, it is anticipated that all assessed intersections will operate within the acceptable thresholds during the construction period.

7.0 Construction Traffic Management Strategies

These preliminary comments have been prepared to provide strategic advice for the future construction traffic management plan (CTMP), which will only be prepared following the approval of the DA, and more information is available about the proposed construction strategy. This information includes workforce accommodation, the construction program, and the vehicle fleet that will be used, which will be subject to the availability of hotels, staging of the project, and availability of construction vehicles.

Notwithstanding, at a high level, it is recommended that the following be considered or prepared as part of the CTMP:

7.1 Drivers Code of Conduct

It is important to note that all drivers are responsible for following WA road rules and the Drivers' Code of Conduct. SLR has prepared a conceptual Drivers Code of Conduct, which is provided in **Appendix G**.

7.2 Traffic Guidance Schemes (TGSs)

It is important to note that the majority of works will be carried out within the property boundary of the acquired land other than the proposed BAL and BAR upgrade at the Eneabba-Three Springs Road/ Turkey Flat Road intersection and the addition of a small section of road on Turkey Flat Road near the intersection with Eneabba-Three Springs Road to minimise gravel migration from Turkey Flat Road to Eneabba-Three Springs Road.

It is anticipated that these works will be commissioned separately; therefore, construction activities for each of the following will occur at different times:

- Construction of BAR and BAL treatments at the Eneabba-Three Springs Road/ Turkey Flat Road intersection and sealing a short section on Turkey Flat Road to prevent gravel migration.
- Construction of the proposed solar farm, BESS and substation.

It is anticipated that each CTMP will have their own TGSs. In the absence of information on construction methodologies and programs, it is not possible for this TIA to discuss the respective traffic management strategies in detail.

Notwithstanding, the CTMP for the works listed above must be prepared to satisfy the STS.

7.3 Site Management

The following procedures are to be observed by all vehicle drivers accessing the subject sites:

- Drivers are to obey all site signage and the directions of the site personnel.
- All vehicles are to park and load/ unload within the site using the designated parking and loading areas where possible. Vehicles are not to park or load/ unload within the public road reserve.
- All drivers are required to operate vehicles in a safe and courteous manner, within and external to the subject site.

7.4 Heavy Vehicle Management

7.4.1 General Requirements

Heavy vehicles accessing the site must abide by their respective company operating procedures in addition to standard WA road rules when operating the vehicle.

The following rules must also be followed:

- The majority of the workforce must be transported with shuttle buses that are similar to Toyota Coaster and Toyota HiAce Commuter.
- Consistent with the OSOM material transportation requirements, pilot vehicles and escorts must be utilised for non-standard loads.
- Temporary signage must be positioned at critical intersections to inform construction vehicle drivers and to warn the general public about the construction activities in the vicinity.

It is also worth noting that there are no school zones or dense urban areas that construction vehicles will have to travel through. Also, obtaining approvals to access private property will not be required. The entirety of the proposed road upgrades will be undertaken in the local road reserves.

7.4.2 Noise Management

To limit heavy vehicle noise associated with construction activities, drivers are to abide by the following requirements:

- Posted speed limits on the external road network are to be observed.
- Vehicles are to be turned off when not in use.

7.4.3 Dust Management

The contractor should identify appropriate mitigation measures, and strategies should be listed in the CTMP for dust management.

7.5 Mitigation Measures

The impacts of construction traffic and the mitigating measures to be implemented are outlined in **Table 17**.

Table 17 Construction Traffic Mitigation Measures

Mitigation Measures	Responsibility	Timing
Construction Traffic on Turkey Flat Road: Construction traffic will use the new accesses to enter/ exit the site. To ensure the impacts to motorists within the area are kept to a minimum, construction traffic will remain low.	Site Manager	Daily
Management of deliveries: The site manager will manage deliveries to ensure that construction vehicle movements will remain low.	Site Manager	As Required
Safety during construction: The safety of motorists and the public throughout the area will be maintained during construction through the preparation and execution of TGSs. TGS plans will be implemented, managing the access and the general public's movement around construction activities. They should identify all reasonably foreseeable hazards, assess them, and manage them	Site Manager and Traffic Control Supervisor	Daily

Mitigation Measures	Responsibility	Timing
as best possible by eliminating or minimising the risks. The TGSs shall be monitored and updated accordingly throughout the project.		
Reporting: Reporting and monitoring of construction vehicle movements are to be undertaken to ensure that drivers are adhering to restricted times.	Site Manager	Weekly

7.6 Risk Assessment

A risk assessment is intended to identify hazards and risks associated with construction activities. The purpose is to determine the controls required for the protection of road workers and road users. A Risk Assessment associated with the construction works of this site should be prepared and provided in the CTMP.

7.7 TMP Monitoring/ Review & Improvement Process

7.7.1 Implementation

The proposed works should be carried out in accordance with the following requirements:

- The approved Issued for Construction drawings, Traffic Management Plan (TMP) and Traffic Guidance Schemes (TGS).
- All associated Federal and State statutory requirements, e.g., environment, cultural heritage, etc., as required.

7.7.2 Monitoring and Review

The approved CTMP should be monitored and reviewed regularly. If issues arise, the CTMP should be revised to mitigate the issues. Regarding the implemented TGS plans, these should be monitored and reviewed on a daily basis to ensure signs and devices are installed correctly and convey the correct and intended messages.

7.7.3 Work Site Inspections, Recording and Reporting

At the commencement of works, the TGS setup shall be inspected to confirm accuracy with the intended TGS, as well as to ensure locations of signage and devices are safe and do not cause hazards to traffic. This inspection shall be documented within a site register and repeated at the commencement of each week of the construction program.

7.7.3.1 Incident Management

For the purposes of this CTMP, an ‘incident’ is an occurrence or set of circumstances that causes or threatens to cause material harm, which may or may not cause non-compliance. Furthermore, ‘non-compliance’ is an occurrence, set of circumstances or development that breaches the consent.

In the event of an incident relating to traffic, the Contractor’s Site Manager must notify the Construction Project Manager immediately, following any need to alert emergency services. Such incidents may include, but not be limited to:

- Vehicle crash or injury resulting from construction traffic related to the project.
- Spill of any dangerous goods or hazardous substance to ground or water.

- Substantiated complaints from community members or regulatory authorities relating to traffic management.
- Land-based off-site sediment loss to the environment, including sediment tracking onto the roadway.

7.8 Contingency Plan

The Contractor shall establish a contingency plan per Trina Solar's requirements.

7.9 Communications Strategy

The Contractor shall establish a communications strategy per Trina Solar's requirements.

8.0 Recommendations

Based on SLR's analysis documented in this report, the following recommendations have been made:

8.1 Road Upgrades

Based on the turn warrant assessments undertaken for the Eneabba-Three Springs Road/ Turkey Flat Road intersection in **Section 5.2** earlier in this report, it was considered that upgrading this intersection is necessary based on the outcomes of the turn warrant assessments and the anticipated high number of heavy vehicles and road trains during the construction period. It is recommended that the Applicant upgrade this intersection with BAR and BAL turn treatments to improve road safety at this location. *Figure 7.1* and *Figure 8.2* in *Austroads Guide to Road Design (AGRD) Part 4A: Unsignalised and Signalised Intersections* provide an overview of the technical details for BAR and BAL turn treatments at unsignalised intersections. These figures are replicated in **Figure 18** and **Figure 19** below.

Figure 18 Basic Right Turn (BAR) Treatment on a Two-Lane Rural Road

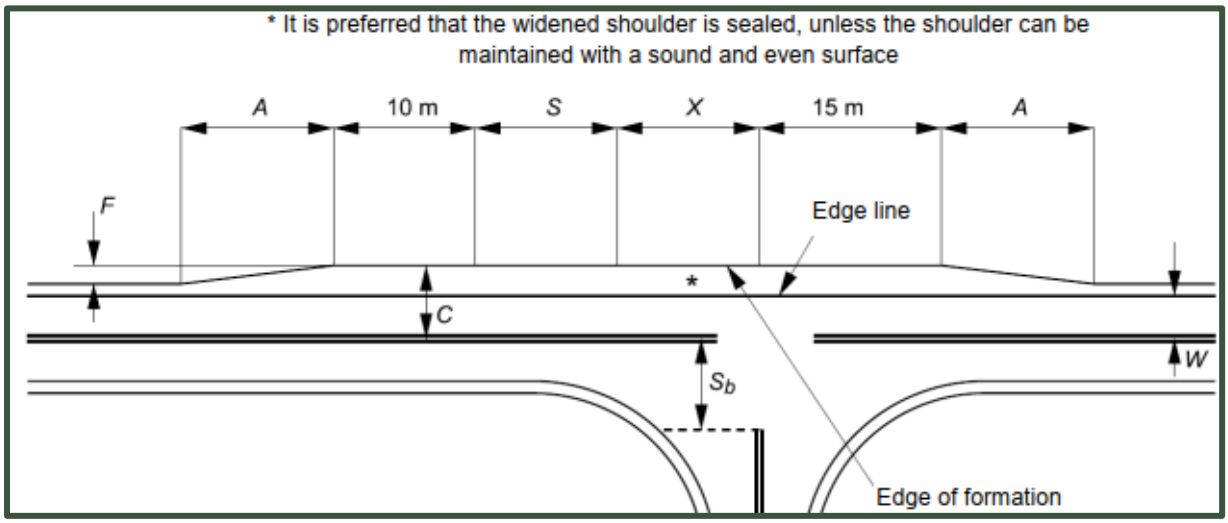
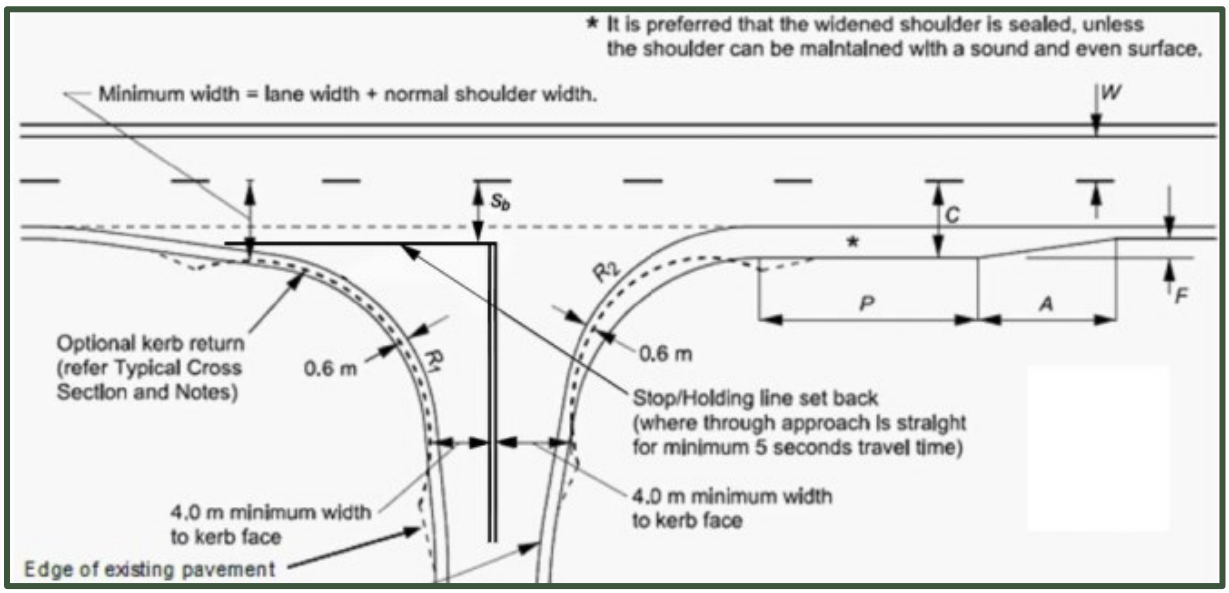


Figure 19 Rural Basic Left-Turn (BAL) Treatment



8.2 Sealing of Turkey Flat Road Intersection

SLR recommends a minimum of one design vehicle's length be sealed on Turkey Flat Road at the Eneabba-Three Springs Road intersection (southeastern leg of the intersection) to minimise and mitigate the migration of gravel from Turkey Flat Road onto Eneabba-Three Springs Road.

The largest design vehicle that would frequent the site is anticipated to be the 27.5m long B-Double design vehicle. The OSOM vehicle proposed for transporting transformers is not considered critical, given only four transformers are required for the proposed project.

8.3 Construction Traffic Management Plant (CTMP)

A CTMP or equivalent document should be prepared following approval but prior to the substantial commencement of construction activities. It would be appropriate for the CTMP to be prepared in accordance with the requirements set out by the relevant regulatory bodies.

The purpose of the CTMP would be to identify any changes to Project planning that occur subsequent to the preparation of this assessment and the impact of these changes on the conclusions of this assessment. In addition, the document would typically detail impact mitigation strategies, including soft strategies such as busing the workforce as what is assumed herein and hard strategies such as the road works as proposed for the intersection of Eneabba-Three Springs Road/ Turkey Flat Road.

The CTMP should mention the use of shuttle buses to transport the project workforce and heavy vehicle trip management procedures such as pilot vehicles and escorts, temporary signage and notification to nearby properties, safety management for any travel through school zones or dense urban areas and addressing access warrants.

The CTMP should also provide operational information, such as the maintenance contractor's contact details. However, it is not considered necessary to investigate the operational impacts in detail, given solar farms and BESSs require minimal maintenance effort.

8.4 B-Double Approval for Turkey Flat Road

Following a review of MRWA 27.5m Oversize B-Double Network (Document No. D20#390030), it is understood that the use of these vehicles is approved for Turkey Flat Road without needing to obtain a permit, subject to all 27.5m B-Double vehicle drivers do not exceed 60km/h on Turkey Flat Road.

8.5 OSOM Route Study

It is recommended that an OSOM material transportation assessment (A Route Study) for the transportation of the four transformers from the port of import to the development site, following the approval of the DA application and the confirmation of the port of import and type/ quantity of the equipment.

This report should consider all aspects of the preferred route in its entirety, such as bridge and tunnel clearances (from a vertical perspective) and carriageway widths, such as tight turns (from a horizontal perspective).

8.6 Dilapidation Surveys

It is recommended that dilapidation surveys be undertaken to assess the condition of Eneabba-Three Springs Road and Turkey Flat Road to identify changes prior to and subsequent to the completion of the proposed construction works.

9.0 Conclusion

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Trina Solar (or The Applicant) to provide traffic and transport engineering input to support the proposed Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project Project (Project) in Turkey Flat Road, Kadathinni, WA. This Traffic Impact Assessment (TIA) will form a part of the DA preparation process. Based on the analysis and discussion documented in this report, the following is concluded:

- It is proposed that vehicular access to/ from the development will be provided via Turkey Flat Road.
- The Project will generate additional traffic of approximately 13,907 inbound and 13,907 outbound trips during the assumed construction period of 12 months or 312 workdays. As a result, the daily traffic generation is anticipated to be in the order of 44-45 inbound and 44-45 outbound trips a day.
- It was identified that the intersections of Brand Highway/ Eneabba-Three Springs Road and Eneabba-Three Springs Road/ Turkey Flat Road will continue operating satisfactorily during the construction of the project.
- Based on the turn warrant assessments, it is concluded that the existing configurations of Brand Highway/ Eneabba-Three Springs Road and Eneabba-Three Springs Road/ Turkey Flat Road intersections are sufficient to accommodate the construction traffic.
- Intersection performance analysis was undertaken at four study intersections (two existing intersections and two proposed new site access driveways). Based on this analysis, it is concluded that the road network, in its existing form, will accommodate the traffic impacts of the proposed project.
- The publicly available crash dataset for the surroundings of the development site does not indicate any recurring crash type or theme that would preclude or warrant significant safety mitigations.
- Sight distances available at the Brand Highway/ Eneabba-Three Springs Road and Eneabba-Three Springs Road/ Turkey Flat Road intersections exceed the Safe Intersection Sight Distance (SISD) requirements of the Austroads Guidelines.

As per the analysis provided in this report, the following is recommended:

1 The Eneabba-Three Springs Road/ Turkey Flat Road intersection be upgraded with BAR and BAL treatments to improve road safety. It is also recommended that the Applicant continue consultations with the Council regarding the intersection upgrades.

2 Although not strictly necessary, one design vehicle's length (27.5m) be sealed on Turkey Flat Road at the Eneabba-Three Springs Road intersection (southeastern leg of the intersection) to minimise and mitigate the migration of gravel from Turkey Flat Road onto Eneabba-Three Springs Road.

3 A construction traffic management plan (CTMP) is to be prepared following the approval of the DA.

4 The construction workforce is briefed on the recommended route with a Drivers' Code of Conduct prepared by the applicant. During construction, 60 km/h speed restrictions for B-Double design vehicles should be followed on Turkey Flat Road.

5 An OSOM material route study be prepared following the approval of the DA.

6 Dilapidation reports be prepared for the review of the Council.

Appendix A Concept Plans

Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project

Transport Impact Assessment

Trina Solar

SLR Project No.: 675.072651.00007

1 April 2025

SYSTEM SPECIFICATION (AC COUPLED)

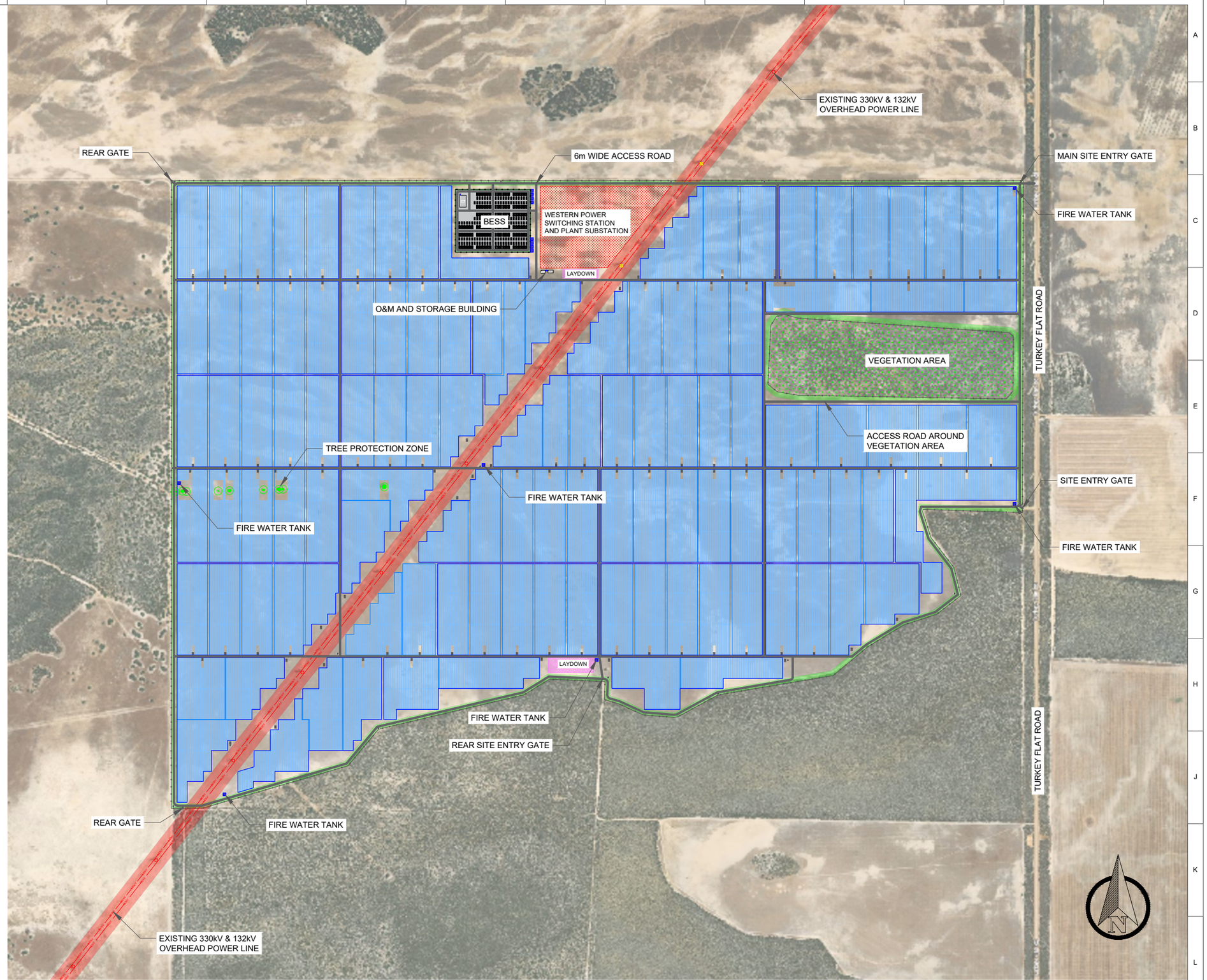
GRID CONNECTION VOLTAGE	330kV SINGLE/DOUBLE CIRCUIT(S)
POC CAPACITY	400 MW
BESS CAPACITY (25°C)	2072~2527 MWh
CHARGING/DISCHARGING HOURS	4 HOURS
BESS INVERTER MAX POWER (40°C)	529.2 MVA
BESS INVERTER STATION	PE PCSM FP4203MH4
No. INVERTER / MV STATION	126
BESS MODEL	BESS CONTAINER
No. BESS CONTAINER	504
PV CAPACITY (STC)	480 MWp / 400 MWac
PV MODULE	TSM-NEG21C.20 720Wp
STRING SIZE	28
84 MODULES TRACKERS	7718
56 MODULES TRACKERS	653
TRACKER	SINGLE AXIS TRACKING
PITCH	5.1 METERS
PV INVERTER MAX POWER (40°C)	478.8 MVA
PV INVERTER STATION	PE HEM FS4202MH
No. INVERTER / MV STATION	114
SITE AREA	624.2 Ha
RESERVED VEGETATION AREA	24.96 Ha
SUBSTATION AREA	11.5 Ha
BESS AREA	6.7 Ha
SITE FENCE	13,210 METERS
INTERNAL ACCESS ROAD	26,034 METERS

NOTES

1. THIS LAYOUT IS FOR PLANNING PURPOSE ONLY SUBJECT TO CHANGE.
2. SUBSTATION, INVERTER, BESS, PV LOCATION TO BE CONFIRMED.
3. GRID CONNECTION POINT AND ARRANGEMENT TO BE CONFIRMED.
4. 20 METERS WIDE SITE FIRE BREAK CLEARANCE PERIMETER BUFFER.
5. 6 METERS WIDE INTERNAL UNSEALED OR SEALED ROAD.
6. SITE ENTRY AND ACCESS ROAD TO BE CONFIRMED.
7. SOLAR FARM AND BESS CAPACITY AND OPTIONS TO BE CONFIRMED.

LEGEND

- INTERNAL PERIMETER CLEARANCE AND FIRE BREAK BUFFER
- POWER LINE EASEMENT BUFFER
- INVERTER STATION
- BATTERY CONTAINER
- SITE BOUNDARY PERIMETER FENCE
- LAND BOUNDARY FENCE
- INTERNAL SEALED OR UNSEALED ROAD
- BESS FOUNDATION AREA
- OVERHEAD POWER LINE
- RESERVED VEGETATION AREA
- METEOROLOGICAL STATION
- CCTV SURVEILLANCE CAMERA
- FIRE WATER TANK FOR PV ARRAY, BESS, AND BUILDINGS



CLIENT
TRINA SOLAR

PROJECT
TATHRA PV BESS PLANT

TURKEY FLAT ROAD, KADATHINNI, WA 6519
-29.674897, 115.594014

CHECK	
DESIGNER	WILSON JIN
DRAFTER	WILSON JIN
PROJECT MANAGER	EDWARD WANG
PROJECT DIRECTOR	JOSE FLORES

REVISION	DATE	CHECKED BY	APPROVED BY
1.0 INITIAL DRAFT	2023/11/29	-	-
2.0 LAYOUT UPDATE	2024/04/30	-	-
3.0AAC COUPLED BESS UPDATE	2025/03/07	-	-
- -	-	-	-
- -	-	-	-
- -	-	-	-
- -	-	-	-

PRELIMINARY NOT FOR CONSTRUCTION

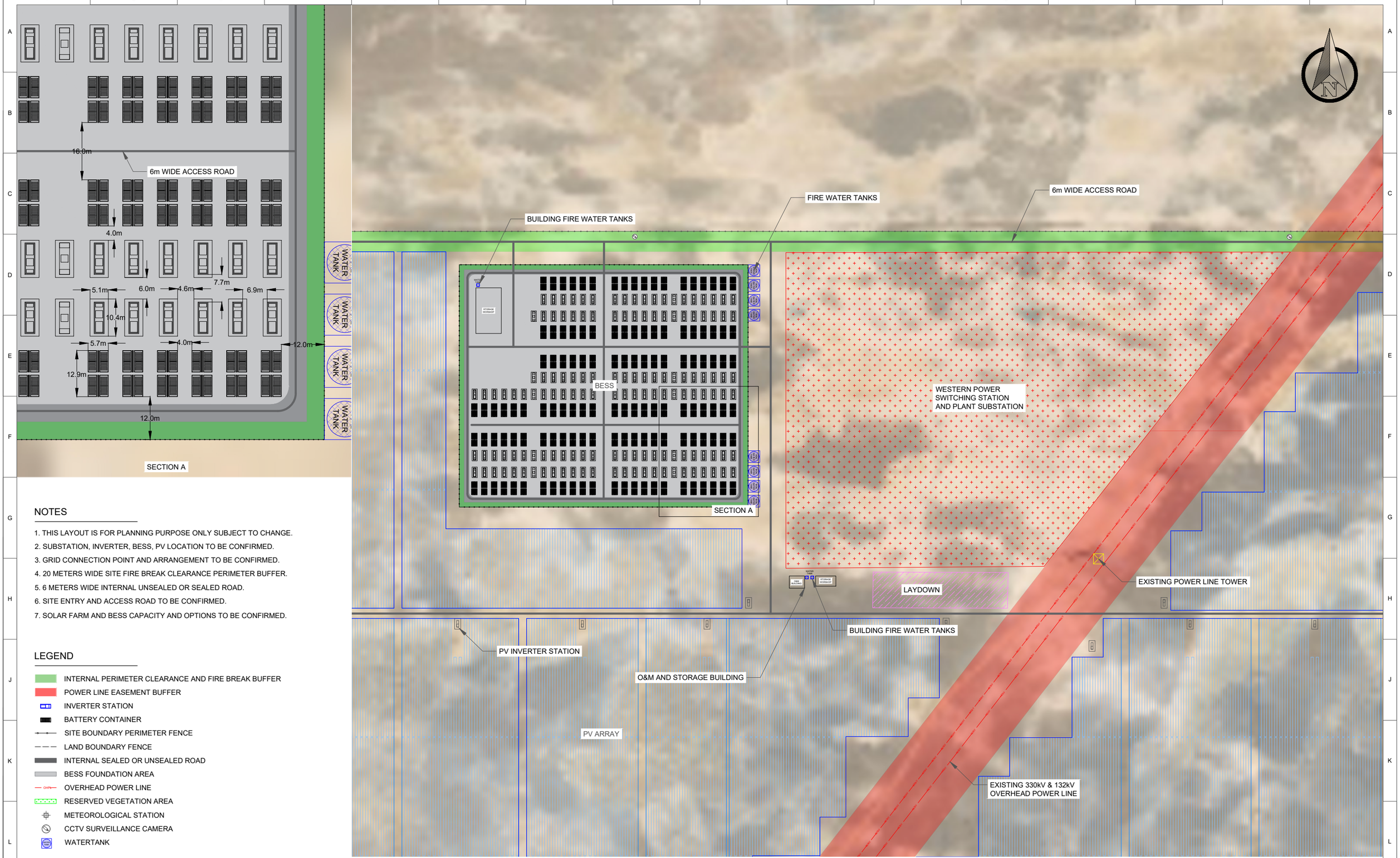
TITLE
SOLAR FARM OVERVIEW

DRAWING NUMBER	REVISION	PAGE
TRN-THSP-GN-DWG-001	3.0A	1 / 2

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A1 841 x 594

CAD



NOTES

1. THIS LAYOUT IS FOR PLANNING PURPOSE ONLY SUBJECT TO CHANGE.
2. SUBSTATION, INVERTER, BESS, PV LOCATION TO BE CONFIRMED.
3. GRID CONNECTION POINT AND ARRANGEMENT TO BE CONFIRMED.
4. 20 METERS WIDE SITE FIRE BREAK CLEARANCE PERIMETER BUFFER.
5. 6 METERS WIDE INTERNAL UNSEALED OR SEALED ROAD.
6. SITE ENTRY AND ACCESS ROAD TO BE CONFIRMED.
7. SOLAR FARM AND BESS CAPACITY AND OPTIONS TO BE CONFIRMED.

LEGEND

- INTERNAL PERIMETER CLEARANCE AND FIRE BREAK BUFFER
- POWER LINE EASEMENT BUFFER
- INVERTER STATION
- BATTERY CONTAINER
- SITE BOUNDARY PERIMETER FENCE
- LAND BOUNDARY FENCE
- INTERNAL SEALED OR UNSEALED ROAD
- BESS FOUNDATION AREA
- OVERHEAD POWER LINE
- RESERVED VEGETATION AREA
- METEOROLOGICAL STATION
- CCTV SURVEILLANCE CAMERA
- WATERTANK

CLIENT
TRINA SOLAR

PROJECT
TATHRA PV BESS PLANT
TURKEY FLAT ROAD, KADATHINNI, WA 6519
-29.674897, 115.594014

CHECK	
DESIGNER	WILSON JIN
DRAFTER	WILSON JIN
PROJECT MANAGER	EDWARD WANG
PROJECT DIRECTOR	JOSE FLORES

REVISION	DATE	CHECKED BY	APPROVED BY
1.0 INITIAL DRAFT	2023/11/29	-	-
2.0 LAYOUT UPDATE	2024/04/30	-	-
3.0AAC COUPLED BESS UPDATE	2025/03/07	-	-
- -	-	-	-
- -	-	-	-
- -	-	-	-
- -	-	-	-

PRELIMINARY NOT FOR CONSTRUCTION

TITLE
SUBSTATION AND BESS PLAN

DRAWING NUMBER	REVISION	PAGE
TRN-THSP-GN-DWG-001	3.0A	2 / 2

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A1 841 x 594

CAD

Appendix B Traffic Surveys

Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project

Transport Impact Assessment

Trina Solar

SLR Project No.: 675.072651.00007

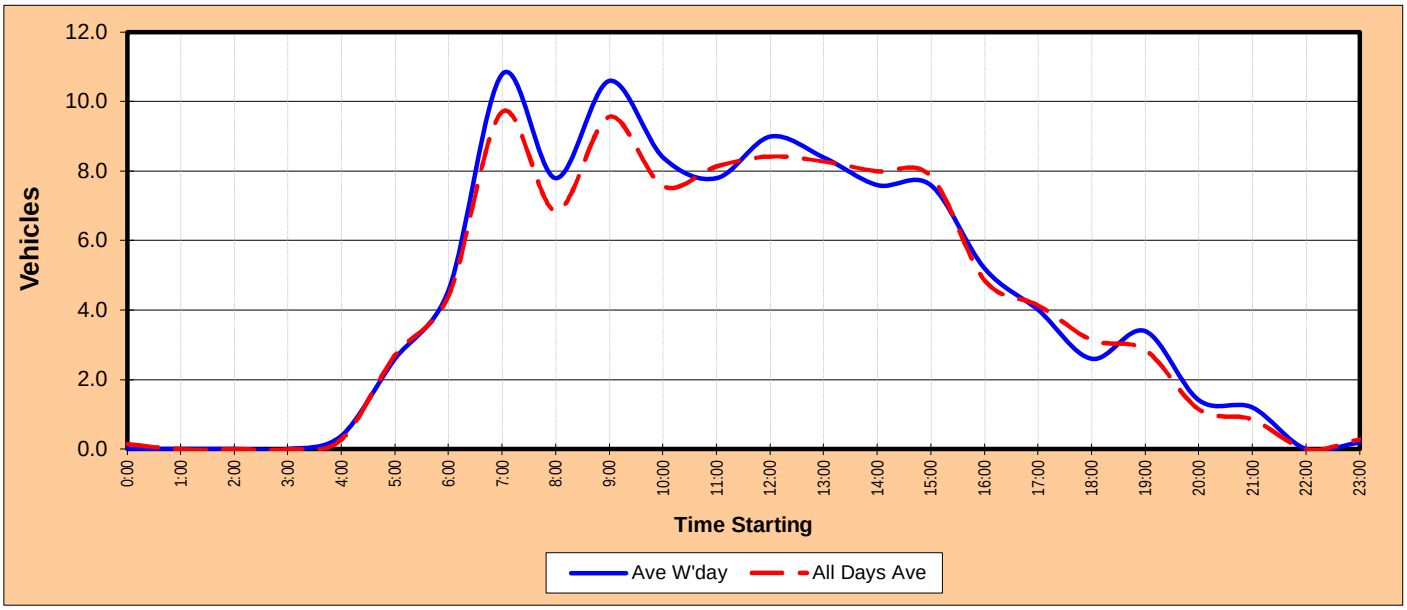
1 April 2025

Volume Summary

Road	Three Springs
Location	Eneabba Rd - 500m west of Turkey Flat Rd
Suburb	Kadathinni
Site No.	Three-01
Start Date	Wednesday 30/10/2024
Direction	Two ways

Average Weekday	104
All Day Average	99
Weekday Heavy's	52.1%
All Day Heavy's	54.1%

Starting Time	Day of Week							Ave W'day	All Days Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	04-Nov	05-Nov	30-Oct	31-Oct	01-Nov	02-Nov	03-Nov		
AM Peak	**12**	**13**	**18**	**9**	**14**	**10**	**8**		
PM Peak	**12**	**10**	**11**	**10**	**11**	**11**	**11**		
0:00	0	0	0	0	0	0	1	0	0
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	0	1	1	0	0	0	0	0	0
5:00	4	3	2	3	1	3	3	3	3
6:00	4	2	1	8	8	6	2	5	4
7:00	11	11	18	9	5	8	6	11	10
8:00	9	13	7	7	3	5	4	8	7
9:00	12	7	13	7	14	6	8	11	10
10:00	8	9	8	7	10	6	5	8	8
11:00	11	5	8	9	6	10	8	8	8
12:00	12	6	11	8	8	3	11	9	8
13:00	7	4	10	10	11	9	7	8	8
14:00	10	8	5	9	6	11	7	8	8
15:00	3	10	10	6	9	8	9	8	8
16:00	3	6	8	3	6	4	4	5	5
17:00	4	2	4	2	8	6	3	4	4
18:00	4	3	2	3	1	5	4	3	3
19:00	5	5	3	1	3	2	1	3	3
20:00	1	1	2	1	2	1	0	1	1
21:00	1	0	2	2	1	0	0	1	1
22:00	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	1	1	0	0	0
Total	**109**	**96**	**115**	**95**	**103**	**94**	**83**	**104**	**99**
% Heavies	**53.2%**	**57.3%**	**56.5%**	**46.3%**	**46.6%**	**60.6%**	**59.0%**	**52.1%**	**54.1%**



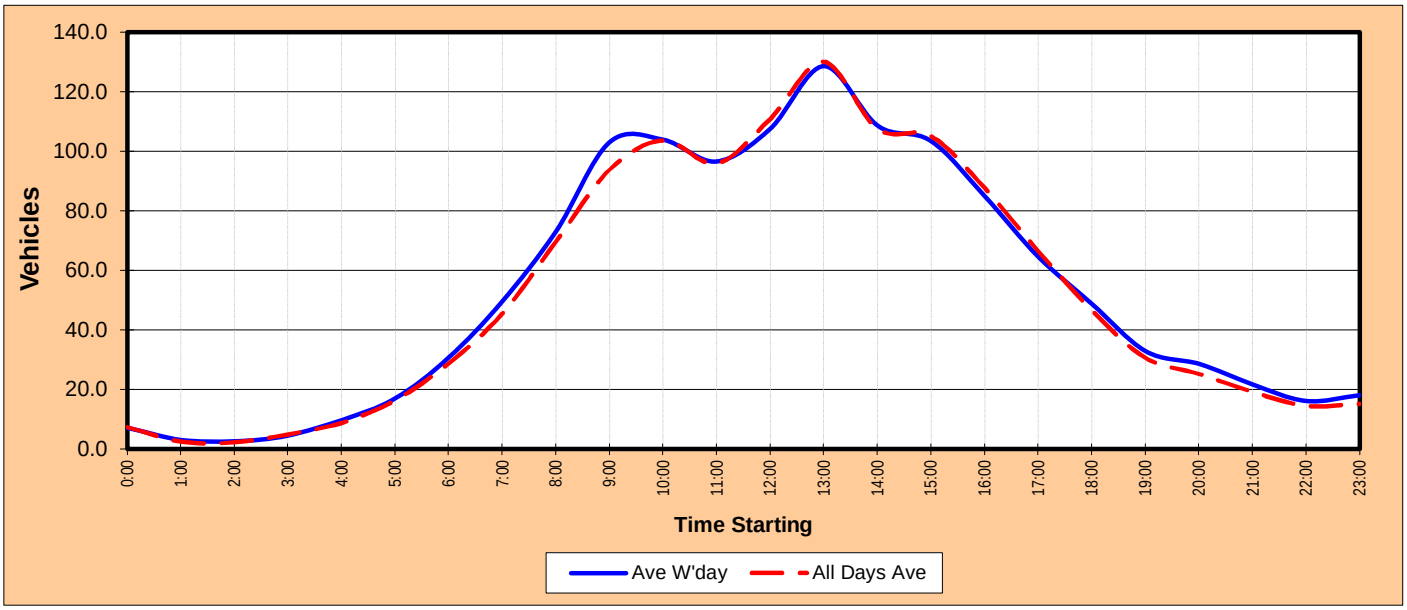
Copyright Austraffic, 1983-2016 (DatXL 3.1.35; 2.45)

Volume Summary

Road	Brand Hwy
Location	800m north of Three Springs-Eneabba Rd
Suburb	Eneabba
Site No.	Brand-01
Start Date	Thursday 07/11/2024
Direction	Northbound

Average Weekday	1266
All Day Average	1240
Weekday Heavy's	26.9%
All Day Heavy's	23.9%

Starting Time	Day of Week							Ave W'day	All Days Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	11-Nov	12-Nov	13-Nov	07-Nov	08-Nov	09-Nov	10-Nov		
AM Peak	**141**	**113**	**91**	**92**	**106**	**117**	**95**		
PM Peak	**144**	**135**	**120**	**109**	**135**	**105**	**163**		
0:00	5	10	6	8	7	14	2	7	7
1:00	4	4	2	2	4	0	2	3	3
2:00	1	3	4	3	2	2	1	3	2
3:00	4	2	4	8	5	3	9	5	5
4:00	6	10	8	15	10	8	5	10	9
5:00	15	21	12	22	15	16	14	17	16
6:00	38	31	34	23	28	34	14	31	29
7:00	42	53	48	61	45	45	25	50	46
8:00	89	80	66	61	69	59	64	73	70
9:00	141	111	77	90	96	76	66	103	94
10:00	129	113	91	92	95	117	89	104	104
11:00	125	81	91	80	106	94	95	97	96
12:00	118	101	108	90	121	104	135	108	111
13:00	144	135	120	109	135	105	163	129	130
14:00	119	97	96	102	129	81	129	109	108
15:00	114	97	94	106	107	75	143	104	105
16:00	97	69	67	93	99	72	117	85	88
17:00	71	56	53	67	76	50	93	65	67
18:00	48	41	53	49	54	38	44	49	47
19:00	33	20	32	30	50	17	33	33	31
20:00	27	31	18	37	30	15	19	29	25
21:00	25	21	27	18	18	7	19	22	19
22:00	16	20	15	14	16	13	8	16	15
23:00	20	16	22	15	18	7	9	18	15
Total	**1431**	**1223**	**1148**	**1195**	**1335**	**1052**	**1298**	**1266**	**1240**
% Heavies	**26.4%**	**32.9%**	**28.5%**	**24.9%**	**22.5%**	**19.4%**	**13.0%**	**26.9%**	**23.9%**



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Appendix C Desktop Models

Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project

Transport Impact Assessment

Trina Solar

SLR Project No.: 675.072651.00007

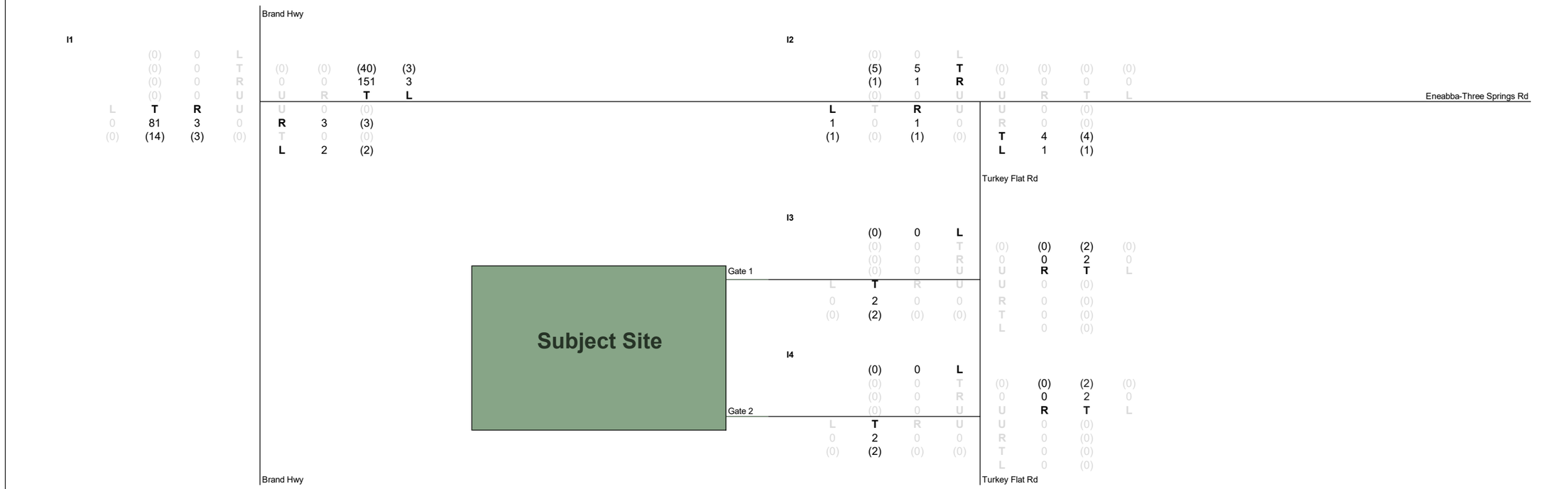
1 April 2025

Project Killawarra Solar and Battery Energy Storage System (BESS)
Project number 675.072651.00001
Prepared by JC
Reviewed by CS

Appendix **C**

TITLE BLOCK REGISTER

Sheet Name	Figure #	Figure Title
Template	XX	Template
2024 Survey AM	1	2024 Survey Traffic Volumes AM
2024 Survey PM	2	2024 Survey Traffic Volumes PM
2027 BG AM	3	2027 Background Traffic Volumes (Final Year of Construction) AM
2027 BG PM	4	2027 Background Traffic Volumes (Final Year of Construction) PM
DEV AM	5	Construction Traffic Volumes (AM)
DEV PM	6	Construction Traffic Volumes (PM)
2027 BG + DEV AM	7	2027 Background with Construction Traffic Volumes AM
2027 BG + DEV PM	8	2027 Background with Construction Traffic Volumes PM



SLR

C1

2024 Survey Traffic Volumes AM

675.072651.00001

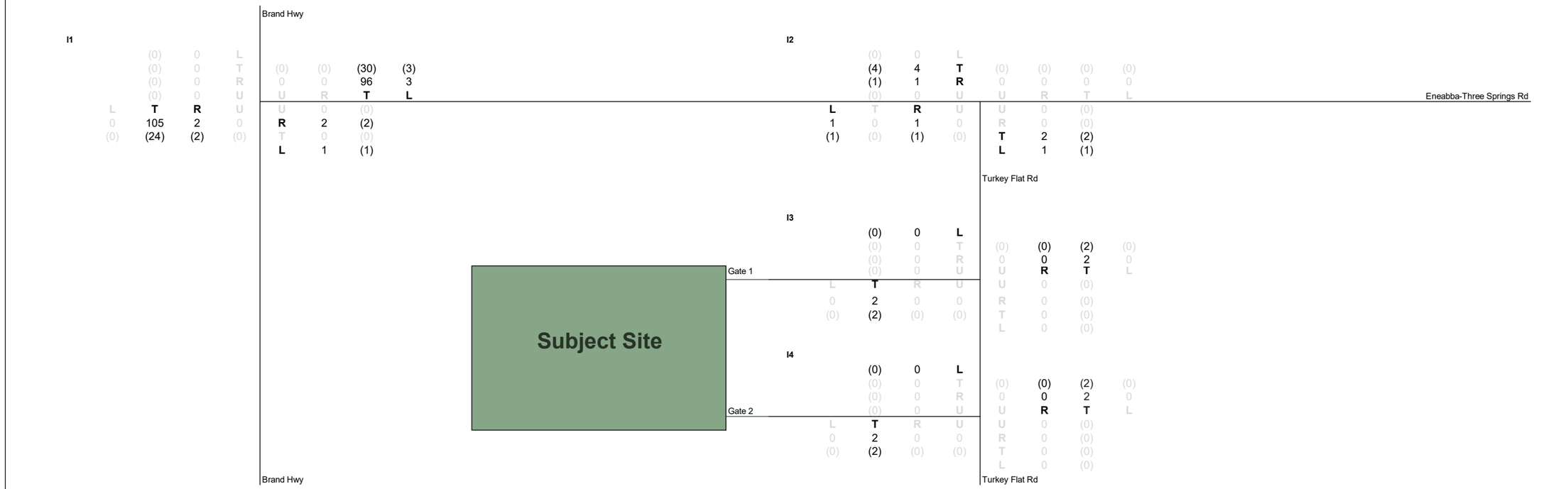
Killawarra Solar and Battery Energy Storage System (BESS)

Legend

L	Left Turn
T	Through
R	Right Turn
U	U-Turn

00 Light Vehicle Volumes
(00) Heavy Vehicle Volumes
Subject Site

N



SLR

C2

2024 Survey Traffic Volumes PM

675.072651.00001

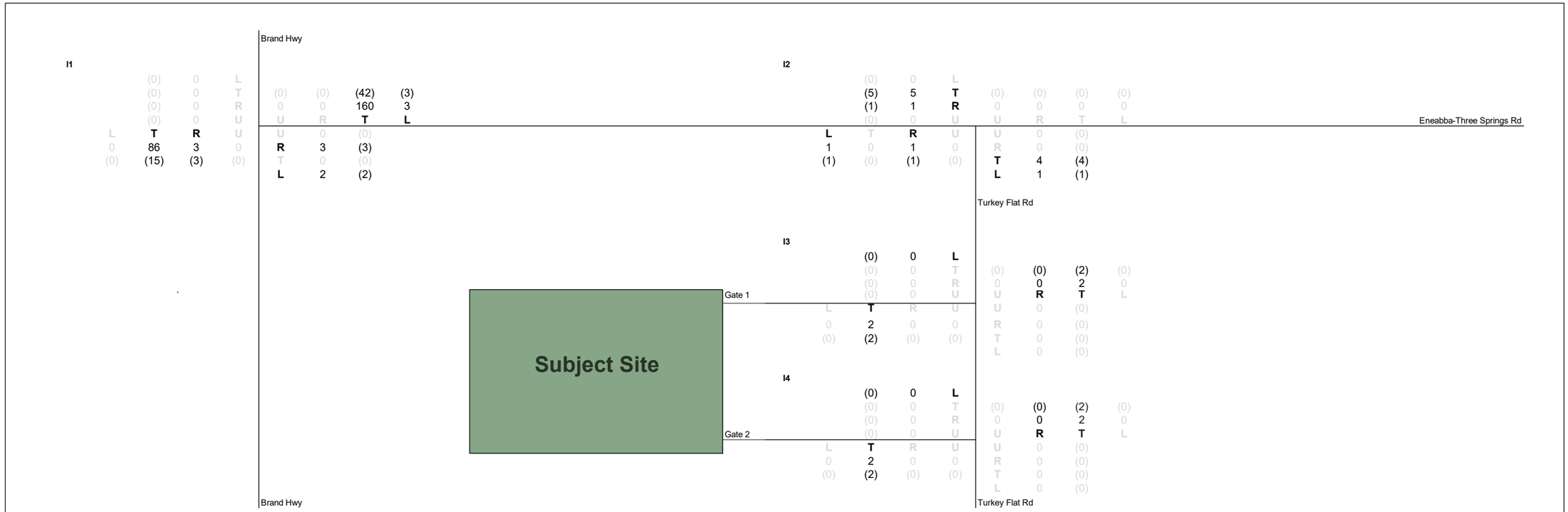
Killawarra Solar and Battery Energy Storage System (BESS)

Legend

L	Left Turn
T	Through
R	Right Turn
U	U-Turn

00 Light Vehicle Volumes
(00) Heavy Vehicle Volumes
Subject Site

N



SLR

C3

2027 Background Traffic Volumes (Final Year of Construction) AM

675.072651.00001

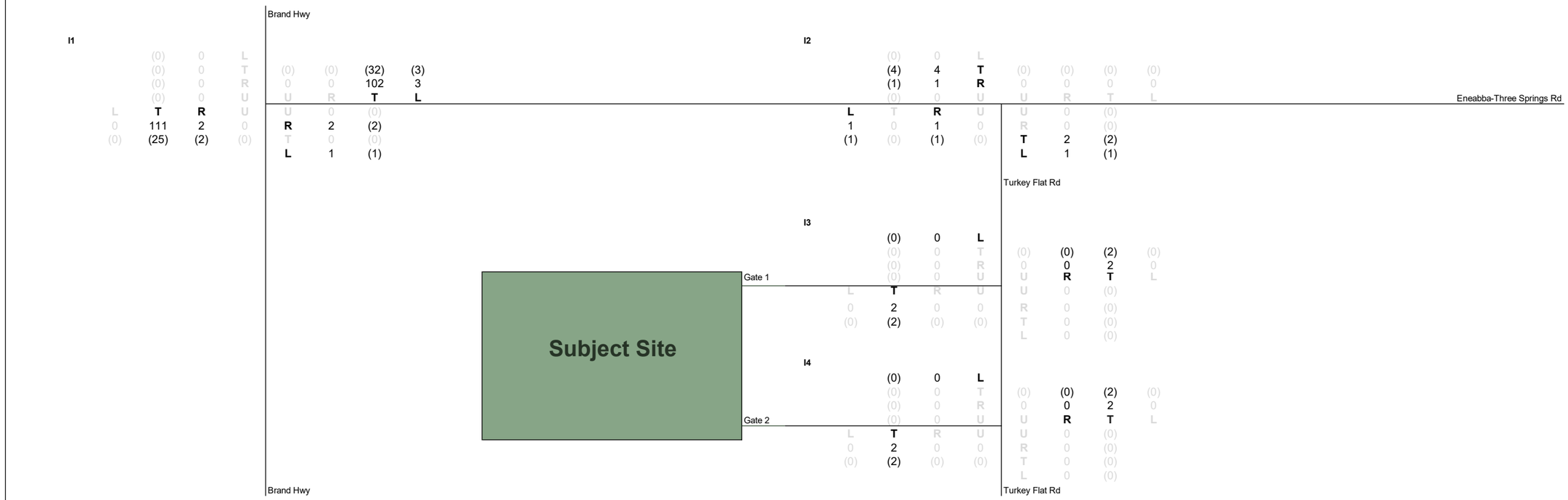
Killawarra Solar and Battery Energy Storage System (BESS)

Legend

L	Left Turn
T	Through
R	Right Turn
U	U-Turn

00 Light Vehicle Volumes
(00) Heavy Vehicle Volumes
Subject Site

N



C4

2027 Background Traffic Volumes (Final Year of Construction) PM

675.072651.00001

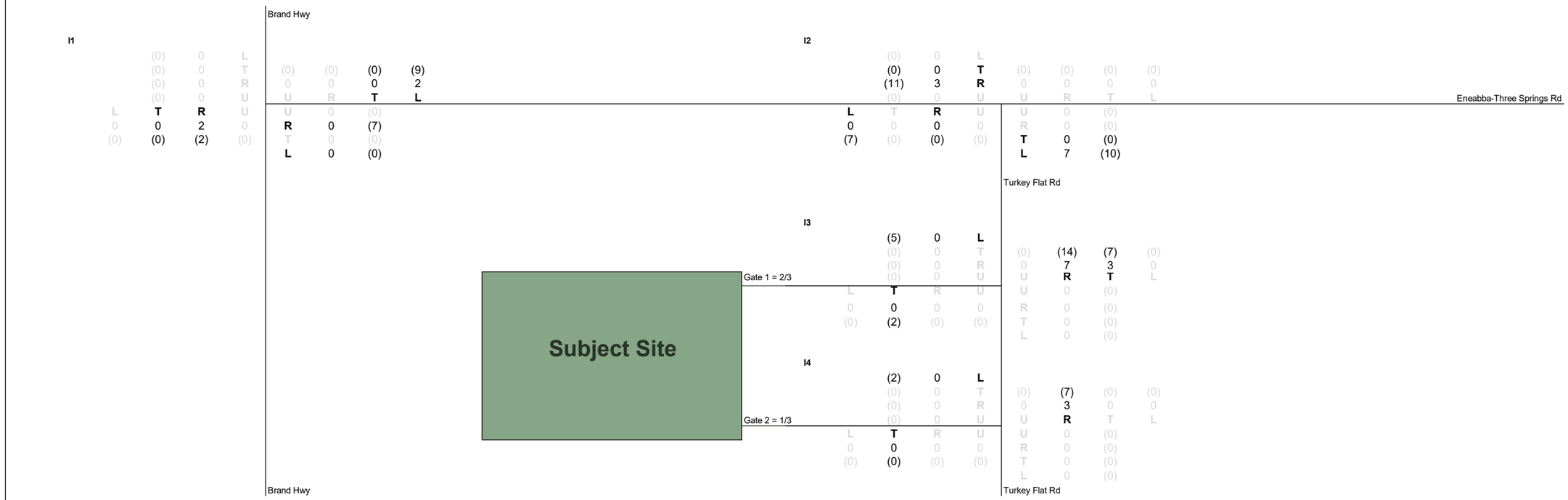
Killawarra Solar and Battery Energy Storage System (BESS)

Legend

L	Left Turn
T	Through
R	Right Turn
U	U-Turn

00 Light Vehicle Volumes
(00) Heavy Vehicle Volumes
Subject Site

N



SLR

C5

Construction Traffic Volumes (AM)

675.072651.00001

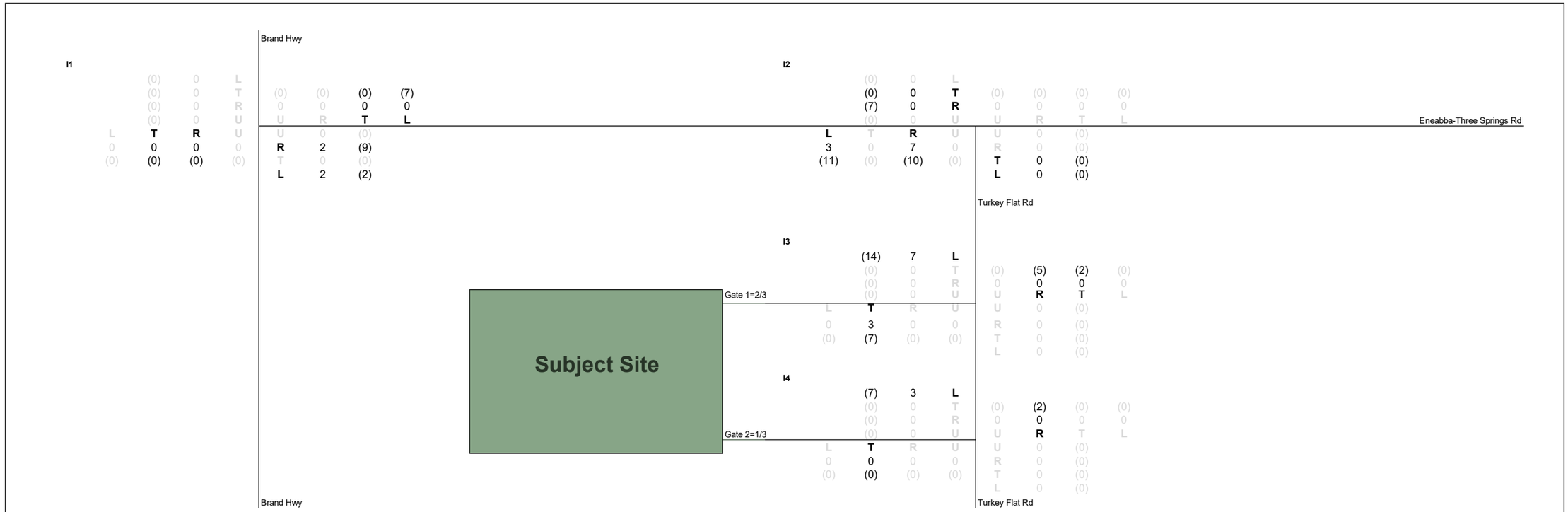
Killawarra Solar and Battery Energy Storage System (BESS)

Legend

L	Left Turn
T	Through
R	Right Turn
U	U-Turn

00 Light Vehicle Volumes
(00) Heavy Vehicle Volumes
Subject Site

N



SLR

C6

Construction Traffic Volumes (PM)

675.072651.00001

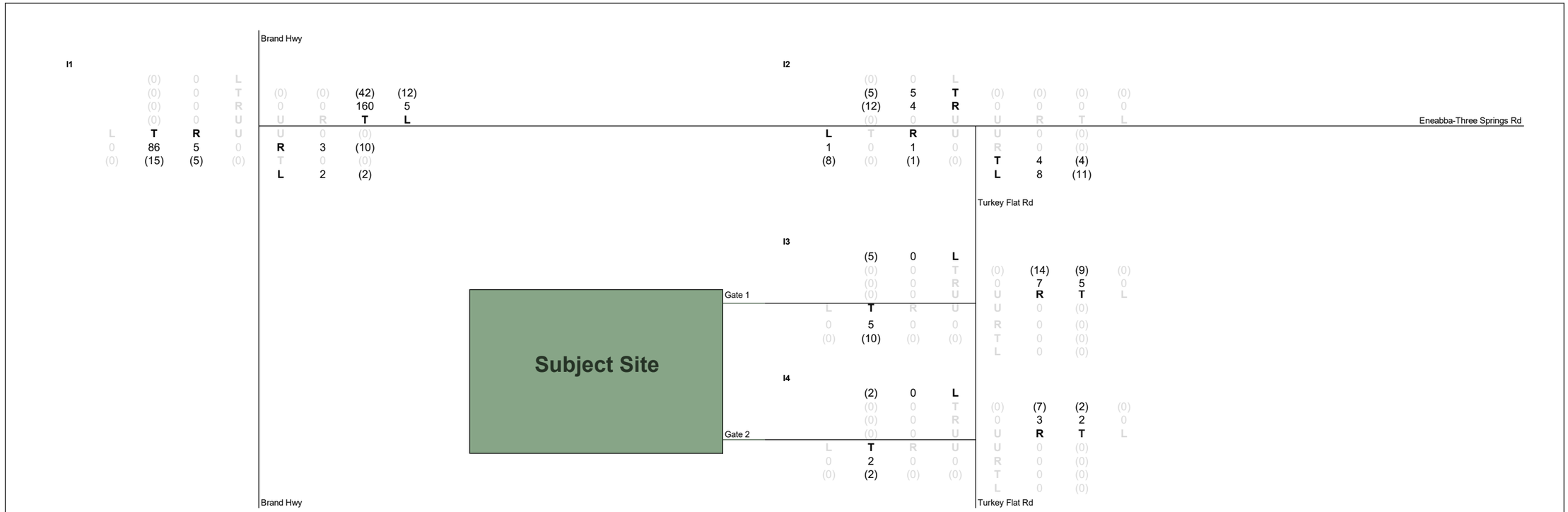
Killawarra Solar and Battery Energy Storage System (BESS)

Legend

L	Left Turn
T	Through
R	Right Turn
U	U-Turn

00 Light Vehicle Volumes
(00) Heavy Vehicle Volumes
Subject Site

N



SLR

C7

2027 Background with Construction Traffic Volumes AM

675.072651.00001

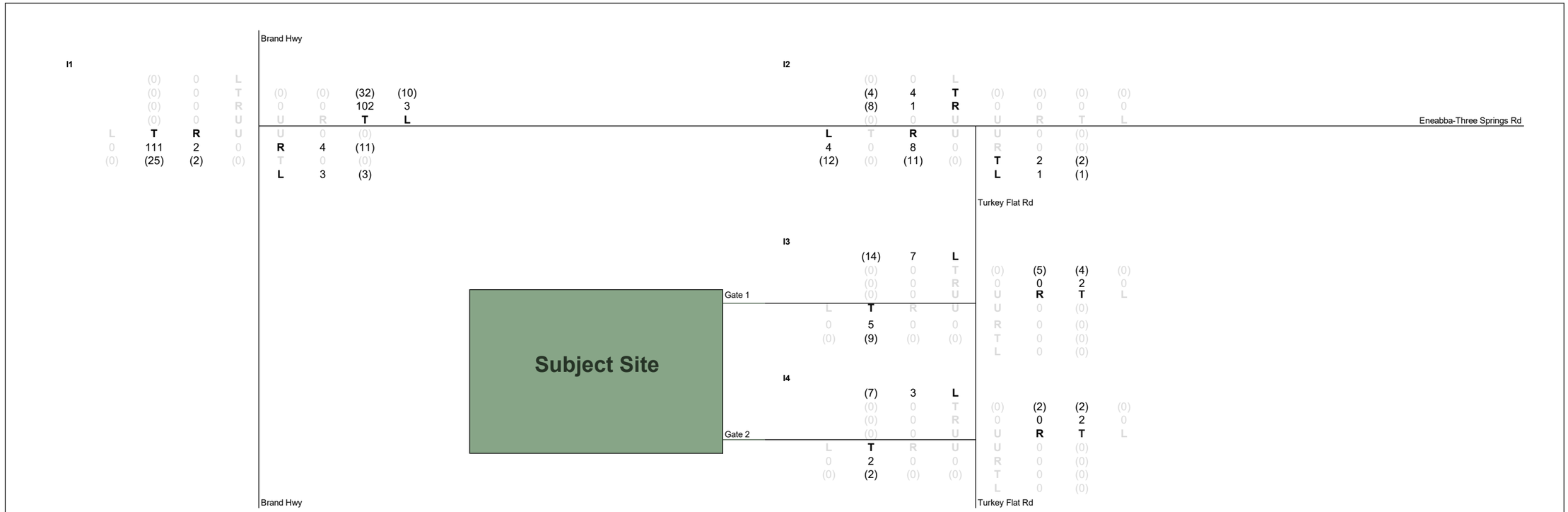
Killawarra Solar and Battery Energy Storage System (BESS)

Legend

L	Left Turn
T	Through
R	Right Turn
U	U-Turn

00 Light Vehicle Volumes
(00) Heavy Vehicle Volumes
Subject Site

N



SLR

C8

2027 Background with Construction Traffic Volumes PM

675.072651.00001

Killawarra Solar and Battery Energy Storage System (BESS)

Legend

L	Left Turn
T	Through
R	Right Turn
U	U-Turn

00 Light Vehicle Volumes
(00) Heavy Vehicle Volumes
Subject Site

N

Appendix D Turn Warrant Assessments

Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project

Transport Impact Assessment

Trina Solar

SLR Project No.: 675.072651.00007

1 April 2025

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Traffc Management - Part 6, Sec 3.3.6

Version: 2.01

DESIGN SPEED =	120km/h
SPLITTER ISLAND YES / NO =	No
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	Std HV (Class 2-9) (%)	Road Trains (Class 10+) (%)
Q_{T1} =	101	24	4
Q_R =	10	0	50
Q_{T2} =	202	20	8
Q_L =	17	0	71
Q_{LM} =	4	0	50
Q_{RM} =	13	0	77

RIGHT TURN ASSESSMENT

Q_M =	320
% HV =	30.826
x =	1.40
TREATMENT =	AUR

LEFT TURN ASSESSMENT

Q_M =	202
% HV =	28.70
x =	1.11
TREATMENT =	AUL
OFFSET?	NO

Intersection 1 - AM Peak Hour - 2027 DEVELOPMENT TRAFFIC SCENARIO
Intersection of Eneabba-Three Springs Road & Brand Highway

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Traffc Management - Part 6, Sec 3.3.6

Version: 2.01

DESIGN SPEED =	120km/h
SPLITTER ISLAND YES / NO =	No
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	Std HV (Class 2-9) (%)	Road Trains (Class 10+) (%)
Q_{T1} =	137	21	6
Q_R =	4	0	50
Q_{T2} =	134	29	2
Q_L =	13	0	77
Q_{LM} =	6	0	50
Q_{RM} =	15	0	73

RIGHT TURN ASSESSMENT

Q_M =	284
% HV =	31.074
x =	0.85
TREATMENT =	SR

LEFT TURN ASSESSMENT

Q_M =	134
% HV =	30.58
x =	0.65
TREATMENT =	BAL
OFFSET?	NO

Intersection 1 - PM Peak Hour - 2027 DEVELOPMENT TRAFFIC SCENARIO
Intersection of Eneabba-Three Springs Road & Brand Highway

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Traffc Management - Part 6, Sec 3.3.6

Version: 2.01

DESIGN SPEED =	120km/h
SPLITTER ISLAND YES / NO =	No
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	Std HV (Class 2-9) (%)	Road Trains (Class 10+) (%)
Q_{T1} =	11	10	30
Q_R =	16	0	50
Q_{T2} =	8	38	38
Q_L =	19	0	77
Q_{LM} =	9	0	50
Q_{RM} =	2	0	73

RIGHT TURN ASSESSMENT

Q_M =	38
% HV =	65.868
x =	0.38
TREATMENT =	BAR

LEFT TURN ASSESSMENT

Q_M =	8
% HV =	75.00
x =	0.09
TREATMENT =	BAL
OFFSET?	NO

Intersection 2 - AM Peak Hour - 2027 DEVELOPMENT TRAFFIC SCENARIO
Intersection of Eneabba-Three Springs Road & Turkey Flat Road

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Traffc Management - Part 6, Sec 3.3.6

Version: 2.01

DESIGN SPEED =	120km/h
SPLITTER ISLAND YES / NO =	No
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	Std HV (Class 2-9) (%)	Road Trains (Class 10+) (%)
Q_{T1} =	8	13	50
Q_R =	9	0	50
Q_{T2} =	4	25	50
Q_L =	2	0	50
Q_{LM} =	16	0	75
Q_{RM} =	19	0	58

RIGHT TURN ASSESSMENT

Q_M =	14
% HV =	64.286
x =	0.12
TREATMENT =	BAR

LEFT TURN ASSESSMENT

Q_M =	4
% HV =	75.00
x =	0.02
TREATMENT =	SL
OFFSET?	NO

Intersection 2 - PM Peak Hour - 2027 DEVELOPMENT TRAFFIC SCENARIO
Intersection of Eneabba-Three Springs Road & Turkey Flat Road

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Traffc Management - Part 6, Sec 3.3.6

Version: 2.01

DESIGN SPEED =	120km/h
SPLITTER ISLAND YES / NO =	No
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	Std HV (Class 2-9) (%)	Road Trains (Class 10+) (%)
Q_{T1} =	15	0	60
Q_{R} =	21	0	67
Q_{T2} =	15	0	67
Q_{L} =	0	0	0
Q_{LM} =	5	0	100
Q_{RM} =	0	0	0

RIGHT TURN ASSESSMENT

Q_{M} =	30
% HV =	63.500
x =	0.36
TREATMENT =	BAR

LEFT TURN ASSESSMENT

Q_{M} =	15
% HV =	67.00
x =	0.00
TREATMENT =	SL
OFFSET?	NO

Intersection 3 - AM Peak Hour - 2027 DEVELOPMENT TRAFFIC SCENARIO
Intersection of Site Access Gate 1 & Turkey Flat Road

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Traffc Management - Part 6, Sec 3.3.6

Version: 2.01

DESIGN SPEED =	120km/h
SPLITTER ISLAND YES / NO =	No
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	Std HV (Class 2-9) (%)	Road Trains (Class 10+) (%)
Q_{T1} =	7	0	57
Q_R =	5	0	100
Q_{T2} =	15	0	60
Q_L =	0	0	0
Q_{LM} =	21	0	67
Q_{RM} =	0	0	0

RIGHT TURN ASSESSMENT

Q_M =	22
% HV =	59.045
x =	0.14
TREATMENT =	SR

LEFT TURN ASSESSMENT

Q_M =	15
% HV =	60.00
x =	0.00
TREATMENT =	SL
OFFSET?	NO

Intersection 3 - PM Peak Hour - 2027 DEVELOPMENT TRAFFIC SCENARIO
Intersection of Site Access Gate 1 & Turkey Flat Road

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Traffc Management - Part 6, Sec 3.3.6

Version: 2.01

DESIGN SPEED =	120km/h
SPLITTER ISLAND YES / NO =	No
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	Std HV (Class 2-9) (%)	Road Trains (Class 10+) (%)
Q_{T1} =	4	0	50
Q_R =	10	0	70
Q_{T2} =	4	0	50
Q_L =	0	0	0
Q_{LM} =	2	0	100
Q_{RM} =	0	0	0

RIGHT TURN ASSESSMENT

Q_M =	8
% HV =	50.000
x =	0.07
TREATMENT =	BAR

LEFT TURN ASSESSMENT

Q_M =	4
% HV =	50.00
x =	0.00
TREATMENT =	SL
OFFSET?	NO

Intersection 4 - AM Peak Hour - 2027 DEVELOPMENT TRAFFIC SCENARIO
Intersection of Site Access Gate 2 & Turkey Flat Road

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Traffc Management - Part 6, Sec 3.3.6

Version: 2.01

DESIGN SPEED =	120km/h
SPLITTER ISLAND YES / NO =	No
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	Std HV (Class 2-9) (%)	Road Trains (Class 10+) (%)
Q_{T1} =	4	0	50
Q_R =	2	0	100
Q_{T2} =	4	0	50
Q_L =	0	0	0
Q_{LM} =	10	0	70
Q_{RM} =	0	0	0

RIGHT TURN ASSESSMENT

Q_M =	8
% HV =	50.000
x =	0.04
TREATMENT =	SR

LEFT TURN ASSESSMENT

Q_M =	4
% HV =	50.00
x =	0.00
TREATMENT =	SL
OFFSET?	NO

Intersection 4 - PM Peak Hour - 2027 DEVELOPMENT TRAFFIC SCENARIO
Intersection of Site Access Gate 2 & Turkey Flat Road

Appendix E Swept Path Assessments

Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project

Transport Impact Assessment

Trina Solar

SLR Project No.: 675.072651.00007

1 April 2025



SLR
LEVEL 16, 175 EAGLE ST
BRISBANE
QUEENSLAND 4000
AUSTRALIA
T: 61 7 3858 4800
www.slrconsulting.com

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Project No:	675.072651.00007
Date:	24/02/2025
Drawn by:	CS
Certified by:	DM
Sheet Size:	A4
Projection:	GDA2020 MGA Zone 50

SWEPT PATH LEGEND
- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheels

N

0.0 10 20 30 40
METRES
SCALE 1:1000

Trina Solar Pty Ltd

Killawarra Solar and BESS

250T Transformer Transportation

FIGURE SK01

CONCEPT ONLY

HARD STAND MAY BE REQUIRED
FOR TRANSFORMER TRANSPORTATION

ENEABBA-THREE SPRINGS ROAD

TURKEY FLAT ROAD

SLR

LEVEL 16, 175 EAGLE ST
BRISBANE
QUEENSLAND 4000
AUSTRALIA
T: 61 7 3858 4800

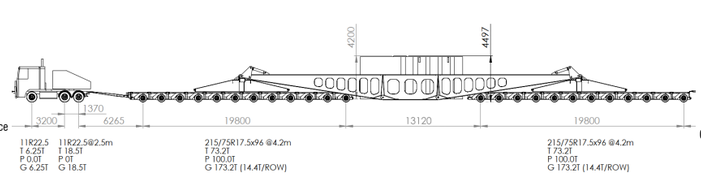
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Date:	24/02/2025
Drawn by:	CS
Certified by:	DM
Sheet Size:	A3
Projection:	GDA2020 MGA Zone 50

SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheels



N

0.0 15 30 45 60
METRES

SCALE 1:1500

Trina Solar Pty Ltd

Killawarra Solar and BESS

250T Transformer Transportation

FIGURE SK02



SLR
LEVEL 16, 175 EAGLE ST
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Date:	24/02/2025
Drawn by:	CS
Certified by:	DM
Sheet Size:	A4
Projection:	GDA2020 MGA Zone 50

SWEPT PATH LEGEND
- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheels

N

0.0 7.5 15 22.5 30
METRES
SCALE 1:750

Trina Solar Pty Ltd

Killawarra Solar and BESS

27.5m B-Double Design Vehicle

FIGURE SK03

CONCEPT ONLY

ENEABBA-THREE SPRINGS ROAD

TURKEY FLAT ROAD

HARDSTAND MAY BE REQUIRED FOR THE INFREQUENT CONCURRENT MOVEMENTS

SLR

LEVEL 16, 175 EAGLE ST
BRISBANE
QUEENSLAND 4000
AUSTRALIA
T: 61 7 3858 4800

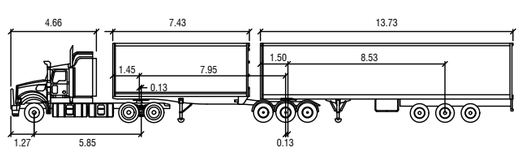
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Project No:	675.072651.00007
Date:	24/02/2025
Drawn by:	CS
Certified by:	DM
Sheet Size:	A3
Projection:	GDA2020 MGA Zone 50

SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheels



Maxi-CUBE Dry Freight B-double

meters

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 39.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

N

0.0 7.5 15 22.5 30
METRES

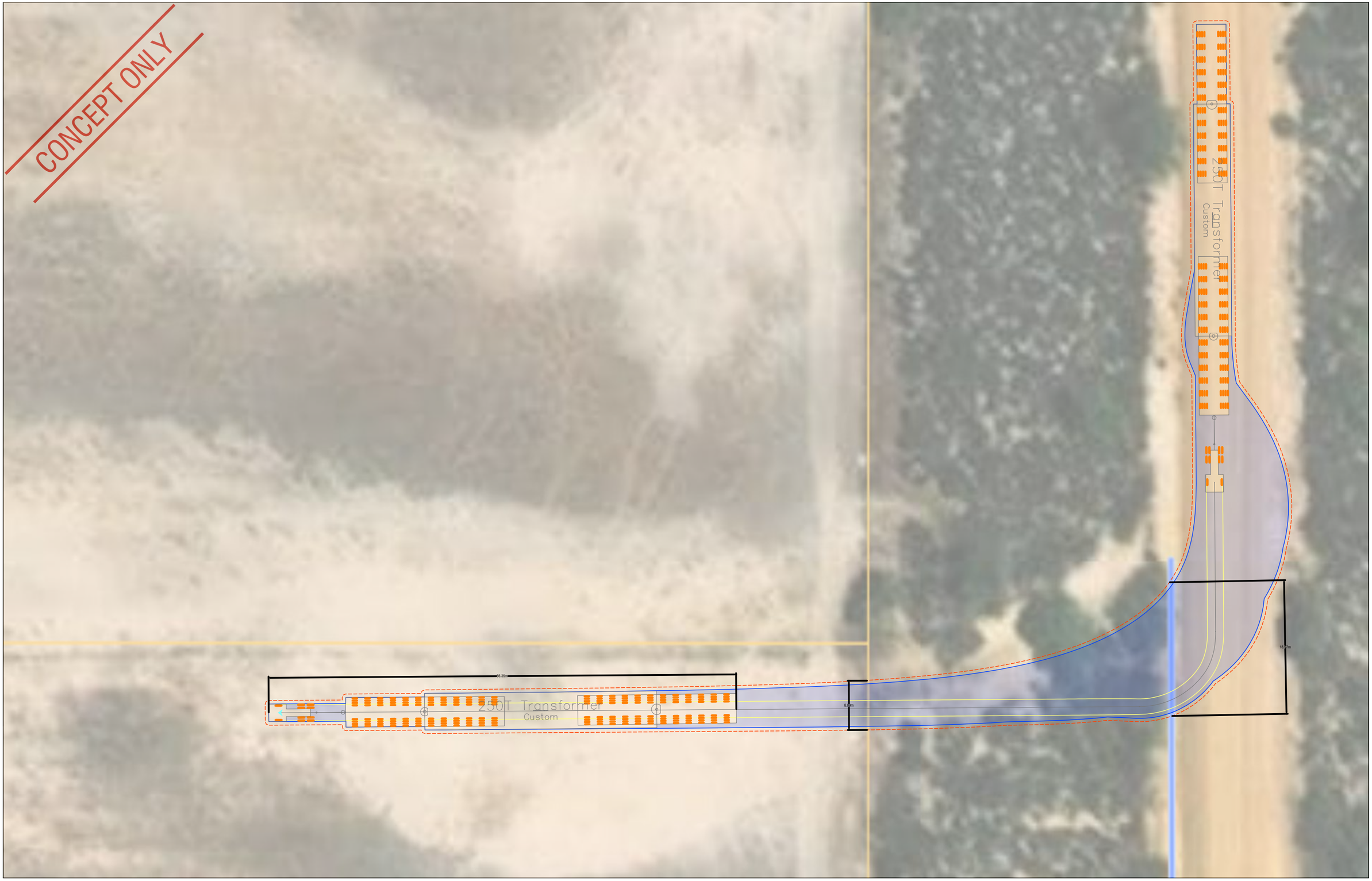
SCALE 1:750

Trina Solar Pty Ltd

Killawarra Solar and BESS

27.5m B-Double Design Vehicle

FIGURE SK04



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Project No:	675.072651
Date:	24/02/2025
Drawn by:	Charlie Seventekin
Certified by:	-
Sheet Size:	A3
Projection:	-

Trina Solar

Killawarra Solar and BESS

66m Transformer Transportation Combination

FIGURE SK-05

Appendix F SIDRA Results

Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project

Transport Impact Assessment

Trina Solar

SLR Project No.: 675.072651.00007

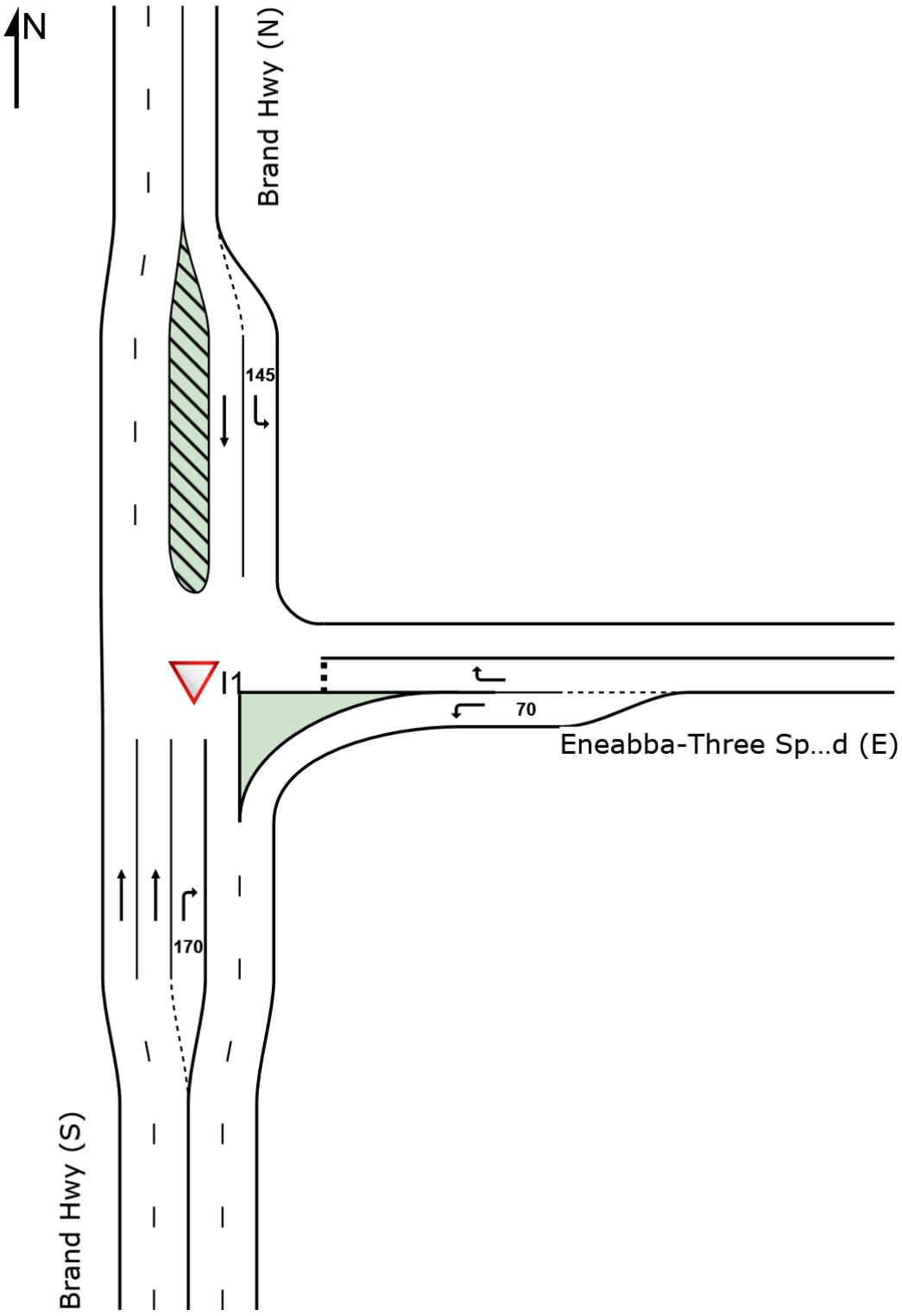
1 April 2025

SITE LAYOUT

Site: I1 [I1-Brand Hwy/Eneabba-Three Springs Rd EX-AM (Site Folder: Existing Conditions 2024)]

Brand Hwy/Eneabba-Three Springs Rd
Site Category: Existing Design
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

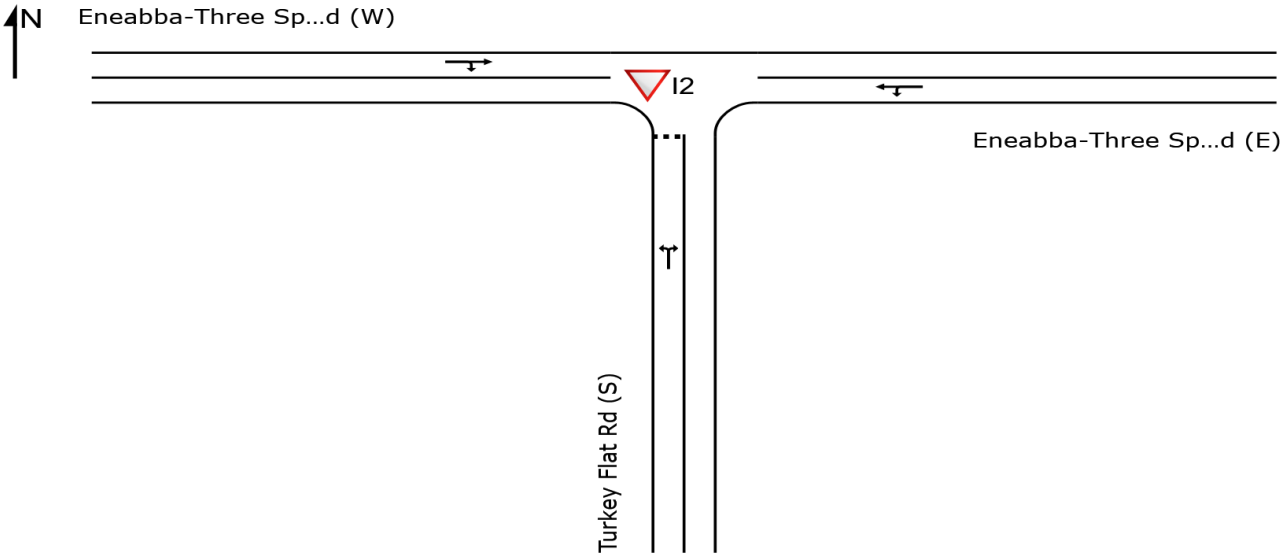


SITE LAYOUT

Site: I2 [I2-Eneabba-Three Springs Rd/Turkey Flat Rd EX-AM (Site Folder: Existing Conditions 2024)]

Eneabba-Three Springs Rd/Turkey Flat Rd
Site Category: Existing Design
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



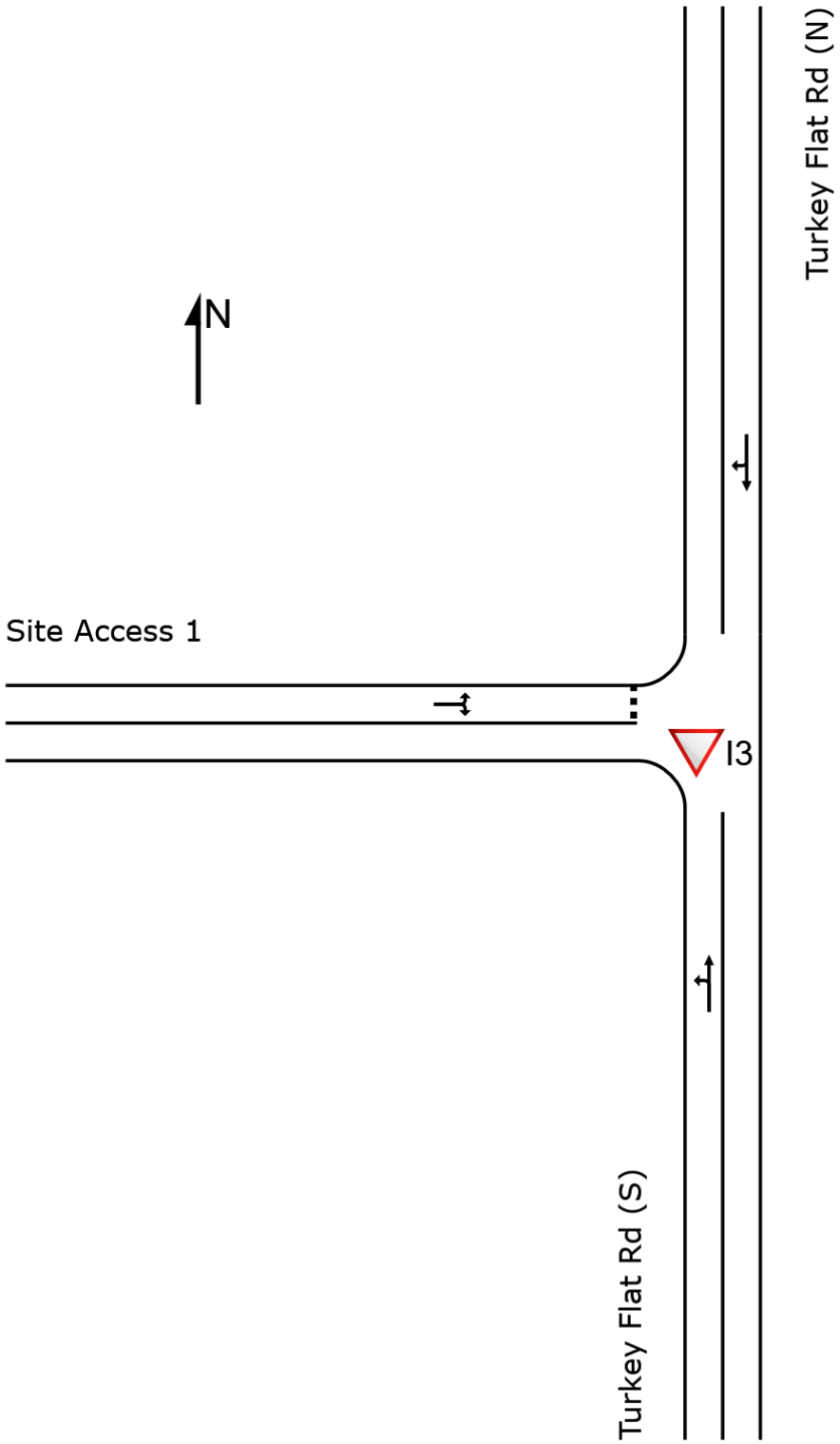
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SITE LAYOUT

Site: I3 [I3-Turkey Flat Rd/Site Access 1 EX-AM (Site Folder: Existing Conditions 2024)]

Turkey Flat Rd/Site Access 1
Site Category: Existing Design
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

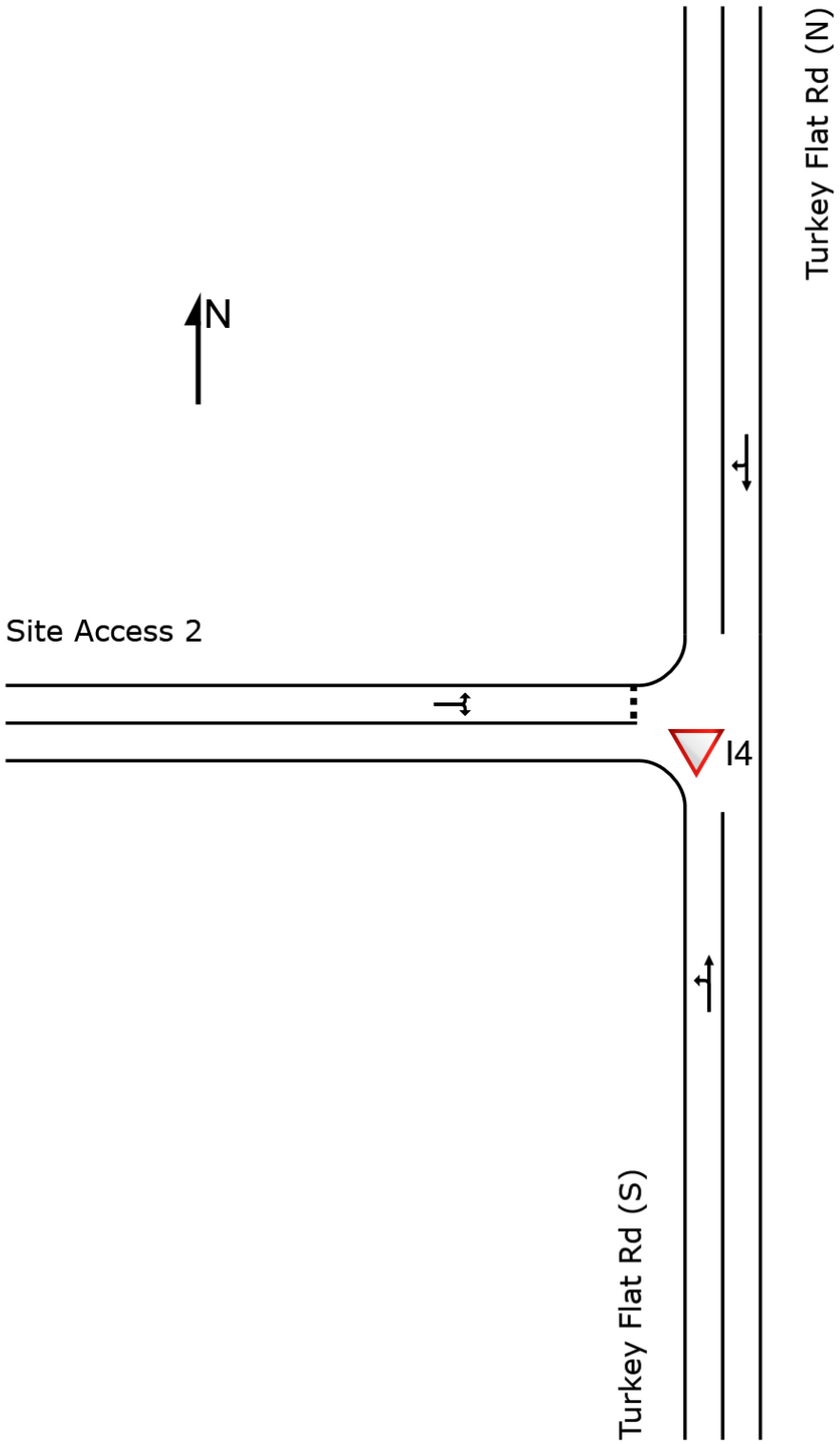


SITE LAYOUT

Site: I4 [I4-Turkey Flat Rd/Site Access 2 EX-AM (Site Folder: Existing Conditions 2024)]

Turkey Flat Rd/Site Access 2
Site Category: Existing Design
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: I1 [I1-Brand Hwy/Eneabba-Three Springs Rd EX-AM (Site Folder: Existing Conditions 2024)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Brand Hwy/Eneabba-Three Springs Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Brand Hwy (S)															
2	T1	All MCs	100	14.7	100	14.7	0.028	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
3	R2	All MCs	6	50.0	6	50.0	0.007	11.1	LOS B	0.0	0.3	0.36	0.62	0.36	54.0
Approach			106	16.8	106	16.8	0.028	0.7	NA	0.0	0.3	0.02	0.04	0.02	103.6
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	4	50.0	4	50.0	0.003	8.3	LOS A	0.0	0.0	0.00	0.58	0.00	52.2
6	R2	All MCs	6	50.0	6	50.0	0.015	12.9	LOS B	0.1	0.5	0.49	0.68	0.49	53.3
Approach			11	50.0	11	50.0	0.015	11.1	LOS B	0.1	0.5	0.29	0.64	0.29	52.8
North: Brand Hwy (N)															
7	L2	All MCs	6	50.0	6	50.0	0.005	9.7	LOS A	0.0	0.0	0.00	0.68	0.00	62.3
8	T1	All MCs	201	20.9	201	20.9	0.117	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach			207	21.8	207	21.8	0.117	0.3	NA	0.0	0.0	0.00	0.02	0.00	107.5
All Vehicles			324	21.1	324	21.1	0.117	0.8	NA	0.1	0.5	0.02	0.05	0.02	102.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I1 [I1-Brand Hwy/Eneabba-Three Springs Rd EX-PM (Site Folder: Existing Conditions 2024)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Brand Hwy/Eneabba-Three Springs Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Brand Hwy (S)															
2	T1	All MCs	136	18.6	136	18.6	0.039	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
3	R2	All MCs	4	50.0	4	50.0	0.004	10.6	LOS B	0.0	0.2	0.29	0.61	0.29	54.2
Approach			140	19.5	140	19.5	0.039	0.3	NA	0.0	0.2	0.01	0.02	0.01	106.7
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	2	50.0	2	50.0	0.002	8.3	LOS A	0.0	0.0	0.00	0.58	0.00	52.2
6	R2	All MCs	4	50.0	4	50.0	0.010	12.1	LOS B	0.0	0.3	0.46	0.65	0.46	53.9
Approach			6	50.0	6	50.0	0.010	10.8	LOS B	0.0	0.3	0.31	0.63	0.31	53.3
North: Brand Hwy (N)															
7	L2	All MCs	6	50.0	6	50.0	0.005	9.7	LOS A	0.0	0.0	0.00	0.68	0.00	62.3
8	T1	All MCs	133	23.8	133	23.8	0.079	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach			139	25.0	139	25.0	0.079	0.4	NA	0.0	0.0	0.00	0.03	0.00	106.3
All Vehicles			285	22.9	285	22.9	0.079	0.6	NA	0.0	0.3	0.01	0.04	0.01	104.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I2 [I2-Eneabba-Three Springs Rd/Turkey Flat Rd EX-AM (Site Folder: Existing Conditions 2024)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Eneabba-Three Springs Rd/Turkey Flat Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	2	50.0	2	50.0	0.004	9.7	LOS A	0.0	0.1	0.03	0.67	0.03	62.4
3	R2	All MCs	2	50.0	2	50.0	0.004	9.3	LOS A	0.0	0.1	0.03	0.67	0.03	61.4
Approach			4	50.0	4	50.0	0.004	9.5	LOS A	0.0	0.1	0.03	0.67	0.03	61.9
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	8	50.0	8	50.0	0.008	9.7	LOS A	0.0	0.0	0.00	0.55	0.00	64.1
5	T1	All MCs	2	50.0	2	50.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.55	0.00	91.9
Approach			11	50.0	11	50.0	0.008	7.7	NA	0.0	0.0	0.00	0.55	0.00	68.2
West: Eneabba-Three Springs Rd (W)															
11	T1	All MCs	11	50.0	11	50.0	0.009	0.0	LOS A	0.0	0.1	0.02	0.12	0.02	105.5
12	R2	All MCs	2	50.0	2	50.0	0.009	9.3	LOS A	0.0	0.1	0.02	0.12	0.02	69.1
Approach			13	50.0	13	50.0	0.009	1.5	NA	0.0	0.1	0.02	0.12	0.02	97.0
All Vehicles			27	50.0	27	50.0	0.009	5.1	NA	0.0	0.1	0.02	0.37	0.02	77.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I2 [I2-Eneabba-Three Springs Rd/Turkey Flat Rd EX-PM (Site Folder: Existing Conditions 2024)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Eneabba-Three Springs Rd/Turkey Flat Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	2	50.0	2	50.0	0.004	9.7	LOS A	0.0	0.1	0.05	0.66	0.05	62.3
3	R2	All MCs	2	50.0	2	50.0	0.004	9.3	LOS A	0.0	0.1	0.05	0.66	0.05	61.4
Approach			4	50.0	4	50.0	0.004	9.5	LOS A	0.0	0.1	0.05	0.66	0.05	61.8
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	2	50.0	2	50.0	0.004	9.7	LOS A	0.0	0.0	0.00	0.23	0.00	68.6
5	T1	All MCs	4	50.0	4	50.0	0.004	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	101.6
Approach			6	50.0	6	50.0	0.004	3.2	NA	0.0	0.0	0.00	0.23	0.00	87.6
West: Eneabba-Three Springs Rd (W)															
11	T1	All MCs	8	50.0	8	50.0	0.007	0.0	LOS A	0.0	0.1	0.02	0.14	0.02	104.8
12	R2	All MCs	2	50.0	2	50.0	0.007	9.3	LOS A	0.0	0.1	0.02	0.14	0.02	68.8
Approach			11	50.0	11	50.0	0.007	1.9	NA	0.0	0.1	0.02	0.14	0.02	94.8
All Vehicles			21	50.0	21	50.0	0.007	3.8	NA	0.0	0.1	0.02	0.27	0.02	83.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I3 [I3-Turkey Flat Rd/Site Access 1 EX-AM (Site Folder: Existing Conditions 2024)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 1
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.003	8.2	LOS A	0.0	0.0	0.00	0.14	0.00	58.6
2	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	101.6
Approach			5	40.0	5	40.0	0.003	1.6	NA	0.0	0.0	0.00	0.14	0.00	88.6
North: Turkey Flat Rd (N)															
8	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.01	0.14	0.01	101.9
9	R2	All MCs	1	0.0	1	0.0	0.003	7.7	LOS A	0.0	0.0	0.01	0.14	0.01	33.2
Approach			5	40.0	5	40.0	0.003	1.5	NA	0.0	0.0	0.01	0.14	0.01	72.1
West: Site Access 1															
10	L2	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.04	0.07	0.04	32.0
12	R2	All MCs	1	0.0	1	0.0	0.001	0.6	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
Approach			2	0.0	2	0.0	0.001	0.3	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
All Vehicles			13	33.3	13	33.3	0.003	1.4	NA	0.0	0.0	0.01	0.13	0.01	63.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I3 [I3-Turkey Flat Rd/Site Access 1 EX-PM (Site Folder: Existing Conditions 2024)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 1
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.003	8.2	LOS A	0.0	0.0	0.00	0.14	0.00	58.6
2	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	101.6
Approach			5	40.0	5	40.0	0.003	1.6	NA	0.0	0.0	0.00	0.14	0.00	88.6
North: Turkey Flat Rd (N)															
8	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.01	0.14	0.01	101.9
9	R2	All MCs	1	0.0	1	0.0	0.003	7.7	LOS A	0.0	0.0	0.01	0.14	0.01	33.2
Approach			5	40.0	5	40.0	0.003	1.5	NA	0.0	0.0	0.01	0.14	0.01	72.1
West: Site Access 1															
10	L2	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.04	0.07	0.04	32.0
12	R2	All MCs	1	0.0	1	0.0	0.001	0.6	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
Approach			2	0.0	2	0.0	0.001	0.3	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
All Vehicles			13	33.3	13	33.3	0.003	1.4	NA	0.0	0.0	0.01	0.13	0.01	63.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I4 [I4-Turkey Flat Rd/Site Access 2 EX-AM (Site Folder: Existing Conditions 2024)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 2
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.003	8.2	LOS A	0.0	0.0	0.00	0.14	0.00	58.6
2	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	101.6
Approach			5	40.0	5	40.0	0.003	1.6	NA	0.0	0.0	0.00	0.14	0.00	88.6
North: Turkey Flat Rd (N)															
8	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.01	0.14	0.01	101.9
9	R2	All MCs	1	0.0	1	0.0	0.003	7.7	LOS A	0.0	0.0	0.01	0.14	0.01	33.2
Approach			5	40.0	5	40.0	0.003	1.5	NA	0.0	0.0	0.01	0.14	0.01	72.1
West: Site Access 2															
10	L2	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.04	0.07	0.04	32.0
12	R2	All MCs	1	0.0	1	0.0	0.001	0.6	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
Approach			2	0.0	2	0.0	0.001	0.3	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
All Vehicles			13	33.3	13	33.3	0.003	1.4	NA	0.0	0.0	0.01	0.13	0.01	63.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I4 [I4-Turkey Flat Rd/Site Access 2 EX-PM (Site Folder: Existing Conditions 2024)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 2
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.003	8.2	LOS A	0.0	0.0	0.00	0.14	0.00	58.6
2	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	101.6
Approach			5	40.0	5	40.0	0.003	1.6	NA	0.0	0.0	0.00	0.14	0.00	88.6
North: Turkey Flat Rd (N)															
8	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.01	0.14	0.01	101.9
9	R2	All MCs	1	0.0	1	0.0	0.003	7.7	LOS A	0.0	0.0	0.01	0.14	0.01	33.2
Approach			5	40.0	5	40.0	0.003	1.5	NA	0.0	0.0	0.01	0.14	0.01	72.1
West: Site Access 2															
10	L2	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.04	0.07	0.04	32.0
12	R2	All MCs	1	0.0	1	0.0	0.001	0.6	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
Approach			2	0.0	2	0.0	0.001	0.3	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
All Vehicles			13	33.3	13	33.3	0.003	1.4	NA	0.0	0.0	0.01	0.13	0.01	63.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I1 [I1-Brand Hwy/Eneabba-Three Springs Rd BG-AM (Site Folder: BG GROWTH 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Brand Hwy/Eneabba-Three Springs Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Brand Hwy (S)															
2	T1	All MCs	106	14.9	106	14.9	0.030	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
3	R2	All MCs	6	50.0	6	50.0	0.008	11.2	LOS B	0.0	0.3	0.37	0.63	0.37	53.9
Approach			113	16.8	113	16.8	0.030	0.6	NA	0.0	0.3	0.02	0.04	0.02	103.9
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	4	50.0	4	50.0	0.003	8.3	LOS A	0.0	0.0	0.00	0.58	0.00	52.2
6	R2	All MCs	6	50.0	6	50.0	0.016	13.3	LOS B	0.1	0.5	0.50	0.69	0.50	52.9
Approach			11	50.0	11	50.0	0.016	11.3	LOS B	0.1	0.5	0.30	0.65	0.30	52.7
North: Brand Hwy (N)															
7	L2	All MCs	6	50.0	6	50.0	0.005	9.7	LOS A	0.0	0.0	0.00	0.68	0.00	62.3
8	T1	All MCs	213	20.8	213	20.8	0.124	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach			219	21.6	219	21.6	0.124	0.3	NA	0.0	0.0	0.00	0.02	0.00	107.6
All Vehicles			342	20.9	342	20.9	0.124	0.7	NA	0.1	0.5	0.02	0.04	0.02	103.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I1 [I1-Brand Hwy/Eneabba-Three Springs Rd BG-PM (Site Folder: BG GROWTH 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Brand Hwy/Eneabba-Three Springs Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Brand Hwy (S)															
2	T1	All MCs	143	18.4	143	18.4	0.041	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
3	R2	All MCs	4	50.0	4	50.0	0.005	10.6	LOS B	0.0	0.2	0.30	0.61	0.30	54.2
Approach			147	19.3	147	19.3	0.041	0.3	NA	0.0	0.2	0.01	0.02	0.01	106.8
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	2	50.0	2	50.0	0.002	8.3	LOS A	0.0	0.0	0.00	0.58	0.00	52.2
6	R2	All MCs	4	50.0	4	50.0	0.010	12.4	LOS B	0.0	0.3	0.47	0.66	0.47	53.6
Approach			6	50.0	6	50.0	0.010	11.1	LOS B	0.0	0.3	0.31	0.63	0.31	53.2
North: Brand Hwy (N)															
7	L2	All MCs	6	50.0	6	50.0	0.005	9.7	LOS A	0.0	0.0	0.00	0.68	0.00	62.3
8	T1	All MCs	141	23.9	141	23.9	0.084	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach			147	25.0	147	25.0	0.084	0.4	NA	0.0	0.0	0.00	0.03	0.00	106.5
All Vehicles			301	22.7	301	22.7	0.084	0.6	NA	0.0	0.3	0.01	0.04	0.01	104.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I2 [I2-Eneabba-Three Springs Rd/Turkey Flat Rd BG-AM (Site Folder: BG GROWTH 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Eneabba-Three Springs Rd/Turkey Flat Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	2	50.0	2	50.0	0.004	9.7	LOS A	0.0	0.1	0.03	0.67	0.03	62.4
3	R2	All MCs	2	50.0	2	50.0	0.004	9.3	LOS A	0.0	0.1	0.03	0.67	0.03	61.4
Approach			4	50.0	4	50.0	0.004	9.5	LOS A	0.0	0.1	0.03	0.67	0.03	61.9
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	8	50.0	8	50.0	0.008	9.7	LOS A	0.0	0.0	0.00	0.55	0.00	64.1
5	T1	All MCs	2	50.0	2	50.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.55	0.00	91.9
Approach			11	50.0	11	50.0	0.008	7.7	NA	0.0	0.0	0.00	0.55	0.00	68.2
West: Eneabba-Three Springs Rd (W)															
11	T1	All MCs	11	50.0	11	50.0	0.009	0.0	LOS A	0.0	0.1	0.02	0.12	0.02	105.5
12	R2	All MCs	2	50.0	2	50.0	0.009	9.3	LOS A	0.0	0.1	0.02	0.12	0.02	69.1
Approach			13	50.0	13	50.0	0.009	1.5	NA	0.0	0.1	0.02	0.12	0.02	97.0
All Vehicles			27	50.0	27	50.0	0.009	5.1	NA	0.0	0.1	0.02	0.37	0.02	77.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I2 [I2-Eneabba-Three Springs Rd/Turkey Flat Rd BG-PM (Site Folder: BG GROWTH 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Eneabba-Three Springs Rd/Turkey Flat Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	2	50.0	2	50.0	0.004	9.7	LOS A	0.0	0.1	0.05	0.66	0.05	62.3
3	R2	All MCs	2	50.0	2	50.0	0.004	9.3	LOS A	0.0	0.1	0.05	0.66	0.05	61.4
Approach			4	50.0	4	50.0	0.004	9.5	LOS A	0.0	0.1	0.05	0.66	0.05	61.8
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	2	50.0	2	50.0	0.004	9.7	LOS A	0.0	0.0	0.00	0.23	0.00	68.6
5	T1	All MCs	4	50.0	4	50.0	0.004	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	101.6
Approach			6	50.0	6	50.0	0.004	3.2	NA	0.0	0.0	0.00	0.23	0.00	87.6
West: Eneabba-Three Springs Rd (W)															
11	T1	All MCs	8	50.0	8	50.0	0.007	0.0	LOS A	0.0	0.1	0.02	0.14	0.02	104.8
12	R2	All MCs	2	50.0	2	50.0	0.007	9.3	LOS A	0.0	0.1	0.02	0.14	0.02	68.8
Approach			11	50.0	11	50.0	0.007	1.9	NA	0.0	0.1	0.02	0.14	0.02	94.8
All Vehicles			21	50.0	21	50.0	0.007	3.8	NA	0.0	0.1	0.02	0.27	0.02	83.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I3 [I3-Turkey Flat Rd/Site Access 1 BG-AM (Site Folder: BG GROWTH 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 1
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.003	8.2	LOS A	0.0	0.0	0.00	0.14	0.00	58.6
2	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	101.6
Approach			5	40.0	5	40.0	0.003	1.6	NA	0.0	0.0	0.00	0.14	0.00	88.6
North: Turkey Flat Rd (N)															
8	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.01	0.14	0.01	101.9
9	R2	All MCs	1	0.0	1	0.0	0.003	7.7	LOS A	0.0	0.0	0.01	0.14	0.01	33.2
Approach			5	40.0	5	40.0	0.003	1.5	NA	0.0	0.0	0.01	0.14	0.01	72.1
West: Site Access 1															
10	L2	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.04	0.07	0.04	32.0
12	R2	All MCs	1	0.0	1	0.0	0.001	0.6	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
Approach			2	0.0	2	0.0	0.001	0.3	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
All Vehicles			13	33.3	13	33.3	0.003	1.4	NA	0.0	0.0	0.01	0.13	0.01	63.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I3 [I3-Turkey Flat Rd/Site Access 1 BG-PM (Site Folder: BG GROWTH 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 1
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.003	8.2	LOS A	0.0	0.0	0.00	0.14	0.00	58.6
2	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	101.6
Approach			5	40.0	5	40.0	0.003	1.6	NA	0.0	0.0	0.00	0.14	0.00	88.6
North: Turkey Flat Rd (N)															
8	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.01	0.14	0.01	101.9
9	R2	All MCs	1	0.0	1	0.0	0.003	7.7	LOS A	0.0	0.0	0.01	0.14	0.01	33.2
Approach			5	40.0	5	40.0	0.003	1.5	NA	0.0	0.0	0.01	0.14	0.01	72.1
West: Site Access 1															
10	L2	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.04	0.07	0.04	32.0
12	R2	All MCs	1	0.0	1	0.0	0.001	0.6	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
Approach			2	0.0	2	0.0	0.001	0.3	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
All Vehicles			13	33.3	13	33.3	0.003	1.4	NA	0.0	0.0	0.01	0.13	0.01	63.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I4 [I4-Turkey Flat Rd/Site Access 2 BG-AM (Site Folder: BG GROWTH 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 2
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.003	8.2	LOS A	0.0	0.0	0.00	0.14	0.00	58.6
2	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	101.6
Approach			5	40.0	5	40.0	0.003	1.6	NA	0.0	0.0	0.00	0.14	0.00	88.6
North: Turkey Flat Rd (N)															
8	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.01	0.14	0.01	101.9
9	R2	All MCs	1	0.0	1	0.0	0.003	7.7	LOS A	0.0	0.0	0.01	0.14	0.01	33.2
Approach			5	40.0	5	40.0	0.003	1.5	NA	0.0	0.0	0.01	0.14	0.01	72.1
West: Site Access 2															
10	L2	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.04	0.07	0.04	32.0
12	R2	All MCs	1	0.0	1	0.0	0.001	0.6	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
Approach			2	0.0	2	0.0	0.001	0.3	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
All Vehicles			13	33.3	13	33.3	0.003	1.4	NA	0.0	0.0	0.01	0.13	0.01	63.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I4 [I4-Turkey Flat Rd/Site Access 2 BG-PM (Site Folder: BG GROWTH 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 2
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.003	8.2	LOS A	0.0	0.0	0.00	0.14	0.00	58.6
2	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	101.6
Approach			5	40.0	5	40.0	0.003	1.6	NA	0.0	0.0	0.00	0.14	0.00	88.6
North: Turkey Flat Rd (N)															
8	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.01	0.14	0.01	101.9
9	R2	All MCs	1	0.0	1	0.0	0.003	7.7	LOS A	0.0	0.0	0.01	0.14	0.01	33.2
Approach			5	40.0	5	40.0	0.003	1.5	NA	0.0	0.0	0.01	0.14	0.01	72.1
West: Site Access 2															
10	L2	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.04	0.07	0.04	32.0
12	R2	All MCs	1	0.0	1	0.0	0.001	0.6	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
Approach			2	0.0	2	0.0	0.001	0.3	LOS A	0.0	0.0	0.04	0.07	0.04	31.9
All Vehicles			13	33.3	13	33.3	0.003	1.4	NA	0.0	0.0	0.01	0.13	0.01	63.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I1 [I1-Brand Hwy/Eneabba-Three Springs Rd BG+CON-AM (Site Folder: BG GROWTH+CONS 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Brand Hwy/Eneabba-Three Springs Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Brand Hwy (S)															
2	T1	All MCs	106	14.9	106	14.9	0.030	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
3	R2	All MCs	11	50.0	11	50.0	0.013	11.3	LOS B	0.0	0.5	0.38	0.64	0.38	53.8
Approach			117	18.0	117	18.0	0.030	1.0	NA	0.0	0.5	0.03	0.06	0.03	100.5
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	4	50.0	4	50.0	0.003	8.3	LOS A	0.0	0.0	0.00	0.58	0.00	52.2
6	R2	All MCs	14	76.9	14	76.9	0.042	15.7	LOS C	0.1	1.6	0.54	0.76	0.54	48.9
Approach			18	70.6	18	70.6	0.042	14.0	LOS B	0.1	1.6	0.41	0.72	0.41	49.6
North: Brand Hwy (N)															
7	L2	All MCs	18	70.6	18	70.6	0.014	10.3	LOS B	0.0	0.0	0.00	0.68	0.00	59.3
8	T1	All MCs	213	20.8	213	20.8	0.124	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach			231	24.7	231	24.7	0.124	0.8	NA	0.0	0.0	0.00	0.05	0.00	103.1
All Vehicles			365	24.8	365	24.8	0.124	1.5	NA	0.1	1.6	0.03	0.09	0.03	97.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I1 [I1-Brand Hwy/Eneabba-Three Springs Rd BG+CON-PM (Site Folder: BG GROWTH+CONS 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Brand Hwy/Eneabba-Three Springs Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Brand Hwy (S)															
2	T1	All MCs	143	18.4	143	18.4	0.041	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
3	R2	All MCs	4	50.0	4	50.0	0.005	10.7	LOS B	0.0	0.2	0.31	0.61	0.31	54.2
Approach			147	19.3	147	19.3	0.041	0.3	NA	0.0	0.2	0.01	0.02	0.01	106.8
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	6	50.0	6	50.0	0.005	8.3	LOS A	0.0	0.0	0.00	0.58	0.00	52.2
6	R2	All MCs	16	73.3	16	73.3	0.037	12.5	LOS B	0.1	1.4	0.45	0.68	0.45	51.4
Approach			22	66.7	22	66.7	0.037	11.3	LOS B	0.1	1.4	0.32	0.65	0.32	51.6
North: Brand Hwy (N)															
7	L2	All MCs	141	23.9	141	23.9	0.089	8.9	LOS A	0.0	0.0	0.00	0.67	0.00	66.7
8	T1	All MCs	14	76.9	14	76.9	0.011	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach			155	28.6	155	28.6	0.089	8.1	NA	0.0	0.0	0.00	0.61	0.00	69.1
All Vehicles			324	26.9	324	26.9	0.089	4.8	NA	0.1	1.4	0.03	0.34	0.03	80.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I2 [I2-Eneabba-Three Springs Rd/Turkey Flat Rd BG +CON-AM (Site Folder: BG GROWTH+CONS 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Eneabba-Three Springs Rd/Turkey Flat Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	9	88.9	9	88.9	0.011	10.9	LOS B	0.0	0.5	0.06	0.65	0.06	56.7
3	R2	All MCs	2	50.0	2	50.0	0.011	9.5	LOS A	0.0	0.5	0.06	0.65	0.06	61.3
Approach			12	81.8	12	81.8	0.011	10.6	LOS B	0.0	0.5	0.06	0.65	0.06	57.5
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	20	57.9	20	57.9	0.021	9.9	LOS A	0.0	0.0	0.00	0.48	0.00	64.0
5	T1	All MCs	8	50.0	8	50.0	0.021	0.0	LOS A	0.0	0.0	0.00	0.48	0.00	94.5
Approach			28	55.6	28	55.6	0.021	7.0	NA	0.0	0.0	0.00	0.48	0.00	70.8
West: Eneabba-Three Springs Rd (W)															
11	T1	All MCs	11	50.0	11	50.0	0.022	0.2	LOS A	0.1	1.0	0.13	0.42	0.13	98.1
12	R2	All MCs	17	75.0	17	75.0	0.022	10.2	LOS B	0.1	1.0	0.13	0.42	0.13	61.4
Approach			27	65.4	27	65.4	0.022	6.4	NA	0.1	1.0	0.13	0.42	0.13	71.7
All Vehicles			67	64.1	67	64.1	0.022	7.3	NA	0.1	1.0	0.06	0.48	0.06	68.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I2 [I2-Eneabba-Three Springs Rd/Turkey Flat Rd BG +CON-PM (Site Folder: BG GROWTH+CONS 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Eneabba-Three Springs Rd/Turkey Flat Rd
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	17	75.0	17	75.0	0.035	10.4	LOS B	0.1	1.4	0.05	0.67	0.05	58.7
3	R2	All MCs	20	57.9	20	57.9	0.035	9.6	LOS A	0.1	1.4	0.05	0.67	0.05	60.1
Approach			37	65.7	37	65.7	0.035	10.0	LOS A	0.1	1.4	0.05	0.67	0.05	59.5
East: Eneabba-Three Springs Rd (E)															
4	L2	All MCs	2	50.0	2	50.0	0.004	9.7	LOS A	0.0	0.0	0.00	0.23	0.00	68.6
5	T1	All MCs	4	50.0	4	50.0	0.004	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	101.6
Approach			6	50.0	6	50.0	0.004	3.2	NA	0.0	0.0	0.00	0.23	0.00	87.6
West: Eneabba-Three Springs Rd (W)															
11	T1	All MCs	8	50.0	8	50.0	0.014	0.0	LOS A	0.1	0.7	0.05	0.36	0.05	104.3
12	R2	All MCs	9	88.9	9	88.9	0.014	10.5	LOS B	0.1	0.7	0.05	0.36	0.05	61.3
Approach			18	70.6	18	70.6	0.014	5.6	NA	0.1	0.7	0.05	0.36	0.05	76.1
All Vehicles			61	65.5	61	65.5	0.035	8.0	NA	0.1	1.4	0.05	0.53	0.05	65.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I3 [I3-Turkey Flat Rd/Site Access 1 BG+CON-AM (Site Folder: BG GROWTH+CONS 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 1
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.012	8.2	LOS A	0.0	0.0	0.00	0.04	0.00	59.9
2	T1	All MCs	16	66.7	16	66.7	0.012	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	105.6
Approach			17	62.5	17	62.5	0.012	0.5	NA	0.0	0.0	0.00	0.04	0.00	100.8
North: Turkey Flat Rd (N)															
8	T1	All MCs	15	64.3	15	64.3	0.028	0.1	LOS A	0.1	1.3	0.09	0.41	0.09	95.8
9	R2	All MCs	22	66.7	22	66.7	0.028	9.9	LOS A	0.1	1.3	0.09	0.41	0.09	32.6
Approach			37	65.7	37	65.7	0.028	6.0	NA	0.1	1.3	0.09	0.41	0.09	44.3
West: Site Access 1															
10	L2	All MCs	4	100.0	4	100.0	0.005	0.1	LOS A	0.0	0.2	0.10	0.05	0.10	27.2
12	R2	All MCs	1	0.0	1	0.0	0.005	0.8	LOS A	0.0	0.2	0.10	0.05	0.10	30.5
Approach			5	80.0	5	80.0	0.005	0.3	LOS A	0.0	0.2	0.10	0.05	0.10	27.8
All Vehicles			59	66.1	59	66.1	0.028	3.9	NA	0.1	1.3	0.07	0.27	0.07	49.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I3 [I3-Turkey Flat Rd/Site Access 1 BG+CON-PM (Site Folder: BG GROWTH+CONS 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 1
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.011	8.2	LOS A	0.0	0.0	0.00	0.05	0.00	59.9
2	T1	All MCs	15	64.3	15	64.3	0.011	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	105.6
Approach			16	60.0	16	60.0	0.011	0.5	NA	0.0	0.0	0.00	0.05	0.00	100.5
North: Turkey Flat Rd (N)															
8	T1	All MCs	6	33.3	6	33.3	0.008	0.1	LOS A	0.0	0.3	0.08	0.28	0.08	93.6
9	R2	All MCs	4	100.0	4	100.0	0.008	10.9	LOS B	0.0	0.3	0.08	0.28	0.08	32.3
Approach			11	60.0	11	60.0	0.008	4.4	NA	0.0	0.3	0.08	0.28	0.08	53.2
West: Site Access 1															
10	L2	All MCs	22	66.7	22	66.7	0.019	0.1	LOS A	0.1	0.8	0.08	0.02	0.08	28.3
12	R2	All MCs	1	0.0	1	0.0	0.019	0.7	LOS A	0.1	0.8	0.08	0.02	0.08	30.6
Approach			23	63.6	23	63.6	0.019	0.1	LOS A	0.1	0.8	0.08	0.02	0.08	28.4
All Vehicles			49	61.7	49	61.7	0.019	1.2	NA	0.1	0.8	0.06	0.09	0.06	42.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I4 [I4-Turkey Flat Rd/Site Access 2 BG+CON-AM (Site Folder: BG GROWTH+CONS 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 2
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.003	8.2	LOS A	0.0	0.0	0.00	0.14	0.00	58.6
2	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	101.6
Approach			5	40.0	5	40.0	0.003	1.6	NA	0.0	0.0	0.00	0.14	0.00	88.6
North: Turkey Flat Rd (N)															
8	T1	All MCs	4	50.0	4	50.0	0.011	0.0	LOS A	0.0	0.5	0.04	0.49	0.04	96.0
9	R2	All MCs	11	70.0	11	70.0	0.011	9.9	LOS A	0.0	0.5	0.04	0.49	0.04	32.6
Approach			15	64.3	15	64.3	0.011	7.1	NA	0.0	0.5	0.04	0.49	0.04	40.2
West: Site Access 2															
10	L2	All MCs	2	100.0	2	100.0	0.003	0.0	LOS A	0.0	0.1	0.04	0.05	0.04	27.3
12	R2	All MCs	1	0.0	1	0.0	0.003	0.6	LOS A	0.0	0.1	0.04	0.05	0.04	30.6
Approach			3	66.7	3	66.7	0.003	0.2	LOS A	0.0	0.1	0.04	0.05	0.04	28.3
All Vehicles			23	59.1	23	59.1	0.011	4.9	NA	0.0	0.5	0.03	0.35	0.03	43.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I4 [I4-Turkey Flat Rd/Site Access 2 BG+CON-PM (Site Folder: BG GROWTH+CONS 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Turkey Flat Rd/Site Access 2
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Turkey Flat Rd (S)															
1	L2	All MCs	1	0.0	1	0.0	0.003	8.2	LOS A	0.0	0.0	0.00	0.14	0.00	58.6
2	T1	All MCs	4	50.0	4	50.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	101.6
Approach			5	40.0	5	40.0	0.003	1.6	NA	0.0	0.0	0.00	0.14	0.00	88.6
North: Turkey Flat Rd (N)															
8	T1	All MCs	4	50.0	4	50.0	0.005	0.0	LOS A	0.0	0.2	0.03	0.23	0.03	94.1
9	R2	All MCs	2	100.0	2	100.0	0.005	10.8	LOS B	0.0	0.2	0.03	0.23	0.03	32.4
Approach			6	66.7	6	66.7	0.005	3.6	NA	0.0	0.2	0.03	0.23	0.03	57.5
West: Site Access 2															
10	L2	All MCs	11	70.0	11	70.0	0.010	0.0	LOS A	0.0	0.4	0.04	0.02	0.04	28.2
12	R2	All MCs	1	0.0	1	0.0	0.010	0.6	LOS A	0.0	0.4	0.04	0.02	0.04	30.6
Approach			12	63.6	12	63.6	0.010	0.1	LOS A	0.0	0.4	0.04	0.02	0.04	28.4
All Vehicles			23	59.1	23	59.1	0.010	1.4	NA	0.0	0.4	0.03	0.10	0.03	40.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Appendix G Drivers' Code of Conduct

Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project

Transport Impact Assessment

Trina Solar

SLR Project No.: 675.072651.00007

1 April 2025

DRIVERS CODE OF CONDUCT

Safe Driving Policy for Killawarra Solar and Battery Energy Storage System (BESS), Turkey Flat Road WA.

1. Objectives

- To minimise the impact of earthworks and construction on the local and state road network:
  - Minimise conflict with other road users.
  - Minimise road traffic noise.
  - Ensure truck drivers use specified routes.

2. Code of Conduct

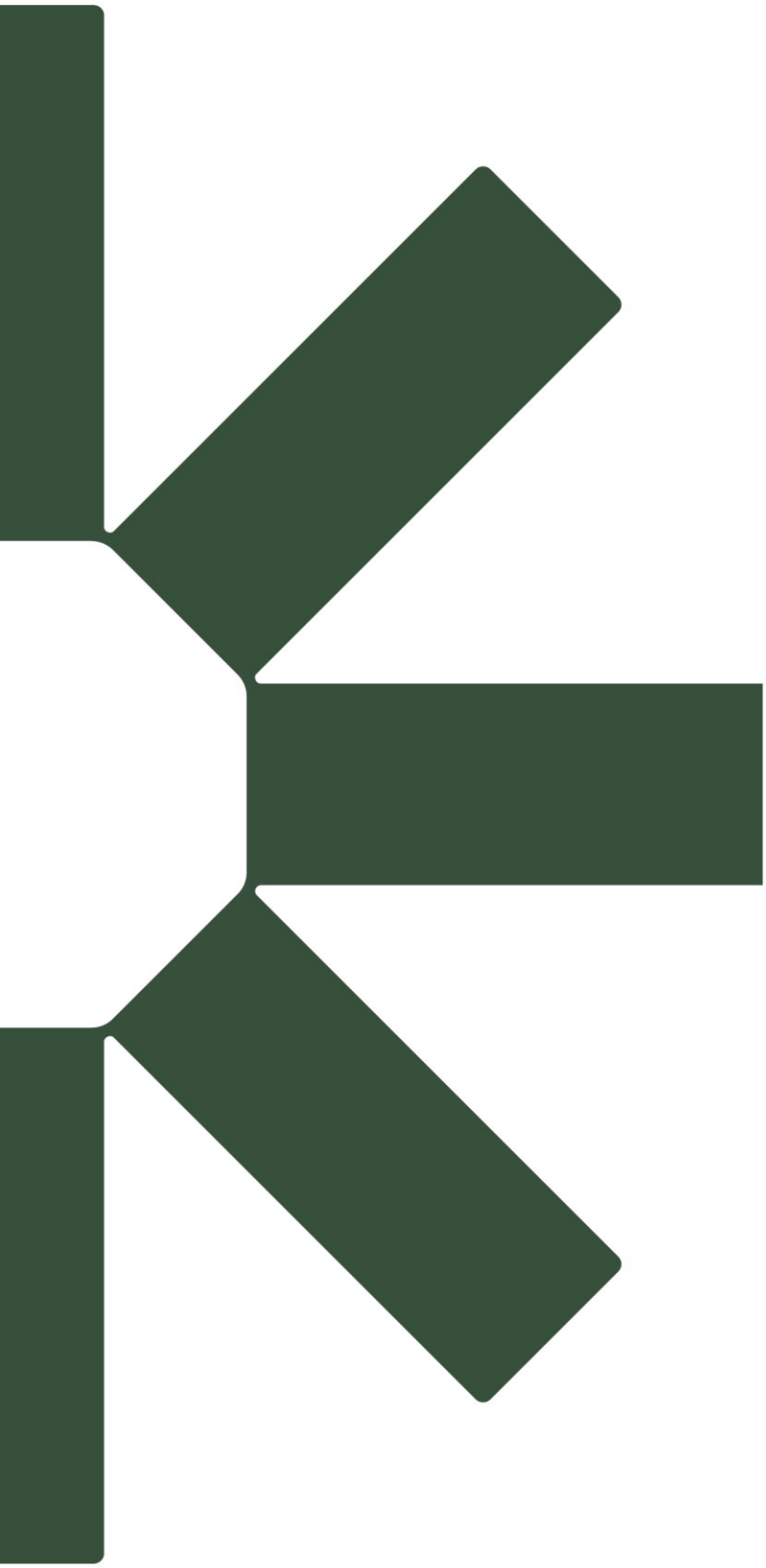
All vehicle operators accessing the site must:

- Take reasonable care for his or her own personal health and safety.
- Not adversely, by way of actions or otherwise, impact on the health and safety of other persons.
- Notify their employer if they are not fit for duty prior to commencing their shift.
- Obey all applicable road rules and laws at all times.
- In the event an emergency vehicle is behind your vehicle, pull over and allow the emergency vehicle to pass immediately.
- Obey the applicable driving hours per legislation and take all reasonable steps to manage your fatigue and not drive with high drowsiness.
- Obey all on-site signposted speed limits and comply with directions of traffic control supervisors in relation to movements in and around temporary or fixed work areas.
- Ensure all loads are safely restrained, as necessary.
- If available and required, drive over cattle grids that are located at the site's access to vibrate off any loose material attached to construction vehicles.
- Operate your vehicles in a safe and professional manner, with consideration for all other road users.
- Hold a current Australian State or Territory issued driver's licence.
- Notify your employer or operator immediately should the status or conditions of their driver's licence change in any way.
- Comply with other applicable workplace policies, including a zero tolerance of driving while under the influence of alcohol and/or illicit drugs.
- Not use mobile phones when driving a vehicle or operating equipment. If the use of a mobile device is required, the driver shall pull over in a safe and legal location before using any mobile device.
- Advise management of any situations in which you know or think may present a threat to workplace health and safety.

- Drive according to prevailing conditions (such as during inclement weather) and reduce speed, if necessary.
- Have necessary identification documentation at hand and ready to present to security staff on entry and departure from the site, as necessary, to avoid unnecessary delays to other vehicles.

3. Crash or Incident Procedure

- Stop your vehicle as close to it as possible to the scene, making sure you are not hindering traffic.
- Ensure your safety first, then help injured people and seek assistance immediately if required.
    - Ensure the following information is noted:
    - Details of the other vehicles and registration numbers.
    - Names and addresses of the other vehicle drivers.
    - Names and addresses of witnesses.
    - Insurers details.
- Give the following information to the involved parties:
    - Name, address, and company details.
- If the damaged vehicle is not occupied, provide a note with your contact details for the owner to
- contact the company.
- Ensure that the Police are contacted should the following circumstances occur:
    - If there is a disagreement over the cause of the crash.
    - If there are injuries.
    - If you damage property other than your own.
- As soon as reasonably practical, report all details gathered to your manager.



Making Sustainability Happen

Appendix F – Visual Impact Assessment

Visual Impact Assessment

Killawarra Solar Farm, Battery Energy Storage System (BESS) & Substation Project

Trina Solar

1 Farrer Place, Sydney NSW 2000

Prepared by:

SLR Consulting Australia

Level 1, 500 Hay Street, Subiaco WA 6008,
Australia

SLR Project No.: 675.072651.00001

11 April 2025

Revision: 0.2

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
0.1	4 April 2025	MD, EH	FB	GA
0.2	11 April 2025	EH	FB	GA

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Trina Solar (Australia) Pty Ltd (Trina Solar). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

SLR Consulting, was commissioned by Trina Solar to conduct a Visual Impact Assessment (VIA) for nine sensitive receptors around the proposed Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project (the Project). The Project is located 24 km southwest of the town of Three Springs and wholly within the Yamatiji Nation Native Title Determination Area.

The scope of work involved the characterisation of the existing landscape and the assessment of potential visual amenity and landscape impacts of the Project in relation to existing and potential future impacts.

A site visit was conducted to capture high-resolution photography from valued places and representative Landscape Character Units (LCUs). Photographs captured in January 2025 were used to confirm LCU mapping, as well as providing the basis for photomontage analysis, using a scaled 3D model of the Project.

Potential visual impacts to three LCUs and nine viewpoints were assessed. These were taken through to photomontage analysis to describe the existing landscape and predicted landscape.

As demonstrated in the assessment, implementation of the Project is predicted to result in no visual impacts to eight of the nine viewpoints, with one viewpoint assessed as having moderate impacts. Overall, implementation of the Project was predicted to have low visual impact as there was little visibility due to the screening effects of landforms and vegetation surrounding the Project and thus negligible change to visual amenity and landscape character. The Project was considered to have met the Visual Management Objectives (VMOs) due to the following:

- The Project does not result in a dominant change in view for moderate to high sensitivity viewpoints that are located >1 km from the Project.
- The Project does not result in the removal of valued characteristics, nor does it result in significant alteration or disruption to views of these valued characteristics.

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Appendix A Viewpoint Assessment: No Visibility

1.0 Introduction

Trina Solar Project Development (Trina Solar) is proposing to construct the Killawarra Solar, Battery Energy Storage System (BESS) & Substation Project (the Project).

The Project is located within the Shire of Three Springs in Western Australia (WA), approximately 24 km southwest of the town of Three Springs and wholly within the Yamatiji Nation Native Title Determination Area.

The Project will consist of the following electricity generation and storage equipment:

- Ground-mounted PV solar panel array with a peak generation capacity of 420MW (at 25ºC ambient)
- 80 x 685W solar inverter stations dispersed around the PV solar panel array
- BESS with 400MW / 16,000MWh storage capacity (at 25ºC ambient)
- High-voltage substation for connection of the hybrid PV solar and BESS facility to the 330kV transmission line passing through the proposed Project Area via a 60m long transmission line.

The proposed development area covers a total of 608 ha and is located within the 'Rural Zone' under the Shire of Three Springs Local Planning Scheme (LPS).

The Visual Impact Assessment has been prepared for the proposed Project Area (Figure 1) and includes assessment for nine (9) viewpoints in the Study Area (Figure 2).

1.1 Objectives

1.1.1 Visual Impact Assessment Objectives

The objectives of this VIA are to:

- Describe the existing visual landscape character.
- Describe the proposed development.
- Determine if the proposed Project is likely to have a visual impact at the selected viewpoints.
- Develop visual management measures.

1.1.2 Visual Management Objectives

The Western Australian Planning Commission's (WAPC) Visual Landscape Planning in Western Australia: A manual for evaluation, assessment, siting, and design (2007) adopts three broad Visual Management Objectives (VMOs):

- Best practice siting and design
- Protection and enhancement
- Restoration of degraded character or enhancement opportunities.

New South Wales Department of Planning and Environment (2016) define visibility distance zones as they relate to view distance and relative visual magnitude, describing view distances of 1 km as the far foreground with the relative size of the

development decreasing in apparent size with view distance. Based on this the following project-specific VMOs have been adopted for the Project:

- The Project should not result in a dominant change in view for moderate to high sensitivity viewpoints that are located > 1 km from the Project Area.
- Minimise the impact of the Project on 'valued characteristics'.

1.2 Legislative and Policy Framework

Legislative instruments exist at both Federal and State levels that directly or indirectly support the protection of landscapes and their associated visual amenity. These are outlined in Table 1.

1.3 Assessment Guidelines and Standards

This report was prepared with reference to the following guidelines and standards:

- Environmental Protection Authority 2023, Environmental Factor Guideline – Social Surroundings (EPA 2023a)
- Environmental Protection Authority 2018, Environmental Factor Guideline – Landforms (EPA 2018)
- Environmental Protection Authority 2023, Statement of Environmental Principles, Factors and Objectives (EPA 2023b)
- Western Australian Planning Commission 2007, Visual Landscape Planning in Western Australia: A manual for evaluation, assessment, siting, and design (WAPC 2007)
- Landscape Institute 2013, - Guidelines for Landscape and Visual Impact Assessment (GLVIA). Third edition. (Landscape Institute 2013).

Table 1: Legislative and Policy Framework and Relevance to the Project

Applicable Legislation	Relevance	Consideration Under this Assessment
Federal Law		
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Under Section 528 of the EPBC Act, the term 'environment' is defined as: a. Ecosystems and their constituent parts, including people and communities b. Natural and physical resources c. The qualities and characteristics of locations, places, and areas d. Heritage values of places e. The social, economic, and cultural aspects of a thing mentioned in (a), (b), (c) or (d). While the Project has the potential to affect all aspects of the 'Environment' as defined under the EPBC Act, impacts to (c) and (d) are directly related to landscape and visual amenity values.	This assessment has been prepared using a methodology that assesses and documents the qualities, characteristics, and social importance of the receiving environment, and presents an estimated level of impact using a combination of professional judgement and mathematical methods.
Native Title Act 1993	The *Native Title Act 1993* recognises the traditional 'rights and interests' that certain groups of Aboriginal or Torres Strait Islander People have rights and interests to certain areas of land. These rights and interests may include: • The right to build shelters, live and camp on the area • The right to hunt, fish or collect food • The right to visit and protect places of cultural importance • The right to conduct ceremonies. Impacts to these rights and interests from Landscapes and Visual Amenity impacts may stem from: • Direct loss of mythological sites associated with specific or rare landforms (rock pools, outcrops etc.); and/or	The Project is located within one native title determination area, Yamatji Nation (WCD2020/001).

Applicable Legislation	Relevance	Consideration Under this Assessment
	• Loss of a sense of enjoyment or fulfilment when practicing Native Title rights or interests (access restrictions to high value areas, loss of camp sites etc.). Native Title can exist alongside the rights of other land holders (e.g., pastoral lessees, *Mining Act 1978* tenure). As Native Title is a legal recognition of traditional lands, it is important that the needs of Claimants and Determinants are considered when assessing visual and landscape impact.	
State Law		
Environmental Protection Act 1986 (EP Act)	Section 3(1) of the EP Act defines 'environment' as: *Environment, subject to subsection (2), means living things, their physical, biological, and social surroundings, and interactions between all of these.* Section 3(2) of the Act goes on to state: *In the case of humans, the reference to social surroundings in the definition of environment in subsection (1) is a reference to aesthetic, cultural, economic, and other social surroundings to the extent to which they directly affect or are affected by physical or biological surroundings.* When a proposal is assessed under the EP Act, the EPA may consider a proposal's impacts to visual amenity under its guidance framework for environmental factors based on a number of environmental factors and protection objectives listed in the Statement of Environmental Principles, Factors and Objectives (EPA 2023b). The factors and objectives generally relevant to landscape and visual impacts are: • Landforms: "To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected." (EPA 2018) • Social Surroundings: "To protect social surroundings from significant harm" (EPA 2023a).	Under the Landforms factor, the EPA considers possible impacts such as the removal or alteration of the landform's defining geology, morphology or abiotic processes and the level of dependent environmental values (EPA 2018). Similarly, under the Social Surroundings Factor, the EPA considers activities that may impact the amenity of social surroundings or aesthetic values (EPA 2023a).

Applicable Legislation	Relevance	Consideration Under this Assessment
	The EPA's consideration of impacts to Landforms is distinctly separate from impacts to Social Surroundings. Where a landform and associated landscape may hold socio-cultural significance, assessment of potential impacts falls under the Social Surroundings factor. Typically, the significance of landforms is valued based on their variety, integrity, ecological importance, scientific importance, and rarity (EPA 2018). This VIA does not assess impacts to ecological function as these are assessed by other technical disciplines.	
Aboriginal Heritage Act 1972 (AH Act)	The AH Act provides for the identification and protection of places and objects of traditional importance to Aboriginal People in Western Australia, managing activities that may harm that heritage and promote an appreciation of Aboriginal cultural heritage Aboriginal Heritage 'Sites' are typically divided into two overarching categories: • Mythological Sites: ethnographic sites with values that are not necessarily physical in form, often associated with the Dreamtime (e.g., rivers, waterholes, landforms); and • Archaeological Sites: sites with culturally important physical relics or artefacts (e.g., artefact scatter, middens, rock art).	No known Aboriginal Heritage places are within the Project Area. There are a number of Aboriginal Heritage places located within the broader Study Area, including: • Yarra Yarra Lakes (Registered) (ID 24382) • Arrowsmith River (Registered) (ID 30068) • Bimara (Registered) (ID 22432)
Non-Legislative Requirements		
Statement of Planning Policy No 2: Environment and Natural Resources Policy (2003)	The Western Australian Planning Commission's (WAPC) Statement of Planning Policy No. 2: *Environment and Natural Resource Policy* (2003) states that the objective of the policy is to: • Identify and safeguard landscapes with high geological, geomorphological, or ecological values, as well as those of aesthetic, cultural or historical value to the community, and encourage the restoration of those that are degraded	This assessment aims to meet the objectives of the Policy by identifying landscapes with high values and considers their capacity to absorb changes.

Applicable Legislation	Relevance	Consideration Under this Assessment
	• Consider the level or capacity of the landscape to absorb new activities and incorporate appropriate planning and building design and siting criteria to ensure that new development is consistent and sensitive to the character and quality of the landscape. • Consider the need for a landscape, cultural or visual impact assessment for land use or development proposals that may have a significant impact on sensitive landscapes.	

2.0 Regional Context

This section considers the social, economic, and environmental context in the areas surrounding the Project. These aspects provide insight into the overall visual quality and perception of an area that is, the overall 'View Experience' (WAPC 2007). While the elements that make a landscape are based on environmental and other physical factors, socioeconomics and demographics are largely responsible for how landscapes are experienced.

The Project Area was defined as described in Section 3.2.1 and the Study Area of 170,780 ha was defined as described in Section 3.2.1 (Figure 1).

2.1 Social Surrounds

The Study Area is located within the Shire of Three Springs. This Local Government Authority (LGA) includes the towns of Three Springs and Arrino.

The Shire of Three Springs' population was 575 at the last reported census (ABS, 2021).

2.1.1 Local Population

The closest major population centre is the town of Three Springs, approximately 24 km northeast of the Project Area and partially within the Study Area. The last reported census recorded a population of 356, with 50.8% being male and 49.2% being female and a median age of 46 years (ABS, 2021). Aboriginal and Torres Strait Islander people made up 12.9% of the recorded population (ABS, 2021).

The Aboriginal population of Three Springs was recorded as 46 in 2021 with 43.7% being male and 56.3% being female (ABS, 2021). Native title determinations in the Study Area have been made to the Yamatji Nation people (Figure 3).

2.1.2 Existing Infrastructure

The Study Area is located in a regional area where existing infrastructure is primarily limited to roads, agricultural land and equipment. Additional infrastructure (e.g., towns and settlements) are located within the Study Area but beyond the Project Area.

2.1.3 Land Use and Land Tenure

The Study Area represents a combination of various land use and land tenures. Land tenure in the Study Area is predominantly freehold utilised for agricultural land uses. Overlapping tenure include:

- Native Title Determination: Yamatji Nation (WCD2020/001)
- Indigenous Land Use Agreement (ILUA): Yamatji Nation Agreement (WI2020/002)
- MGM Pipelines Pty Ltd mining tenement (Miscellaneous Licence) (L7000155).

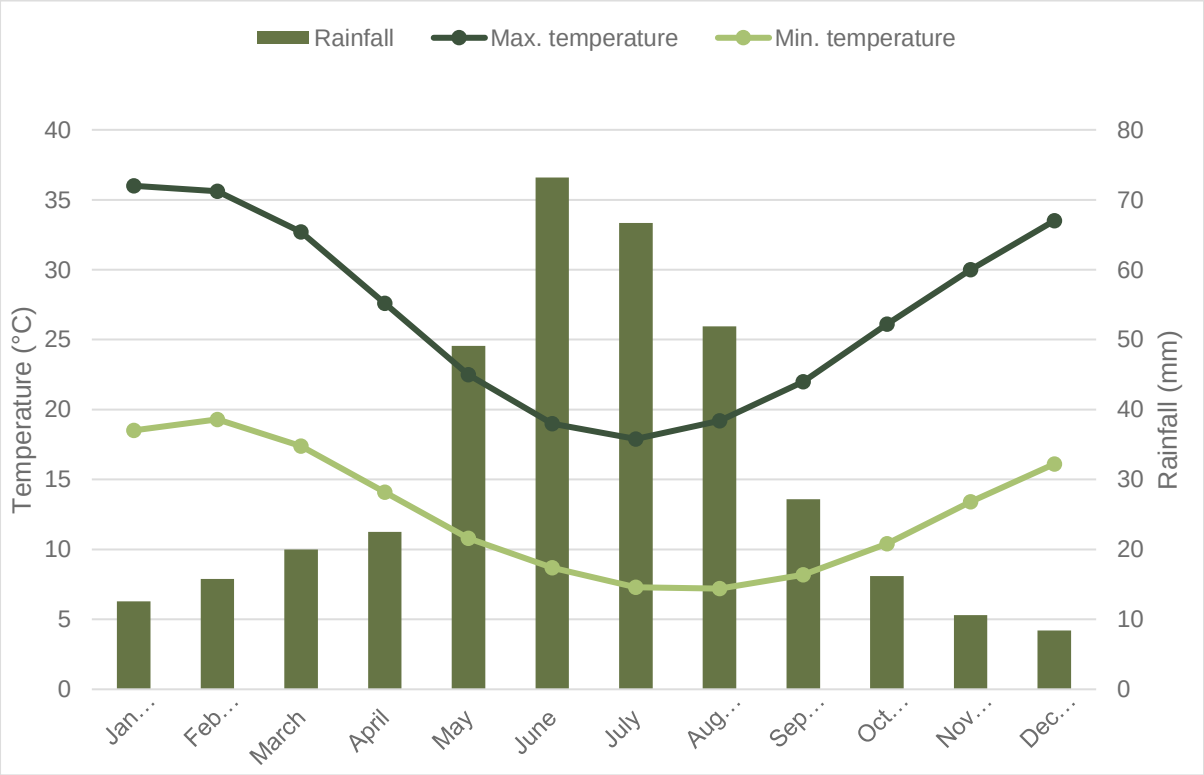
2.2 Physical Surrounds

While socio-economic and demographic factors are largely responsible for view experiences (e.g. people may view the land in the context of recreation / tourism, or in the context in their role as an employee or contractor to the agricultural sector), the inherent visual amenity or landscape value is defined by biotic and abiotic environmental factors.

2.2.1 Climate

The climate of the Geraldton Sandplains region is a warm, semi-arid Mediterranean climate with a yearly rainfall of between 400 – 500mm. Climate data was obtained from the Carnamah (008025) station, which is the closest data collection site (Graph 1). The annual mean maximum temperature is 26.8ºC and the annual mean minimum temperature is 12.6ºC (BoM, 2024). The average annual rainfall for this station is 374.9 mm.

Rainfall in the Geraldton Sandplains region varies significantly across the year as well as between years. Due to the position on the coast, this bioregion experiences major climatic chances across relatively short distances between mediterranean and arid (Guthrie, 2010). The climate varies from a cooler, wetter Mediterranean climate near the coast to a warmer, drier Eremaean climate further inland (Guthrie, 2010). The driest months are November to January, and the wettest months are in Winter (June to August) (BoM, 2024).



Graph 1: Carnamah (008025; BoM 2024)

2.2.2 Land Systems

Land system mapping is based on regional patterns in topography, soils, and vegetation. Land system mapping classifies the Pilbara into 106 land systems and is captured across three studies (Payne et al. 1988; Payne & Tille 1992; Van Vreeswyk et al. 2004). The extent of these land systems within the Study Area is summarised in Table 2 and Figure 4. All land systems are distributed beyond the Study Area.

Table 2: Extent of Land Systems within the Study Area

Land System	Description (DPIRD, 2018)	Extent within Study Area (ha)	Proportion Of Study Area (%)
Coalara System	Partially dissected plateau with lateritic caps and intervening sandy drainage lines; Pale and yellow deep sand, sandy gravels and sand over gravel.	72,784.6	42.62
Mooladara Hill System	Sandplain with dissected lateritic outcrops on margins and prominent dry valleys and drainages; west of Three Springs; Yellow, pale and brown deep sands, sand over gravel, minor sandy gravel, sandy duplexes; Banksia woodland and scrub heath.	12,488.6	7.31
Otorowiri System	Undulating to rolling sandplain and low hills. Gentle to moderately steep valley sides at margins of Mooladara Hill System. Spring lines are a common occurrence.	12,502.9	7.32
Mount Adams System	Gently undulating sandplain with low gravel ridges and occasional laterite breakaways.	13,064.7	7.65
Boothendarra System	Subdued stripped lateritic plateau, undulating and gently undulating rises; Sandy duplexes, pale deep sand, sandy and loamy gravels and minor clays.	4,812.8	2.82
Launer System	Sandplain of gently undulating to level plain with minor gently undulating rises, dunes common; pale and yellow sands with minor sandy earth and duplexes; sandstone.	10,868	6.36
Nebru System	Irregular low hills and footslopes. colluvium and laterite, conglomerate, sandstone and siltstone. Yellow deep sands with yellow sandy earths, shallow sandy and loamy gravels, sandy duplexes and calcareous loamy earths. Mallee and woodlands.	23,159	13.56
Dudewa System	Gently undulating terrain with stony rises, mainly partially stripped hill slopes. colluvium and alluvium. Red and brown loamy duplexes and earths and calcareous loamy earths. York gum and salmon gum woodland, wandoo woodland.	4,919.4	2.88
Mullingara System	Undulating to steep low hills with numerous rocky ridges and hillcrests; Red deep and shallow sandy duplexes, with loamy duplexes and shallows loams.	1,484.6	0.87
Winchester West System	Alluvial plain with lakes and channels. Alluvium. Loamy duplexes and earths, some saline.	13,959	8.17
Winchester North West System	Alluvial plain with lakes and channels. Alluvium. Loamy duplexes and earths, some saline.	408.6	0.24

Land System	Description (DPIRD, 2018)	Extent within Study Area (ha)	Proportion Of Study Area (%)
Yerramullah System	Subdued dissected lateritic plateau, undulating low hills and rises on lateritised weathered sandstone. Pale deep sand, sandy gravels and yellow deep sand. Banksia woodlands on lower slopes/depressions, heathlands elsewhere.	326.9	0.19

2.2.3 Vegetation

2.2.3.1 Vegetation

The Biogeographic Regionalization of Australia (IBRA) divides Australia into 89 bioregions based on major biological and geographical/geological attributes. These bioregions are subdivided into 419 subregions, as part of a refinement of the IBRA framework. The majority of the Study Area is located across the Lesueur Sandplain (GES02) subregion of the Geraldton Sandplains bioregion, and the northeastern portion of the Study Area is located in the Merredin subregion (AVW01) subregion of the Avon Wheatbelt bioregion.

2.3 Valued Characteristics

Importance is placed on landscape by individuals, communities and public bodies. GLVIA (Landscape Institute 2013) describes landscapes as important as they provide:

- A shared resource
- An environment for flora and fauna
- The setting for day to day lives — for living, working and recreation
- Opportunities for aesthetic enjoyment
- A sense of place
- Continuity with the past through its relative permanence and its role in acting as a cultural record of the past
- A source of memories and associations, which in turn may contribute to wellbeing
- Inspiration for learning, as well as for art and other forms of creativity.

In terms of visual value, Visual Landscape Planning in Western Australia (VLPWA) (WAPC 2007), identifies preferred natural landscape indicators as high degree of ‘naturalness’, landform and vegetation variety, presence of water, distinctive colours, seascapes, unusually expansive landforms (deserts, beach and dune fields, rolling hills), and distinctive landscape features.

A ‘value’ is an implicitly subjective term, however combining the GLVIA description of importance of landscapes and the VLPWA definition of preferred landscapes indicators, the term ‘value’ is considered to be a feature that positively contributes to the visual character of the landscape or a feature that enables cultural or recreational pursuits.

The Study Area contains a variety of valued characteristics related to landscape. These primarily include:

- Aboriginal heritage
- Agricultural land

- Lakes
- National Parks and Reserves.

3.0 Methods

3.1 Section Summary

This VIA follows the methodology outlined in the DPI/WAPC (2007) Guidelines for Visual Impact Assessments:

- Step 1. Describe existing visual landscape character
- Step 2. Describe the proposed development
- Step 3. Describe and evaluate the potential visual impacts
- Step 4. Develop visual management measures
- Step 5. Prepare final recommendations.

The methods used are consistent with the current guidance for Landscape and Visual Impact Assessments. Impacts described in this report were determined from a combination of a Desktop Assessment, Field Assessment and Visual Impact Analysis. The methods are described below.

3.2 Desktop Assessment

3.2.1 Defining the Study Area

The selection of an appropriate Study Area was a key component of this assessment as it defined the area within which all impacts from the Project were assessed. When defining the Study Area, two key requirements needed to be met:

- Covers the entirety of the area of the Project's operations, i.e., the proposed disturbance footprint and proposed infrastructure such as PV solar panel array and solar inverter stations (the 'Project Area')
- Encompasses the nine viewpoints identified by SLR.

A radius of 25 km from the development area was selected for this assessment for the following reasons:

- It is further than the human eye can reasonably see (given the curvature of the earth)
- It contains a variety of Landscape Character Units (LCUs, defined in 3.2.2).

The resultant Study Area is 170,780 ha in size covering the area shown in Figure 1.

3.2.2 Identifying Landscape Character Units

Landscape Character is typically defined by the combination of physical/environmental elements and aesthetic elements and socio-cultural elements. While it is possible to define the former using available data for environmental elements such as soil, geology and vegetation, the latter can only be defined through consultation and firsthand experience.

LCUs were initially based on Land Systems, as the physical component of landscapes are generally heavily influenced by the geomorphology and vegetation of an area. Review of Land System descriptions against local-scale vegetation mapping, aerial imagery and photographs taken of the region during the site visit showed the similarities between several

Land Systems from a VIA perspective, enabling them to be considered together. The final LCUs are shown in Figure 5.

3.2.3 Identification of Viewpoints

Viewpoints were identified by SLR based on desktop assessments of the surrounding area, which identified points of interest including nearby residents, major roads, nature reserves and Aboriginal Cultural Heritage sites. Viewpoints selected were determined to best represent a range of distances, sensitivities and differing views of the Project. As well as this, LCU mapping was used to determine viewpoints to ensure visual impacts were considered for all major landscape units within the vicinity of the Project. The viewpoints shown in (Figure 2) were visited during the field assessment, with images captured at each location.

3.3 Field Assessment

3.3.1 Survey Timing

Visual amenity and landscape values in the Study Area were surveyed on 14 and 15 January 2025 by a Project Consultant from SLR Consulting. The Study Area was traversed by vehicle and foot. Each viewpoint was visited, and its Global Position System (GPS) coordinates recorded. Key information on the site was also recorded in the format detailed in Table 3.

Table 3: Field Assessment Criteria

Criteria	Characteristics
Location	Co-ordinates
Site Name	Unique identifier for each site
Viewpoint Setting	The location of the site assessment described (e.g. ‘north east corner of lookout’ or ‘end of pier’)
Local Vegetation Type	General classification of vegetation at a site (shrubs, grasses, trees etc.)
Vegetation Screening Potential	Potential of surrounding vegetation to obscure views of the Project
Foreground Elements	Elements that make up the landscape in the immediate vicinity of the observer
Mid-Ground Elements	Elements that make up the landscape in between the foreground and background
Background Elements	Elements that make up the landscape furthest away from the observer
Viewer Motion	Speed that an observer may be moving at (affects view duration)
Accessibility	Level of accessibility of the area by members of the public (major roads = high, minor/local roads and tracks = moderate, private roads/remote tracks = low)
Usage Type	Apparent level of usage (based on signs of human activity such as vehicle tracks, extinguished fires, visual observation of activity etc.)
Photography	Number of, direction, settings, and any notes on photography from the location

3.3.2 Site Photography Specifications

All digital photographs were taken with a Canon SLR Camera (DS126741) and a Canon EFS lens (18 to 55 mm). Images were taken from a height of approximately 1.6 m above ground. All images were captured using automatic settings at the maximum resolution of the camera. No in/on camera filters or effects were used.

3.4 Digital Analysis

3.4.1 Viewshed

To identify potential viewpoints and the theoretical visual catchment of the proposed Project, a Zone of Theoretical Visibility (ZTV) was prepared. This zone is generated by undertaking a viewshed analysis using Geographic Information Systems and a 3D elevation model of the proposed development and the surrounding topography. The elevation model does not contain any existing vegetation or structures due to the lack of available detailed data that may reduce the visibility. The model inputs were obtained using available data including the proposed development (provided by Trina Solar) and elevation data (sourced by SLR Consulting SRTM Elevation Data).

3.4.2 3D Site Model

To simulate the predicted visual impact and generate photomontages, key project elements were modelled using ArcGIS Pro and Blender. The terrain was defined using the 1-second SRTM Level 2 Derived Digital Elevation Model (DEM) v1.0, sourced from the ELVIS Elevation and Depth - Foundation Spatial Data platform. A 3D terrain model was constructed using the DEM as the input elevation surface. Solar tracker specifications were scaled and modelled accurately in Blender as was the ancillary infrastructure including the BESS, substation components and equipment/switch sheds. Modelling of these components was based on Preliminary Drawings provided by the Client.

The arrangement of the proposal in the 3D Model was based on the Preliminary Solar Farm Overview Rev 3.0A plans.

To ensure consistency with the actual site, both the High Voltage Overhead lines and towers and some key vegetation were also included and placed accurately according to recent aerial imagery.

3.4.3 Photomontage Creation

The 3D models were positioned within an ArcGIS Pro 3D scene to simulate the bare-earth environment and provide an unobstructed view of the proposed project from designated viewer locations. For each location, high resolution exports of the modelled environment were overlaid onto site photographs to create realistic photomontages. This blending process considered vegetation screening, coloration, and texture of site elements to enhance accuracy and effectively assess the impact on visual amenity. Photoshop was then used to paint in the tracker arrays and other equipment according to their relative position in the overlaid 3D Scene. Visual blending, glare and atmosphere were added to present a more realistic representation of the proposal.

3.5 Visual Impact Analysis

3.5.1 Landscape Values and Viewpoint Sensitivity

The finalised LCUs were evaluated based on a visual landscape character preference and in the context of their rarity in the Study Area using the matrix shown in Table 4.

Visual landscape character preference was defined as per Appendix 7 of VLPWA (WAPC 2007), which identifies 'most preferred' natural landscape indicators and includes characteristics such as high degree of 'naturalness', landform and vegetation variety, presence of water, distinctive colours, seascapes, unusually expansive landforms (deserts, beach and dune fields, rolling hills), and distinctive landscape features. Less preferred characteristics include evidence of reduced quality or condition such as disturbance, weed infestation, erosion, and degraded water bodies.

Table 4: Evaluation Matrix for Landscape Value

		Visual Landscape Character Preference		
		Low (Little to no 'preferred' indicators; low quality/ condition)	**Moderate** (Some 'preferred' indicators; average to good quality/ condition)	**High** (Many 'preferred' indicators; very high quality/ condition)
Rarity	**Not Rare** (>20% Study Area)	Negligible	Low	Medium
	Somewhat Rare (>5% but <20% Study Area)	Low	Medium	High
	Rare (<5% Study Area)	Low	High	High

As described in VLPWA, significance of viewer experience and views increases with:

- Importance of views, including type, features and rarity
- Volume of use of roads, trails and navigable waterways
- Degree of sensitivity of viewers
- Degree to which experiencing the landscape is integral to enjoyment of a travel route or site
- Length of duration of a view.

Viewpoint sensitivity is derived from GLVIA and WAPC (2003) using a combination of factors including:

- Viewer interest in the visual environment (high, medium, low, or negligible) interest in their everyday visual environment and the duration of the affect
- Viewing opportunity (prolonged, regular viewing opportunities)
- Number of viewers and their distance / angle of view form the source of the effect, extent of screening / filtering of view.

Whilst the assessment of the visual values and effects is largely measured on a qualitative basis, assessment against scale enables a more objective evaluation and comparison of sensitivity of receptors and magnitude of effects.

The viewpoint sensitivity rating is High, Medium, Low or Negligible and is described below in Table 5.

Table 5: Viewpoint Sensitivity/Value Ratings

Sensitivity	Definition
High	• Visitors to heritage sites, regionally important locations, scenic routes / regional gateways, lookouts within 2-3 km (or closer) with quality views, important views of the site and surrounding areas where landscape is the specific focus. • High numbers of visitors • Views to landscape that are rare and / or unique and are possibly vulnerable to change. • Views from residences within 1 km of the site and are representative of high-quality views
Medium	• Travellers / visitors along roads or rail routes that are not scenic routes but offer quality views of significant landscape features. • Recreational users / viewers beyond 2-3 km from the site with moderate interest in their surrounds. • Medium numbers of visitors / residents (suburban and rural residents). • Views that are representative of local character or sense of place but are not rare or unique • Views from residences within 3 km buffer of the site or are representative of moderate quality views
Low	• Travellers / visitors along roads or rail routes that are not scenic routes but offer reasonable views of significant landscape features • Neighbourhood gateways that characterise the rural residential and residential visual quality of the area • Recreational users not dependent on views or scenic quality of landscape. • View experienced take in broad context with which site is visible but not an important element. • Small numbers of visitors with passing interest in their surroundings (those travelling along mid-level roads). • Viewers whose interest is not specifically focused on landscape or scenic qualities (local residents, commuters and workers)
Negligible	• Very occasional or low level of users with passing interest in their surrounds (those travelling along minor roads or views from the air). • Travellers / visitors along roads offering views greater than 1 km of the site.

3.5.2 Magnitude of Change

The magnitude of change to the landscape character depends on the nature, scale, intensity, extent, and duration of the impacts / change due to the development proposal. The magnitude of change also depends on the loss, change or addition of any features to the existing landscape and is based on the landscape character type that is most likely to be impacted by the project prior to the addition of any mitigation measures.

The magnitude of change is rated as High, Medium, Low or Negligible as described below in Table 6.

Table 6: Magnitude of Change

Magnitude	Definition
High	**Dominant Change:** • Major change in view at close distances, affecting substantial part of the view continuously visible for a long duration or obstructing a substantial part or important elements of the view. • Overwhelming loss or additional features in the view such as the nature of view or landscape character fundamentally changed. • Views to key landscape features affected. • Visual amenity of local residents or road users substantially diminished. • Substantial change to the landscape due to loss of and / or change to elements, features or characteristics of the landscape creating an overall worsening of visual quality of the landscape character
Moderate	**Considerable Change:** • Clearly perceptible changes in views at intermediate distances resulting in either distinct new element in a significant part of the view or a more widely ranging, less concentrated change across a wider area. • Significant loss or addition of features in the view, such that the nature of view or character of landscape is altered. • Considerable contrast of any new features that the nature of the view or landscape character is changed. • Noticeable contrast of any new features or changes compared to existing landscape. • Views to key landscapes partially obstructed but views remain intact.
Low	**Noticeable Change:** • Minor memorable change to the landscape or views. • Temporary or reversible impact. • Landscape dominant element and built form / development well integrated within it. • Little permanent change or no fundamental change to local landscape character
Negligible	**Barely perceptible change:** • Change to landscape character or key views is rarely perceptible and/or not memorable
None	**No change:** • The Project is not visible • No change to landscape character or views

3.5.3 Impact Significance

The impact significance provides a qualitative rating of the potential impact the proposed development on the visual landscape when viewed from key vantage point locations. It is the evaluation of the receptor sensitivity and magnitude of change that identifies the extent to which the proposed changes will alter the existing landscape character.

Using impact statistics for determining landscape impacts in isolation of other human elements is not considered to be best practice under GLVIA. At present, there are no

standard categories for significance in consideration of all landscape components. GLVIA recommends that any method used is clear and consistent.

As outlined below in Table 7 the impact significance is determined via the lookup matrix where the ratings previously determined for receptor sensitivity and magnitude of change inform the impact significance rating.

The impact significance is rated as High, Moderate-High, Moderate, Minor-Moderate, Minor, Minor-Negligible and Negligible

Table 7: Evaluation Matrix for Visual Impact Ratings

Sensitivity/Value/Rarity	Magnitude of Change			
	Negligible (Barely Perceptible Change)	**Low (Noticeable Change)**	**Moderate (Considerable Change)**	**High (Dominant Change)**
Negligible	Negligible	Minor-Negligible	Minor	Minor-Moderate
Low	Minor-Negligible	Minor	Minor-Moderate	Moderate
Medium	Minor	Minor-Moderate	Moderate	Moderate-High
High	Minor-Moderate	Moderate	Moderate-High	High

The above matrix was used to rate potential visual impacts to all surveyed sites.

3.6 Limitations and Assumptions of the Analysis

There are several limitations to consider when interpreting the results of the assessment. Most notably:

- Interpretation of photomontages is generally a subjective matter that is dependent on professional judgement. Where possible, a framework for clear and consistent impact judgement has been provided; and
- Characterisation of landscapes is largely based on professional judgement. The experiences and values often differ between individuals.

4.0 Results

4.1 Landscape Character Units

Three LCUs were identified within the Study Area (Figure 5):

- Agricultural Land
- Remnant Vegetation
- Water Bodies

The extent of these LCUs in the Study Area are summarised in Table 8 and descriptions of each LCU are summarised in Sections 4.1.1 to 4.1.3.

Table 8: Extent of LCUs in the Study Area

LCU	Area (ha)	% Study Area
Agricultural Land	124,140.68	72.69
Remnant Vegetation	32,272.29	8.41

LCU	Area (ha)	% Study Area
Water Bodies	14,367.53	18.90

4.1.1 Agricultural Land

Plate 1 and Plate 2 show typical views of the Agricultural Land LCU and Table 9 provide a summary description of the Agricultural Land LCU.



Plate 1: Typical view of the Agricultural Land LCU



Plate 2: Typical view of the Agricultural Land LCU

Table 9: Details of the Agricultural Land LCU

Criteria	Characteristics
Extent in Study Area	124,140.68 ha (72.69%)
Environmental Aspects	
Vegetation	Paddocks of crop – grains, predominantly wheat
Landforms	Plains, low rises
Related Land Systems	Dudewa, Nebru, Launer, Coalara, Boothendarra, Yerramullah, Otorowiri, Mount Adams, Mooladara Hill, Mullingara
Local Rarity	Not Rare (>20 % of Study Area)
Aesthetic Values	
Visual Elements	Expanses of green, yellow, light brown vegetation against a blue sky.
Socio-Cultural Values	
Land Uses	Agriculture
Landscape Value	**Low** Not Rare x Moderate Landscape Preference
Magnitude of Change	**Low** No fundamental change to landscape character
Landscape Impact	**Minor**

4.1.2 Remnant Vegetation LCU

Plate 3 provides a typical view of the Remnant Vegetation LCU and Table 10 provides a summary description of the Remnant Vegetation LCU.

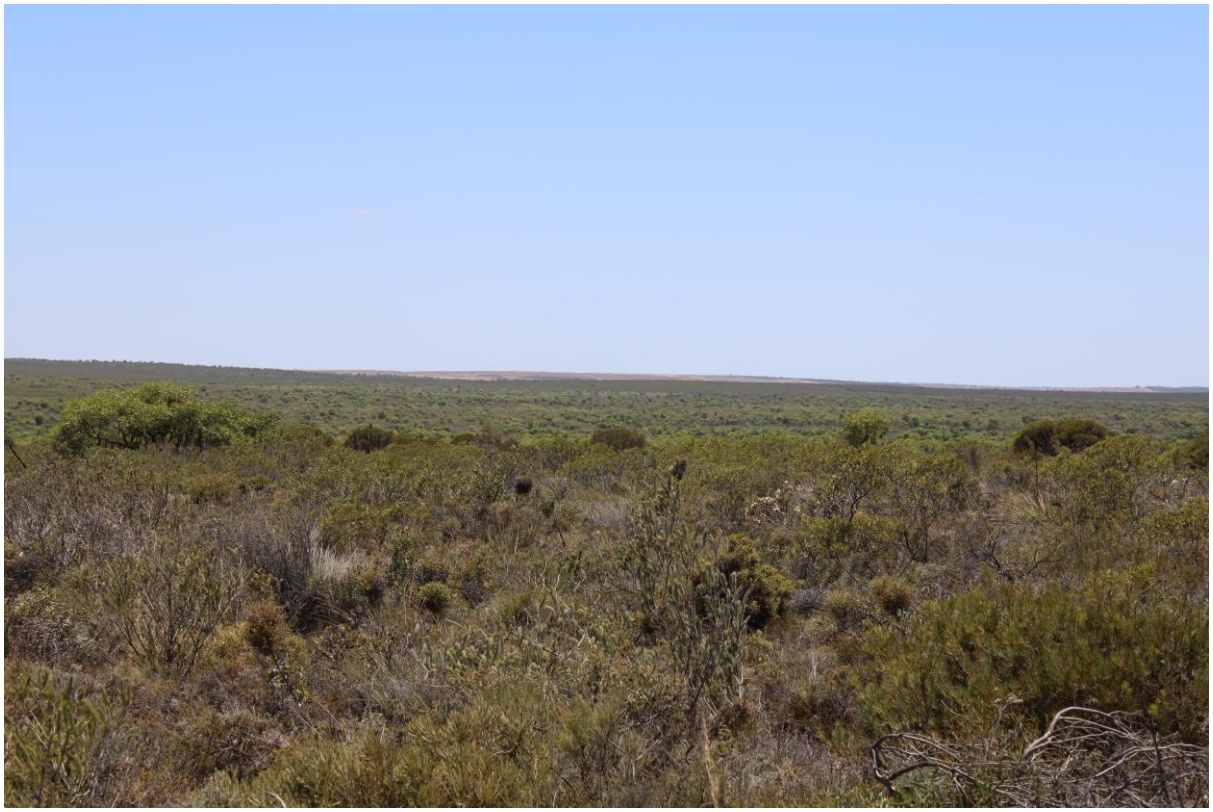


Plate 3: Typical view of the Remnant Vegetation LCU

Table 10: Details of the Remnant Vegetation LCU

Criteria	Characteristics
Extent in Study Area	32,272.29 ha (18.90%)
Environmental Aspects	
Vegetation	Mixed heath, scattered tall shrubs
Landforms	Plains, low rises, breakaways
Related Land Systems	Launer, Nebru, Coalara, Boothendarra, Otorowiri, Mooladara Hill, Mount Adams
Local Rarity	Somewhat Rare (>5% but <20% of Study Area)
Aesthetic Values	
Visual Elements	Sandplains with yellow and pale sands, low hills or slopes, narrow valleys, contrasting mix of blue sky and green/brown vegetation.
Socio-Cultural Values	
Land Uses	Recreation, conservation, tourism This LCU may be used for traditional activities such as hunting and camping by native title holders.

Criteria	Characteristics
Landscape Value	**High** Somewhat Rare x High Landscape Preference
Magnitude of Change	**Low** No fundamental change to landscape character
Landscape Impact	**Moderate**

4.1.3 Water Bodies LCU

Table 11 provides a summary description of the Water Bodies LCU.

Table 11: Details of the Water Bodies LCU

Criteria	Characteristics
Extent in Study Area	14,367.53 ha (8.41%)
Environmental Aspects	
Vegetation	Mixed heath, scattered tall shrubs, woodlands
Landforms	Alluvial plains with lakes and channels
Related Land Systems	Winchester West, Winchester North West, Dudewa
Local Rarity	Somewhat Rare (>5% but <20% Study Area)
Aesthetic Values	
Visual Elements	Plains with lakes and channels, contrasting mix of blue sky and green/brown vegetation.
Socio-Cultural Values	
Land Uses	Recreation, conservation, tourism This LCU may be used for traditional activities such as creation/ dreaming narrative, landscape/ seascape feature
Landscape Value	**High** Somewhat Rare x High Landscape Preference
Magnitude of Change	**Negligible** No change to landscape character
Landscape Impact	**Minor-moderate**

4.2 Viewshed Analysis

The viewshed analysis results indicate that the Project Area is visible from most locations within 1 km of the Project Area (noting the viewshed shows theoretical visibility and does not account for screening from vegetation or infrastructure) (Figure 6). Generally, views of the Project from over 5 km away are predicted to be limited due to the surrounding topography.

4.3 Descriptions of Surveyed Viewpoints

A total of nine viewpoints were assessed following the site visit. The locations of these points are presented in Table 12 and are illustrated in Figure 2. Four of the viewpoints, the key viewpoints, were further assessed to consider the potential visual impact to the sites based on the viewpoint's visibility and/or proximity to the Project, which was determined using the 3D scenes that were created prior to the photomontages. These key viewpoints are show in

bold font in Table 12. Assessment of key viewpoints is provided in Section 4.3. Assessment of viewpoints without visibility of the Project and not in close proximity to the project are provided in Appendix A.

Table 12: Surveyed Viewpoints

Viewpoint	Viewpoint	Easting	Northing	Viewpoint Sensitivity
1	**Wotto Nature Reserve**	**0349661**	**6707515**	**High**
2	Tathra National Park	0357308	6702329	High
3	Carnamah-Eneabba Road	0370208	6702763	Medium
4	Yarra Yarra Lakes	0380296	6715636	High
5	**Dookanooka Nature Reserve**	**0368078**	**6724721**	**High**
6	**Three Springs-Eneabba Road**	**0357915**	**6714727**	**High**
7	**Turkey Flat Road**	**0364438**	**6711803**	**Medium**
8	Three Springs town	0379678	6731873	High
9	Frog Valley	0345593	6722794	Medium

4.3.1 Site 1 – Wotto Nature Reserve

The view from Site 1 is presented in Plate 4 and details are summarised in Table 13.



Plate 4: Site 1 – Wotto Nature Reserve

Table 13: Site 1 – Wotto Nature Reserve

Criteria	Characteristic
Location	Easting / Northing: 0349661/6707515
Date	14/01/2025
Site Code	Site 1
Viewpoint Setting	Wotto Nature Reserve
Local Vegetation Type	Roadside native vegetation, crop – wheat
Vegetation/Topography Screening Potential	80%
Foreground Elements	Main road – Eneabba-Three Springs Rd, native vegetation
Mid-Ground Elements	Farm house / shed, crop / agricultural land, power poles and lines
Background Elements	Trees in distance, crop, hills
Viewer Motion	110 km/h
Accessibility	High
Usage Type	High
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: NE
After the field visit and in consideration of the desktop assessment, Site 1 was rated as **high sensitivity** due to the site being located in a nature reserve. Site 1 is also located along Eneabba-E Springs Road, a common tourist route for wildflowers. The magnitude of change has been rated as **none** as the Project will not be visible from this site. Site 1 has, therefore, been assigned an impact rating of **none**. Although visual impact is not expected at Site 1, given the site's high sensitivity and proximity to the Project, further assessment of the site, including preparation of a photomontage, was completed (see Section 4.3).	

4.3.2 Site 5 – Dookanooka Nature Reserve

Site 5 is located on the southern edge of Dookanooka Nature Reserve. The view from Site 5 facing away from the reserve is presented in Plate 6 and details are summarised in Table 14.



Plate 5: Site 5 – Dookanooka Nature Reserve

Table 14: Site 5 – Dookanooka Nature Reserve

Criteria	Characteristic
Location	Easting / Northing: 0368078/6724721
Date	14/01/2025
Site Code	Site 5
Viewpoint Setting	Southern edge of Dookanooka Nature Reserve, facing away from the reserve
Local Vegetation Type	Crop – wheat, native vegetation – trees, shrubs
Vegetation/Topography Screening Potential	100%
Foreground Elements	Crop, gravel road
Mid-Ground Elements	Crop, trees
Background Elements	Crop, mostly screened by midground
Viewer Motion	30 km/h
Accessibility	Low/Medium
Usage Type	Low
Photography	Automatic exposure settings

Criteria	Characteristic
	Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: SSW
After the field visit and in consideration of the desktop assessment, Site 5 was rated as **high sensitivity** due to the site being located in a nature reserve. The magnitude of change has been rated as **none** as the Project will not be visible from this site. Site 5 has, therefore, been assigned an impact rating of **none**. Although visual impact is not expected at Site 5, given the site's high sensitivity and proximity to the Project, further assessment of the site, including preparation of a photomontage, was completed (see Section 4.3).	

4.3.3 Site 6 – Eneabba-Three Springs Road

The view from Site 6 is presented in Plate 7 and details are summarised in Table 15.



Plate 6: Site 6 – Eneabba-Three Springs Road

Table 15: Site 6 – Eneabba-Three Springs Road

Criteria	Characteristic
Location	Easting / Northing: 0357915/6714727
Date	15/01/2025
Site Code	Site 6
Viewpoint Setting	Eneabba-Three Springs Road
Local Vegetation Type	Crop, trees, shrubs

Criteria	Characteristic
Vegetation/Topography Screening Potential	30%
Foreground Elements	Road, roadside native vegetation, trees
Mid-Ground Elements	Crop / paddock, power lines and poles, trees, water tank, hills
Background Elements	Hills with trees, power lines and poles, crop / paddock
Viewer Motion	110 km/h
Accessibility	High
Usage Type	High
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: E
After the field visit and in consideration of the desktop assessment, Site 6 was rated as **high sensitivity** due to the site being a main road that is considered to be a common tourist route for wildflowers. The magnitude of change has been rated as **low** as the Project will be mostly screened by the topography and the solar farm does not result in an overall change to the character of the view due to existing modified elements. Site 6 has, therefore, been assigned an impact rating of **Moderate**. Further assessment of Site 6 is presented in Section 4.3.	

4.3.4 Site 7 – Turkey Flat Road

The view from Site 7 is presented in Plate 8 and details are summarised in Table 16.



Plate 7: Site 7 – Turkey Flat Road

Table 16: Site 7 – Turkey Flat Road

Criteria	Characteristic
Location	Easting / Northing: 0364438/6711803
Date	14/01/2025
Site Code	Site 7
Viewpoint Setting	Turkey Flat Road
Local Vegetation Type	Native vegetation, crop – wheat
Vegetation/Topography Screening Potential	100%
Foreground Elements	Roadside vegetation, gravel road, crop
Mid-Ground Elements	Power lines and poles, crop, trees
Background Elements	Power lines and poles, crop, trees, mostly screened by mid-ground
Viewer Motion	80 km/h
Accessibility	High
Usage Type	Low
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm)

Criteria	Characteristic
	Shots taken on lowest zoom setting (18mm) Facing: NW
After the field visit and in consideration of the desktop assessment, Site 7 was rated as **medium sensitivity** due to the site being a main road used by commuters and recreational users, the view is scenic and representative of local character but is not rare or unique. The magnitude of change has been rated as **none** as the Project will not be visible from the site. Site 7 has, therefore, been assigned an impact rating of **none**. Although visual impact is not expected at Site 7, given the site's high sensitivity and proximity to the Project, further assessment of the site, including preparation of a photomontage, was completed (see Section 4.3).	

4.4 Viewpoint Assessment Results

The following sections and Appendix A present a pre and post development view from the nine viewpoints. Photomontage analysis was required for four of the nine viewpoints with visibility or within close proximity of the Project.

4.4.1 Assessment of Site 1 – Wotto Nature Reserve



Plate 8: Site 1 – current view, looking northeast toward the Project



Plate 9: Site 1 – predicted view, looking northeast toward the Project

Site 1 captures a view from Wotto Nature Reserve, approximately 13.3 km southwest of the Project Area. The current view from Site 1 is partly natural with native vegetation and partly modified, with modified elements including a sealed road, industry developments and powerlines. The predicted view remains a mixed natural/modified view. Due to the topography, no changes to the view are expected, as indicated by the mark-up on the image of the predicted view. The Project will not change the character of the area from this viewpoint.

4.4.2 Assessment of Site 5 – Dookanooka Nature Reserve



Plate 10: Site 5 – current view, looking south-southwest from the southern edge of the reserve toward the Project



Plate 11: Site 5 – predicted view, looking south-southwest from the southern edge of the reserve toward the Project

Site 5 captures a view from the southern edge of Dookanooka Nature Reserve, approximately 8.9 km northeast of the Project Area. The current view from Site 5 is a predominantly modified view with agricultural land in the foreground, mid-ground and background. A small patch of native vegetation is present in the background. Modified elements in the current view include powerlines located in the background. The predicted view remains a predominantly modified view. Due to the topography, no changes to the view are expected, as indicated by the mark-up on the image of the predicted view. The Project will not change the character of the area from this viewpoint.

4.4.3 Assessment of Site 6 – Three Springs-Eneabba Road



Plate 12: Site 6 – current view, looking east toward the Project



Plate 13: Site 6 – predicted view, looking east toward the Project

Site 6 captures a view from Three Springs-Eneabba Road, approximately 3.2 km west of the Project Area. The current view from Site 6 is a mixed modified/natural view of agricultural land, modified elements and native vegetation. Agricultural land is present in the mid-ground with modified elements including Three Springs-Eneabba Road in the fore- and mid-ground and power lines in the background.

The predicted view remains a partly modified and partly natural view, with the Project infrastructure just visible in the background. The predicted view shows that due to the dark colouration and low-lying and reflective nature of the solar arrays, they are expected to blend in well with the terrain and surrounding vegetation. The substation is generally screened by the terrain and native vegetation and the BESS is entirely screened by native vegetation. Some sheds associated with the Project are expected to be visible on the horizon, however the predicted view shows they integrate well into the landscape. Although the top of the substation is visible, it blends in with the existing infrastructure and does not significantly change the view. The Project integrates well into the existing modified elements in the view and does not significantly alter the landscape beyond the existing changes as a result of the established modified elements. The predicted visibility of the Project from Site 6 is rated as low, and the Project infrastructure is not expected to result in an overall change to the character of the view due to the presence of existing modified elements and the limited visibility of the Project from Site 6.

4.4.4 Assessment of Site 7 – Turkey Flat Road



Plate 14: Site 7 – current view, looking northwest toward the Project



Plate 15: Site 7 – predicted view, looking northwest toward the Project

Site 7 captures a view from Turkey Flat Road, approximately 3.1 km southeast of the Project Area. The current view from Site 7 is a predominantly natural view of native vegetation with agricultural land visible in the background and modified elements including Turkey Flat Road on the right hand side of the image and power line in the background. The predicted view remains a predominantly natural view. Due to the topography of the area, the Project will not be visible from Site 7, as indicated by the mark up. No changes to the view are expected and the Project will not change the character of the area from this viewpoint.

5.0 Discussion

5.1 Landscape Impacts

Based on the results of the desktop and field assessments, a total of three LCUs were identified. Landscape value and impact for the LCUs were determined to be:

- Agricultural Land – low value and minor impact
- Remnant Vegetation - high value and moderate impact
- Water Bodies - high value and minor-moderate impact

Overall, the impact of the Project on landscape character is predicted to be minor-moderate. The LCUs occur widely outside the Study Area, so the impact from a broad LCU perspective is not considered to be significant.

5.2 Visual Impacts to Viewpoints

Table 32 provides a summary of the visual impact assessment for the nine viewpoints assessed using 3D scenes, including the four viewpoints (bold font) that were further assessed through generation of photomontages.

Table 17: Summary of Visual Impact Ratings

Viewpoint No.	Viewpoint	Viewpoint Sensitivity	Magnitude of Change	Impact Rating
1	**Wotto Nature Reserve**	**High**	**None**	**None**
2	Tathra National Park	High	None	None
3	Carnamah-Eneabba Road	Medium	None	None
4	Yarra Yarra Lakes	High	None	None
5	**Dookanooka Nature Reserve**	**High**	**None**	**None**
6	**Eneabba-Three Springs Road**	**High**	**Low**	**Moderate**
7	**Turkey Flat Road**	**Medium**	**None**	**None**
8	Three Springs	High	None	None
9	Frog Valley	Medium	None	None

Overall, the visual impact of the Project is expected to be limited, with the Project not expected to be visible from eight of the nine selected viewpoints due to the natural topography, screening provided by vegetation and distance to the Project.

The Project is sited within a predominantly rural area removed from recorded heritage sites, townsites and nature reserves. The Project area is relatively low-lying with natural screening potential provided by the topography and roadside vegetation and the Project design has utilised low-lying infrastructure where possible that connects with existing modified elements in the landscape.

The Project siting and design has considered the existing landscape character and sensitivity of the surrounding area. Following the *Guideline for landscape character and visual impact assessment* (2023), the topography, natural drainage, ecology, agricultural quality, heritage value and existing infrastructure has been assessed and incorporated into the design of the Project to reduce visual impacts. Through the design, size, siting and selected infrastructure, the Project has been designed to minimise alteration and disturbance to the landscape character within the surrounding area.

The Project is expected to be just visible from Site 6 (Three-Springs Eneabba Road). The visual impact at this location has been rated as moderate as the low-lying nature of the proposed infrastructure will largely result in it being screened from view by vegetation and/ or the topography of the land. Where the Project is expected to be visible, the significance of the change is limited as modified elements are already present in the existing views and, therefore, the Project is not expected to fundamentally change the landscape character at the assessed locations.

Consideration of the viewpoints and viewshed in relation to locations of heritage sites and conservation areas shows the Project will not be visible from those areas. Therefore, the Project does not result in the alteration or disruption to valued landscape characteristics of recorded heritage sites, waterbodies or national parks. These key features remain physically unaffected and largely visually unaffected. However, the Project does result in a minor-moderate visual impacts to the valued landscape characteristic of agricultural land and native vegetation.

During the construction phase of the Project, temporary visual impacts associated with dust may occur. Elevated dust levels may result in haze, reducing the visibility of environmental values in the landscape. This temporary impact is not expected to elevate the overall visual impact rating.

5.3 Cumulative Impacts

There is one additional Solar Farm located in the area:

- Three Springs Solar Farm located approximately 2 km northeast of the Three Springs Townsite. The Three Springs Solar Farm is in the proposal stage and is proposed to construct and operate at 100MW solar photovoltaic power station.

The Project is located approximately 24 km southwest of Three Springs Townsite and will consist of a 420MW solar photovoltaic power station, high voltage substation and a 400 MW storage capacity BESS. Implementation of the Project is not expected to result in a significant cumulative change in the valued landscape. Given the distance between the two projects, combined views of the Project and Three Springs Solar Farm are expected to be negligible, therefore the Project is unlikely to result in a combined visual effect.

5.4 Mitigation Measures

Mitigation measures may be considered to reduce the potential visual impact along Eneabba-Three Springs Road (Site 6) (rated moderate impact):

- Minimise the loss of existing vegetation.
- Informal planting of native shrubs along the Eneabba-Three Springs Road (northwestern) side of the lease area would assist in minimising visual impacts of the Project on surrounding rural landscapes and residences.
- Promote management of road corridor vegetation along Tukey Flat Road to encourage growth of native vegetation.
- Select infrastructure to minimise reflectivity and glare where possible.
- Design infrastructure to be low-lying with muted, low-contrast colouration wherever possible, to assist with integrating the Project into the landscape.
- Minimise the use of lighting and signage at the sub-station, BESS and associated buildings to that required for safe operation of the Project.

5.5 Conclusion

As demonstrated in the assessment, implementation of the Project is predicted to result in no visual impact to eight of the nine assessed viewpoints due to the screening effects of landforms and vegetation surrounding the Project. A moderate impact is predicted at one viewpoint (Site 6, Three-Springs Eneabba Road). At this viewpoint, the Project is expected to be visible in the background of the view but due to the dark colouration and reflective nature of the solar array and low height of the Project components, the infrastructure will blend in with topography and surrounding vegetation.

The Project is considered to have met the project-specific VMOs due to the following:

- The Project will not result in a dominant change in view for moderate to high sensitivity viewpoints that are located > 1 km from the Project.
- The Project will not result in the removal of valued characteristics, nor does it result in significant alteration or disruption to views of these valued characteristics.

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Figures

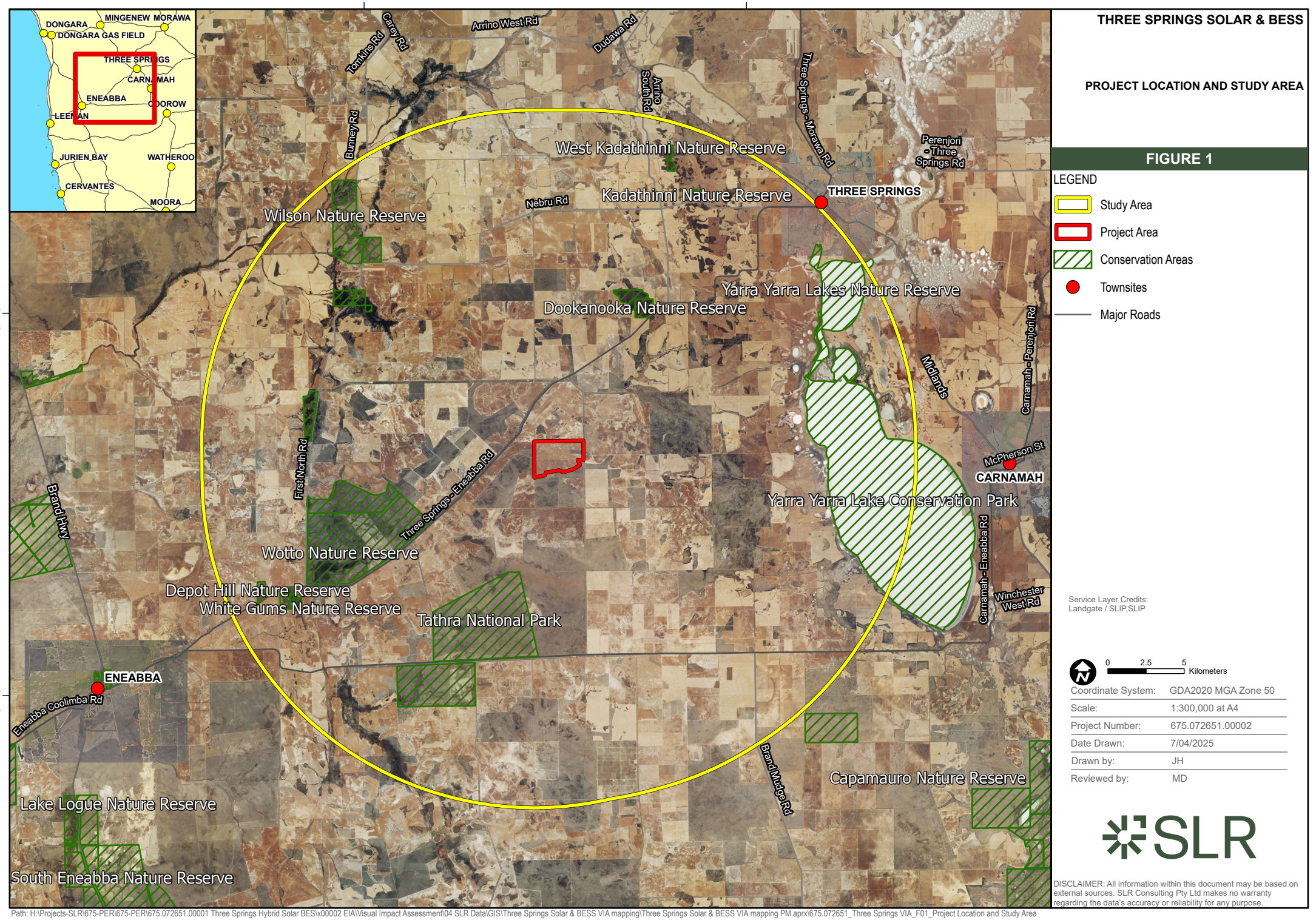
Visual Impact Assessment

Killawarra Solar Farm, Battery Energy Storage System (BESS) & Substation Project

Trina Solar (Australia) Pty Ltd

SLR Project No.: 675.072651.00001

11 April 2025



THREE SPRINGS SOLAR & BESS

PROJECT LOCATION AND STUDY AREA

FIGURE 1

LEGEND

- Study Area
- Project Area
- Conservation Areas
- Townsites
- Major Roads

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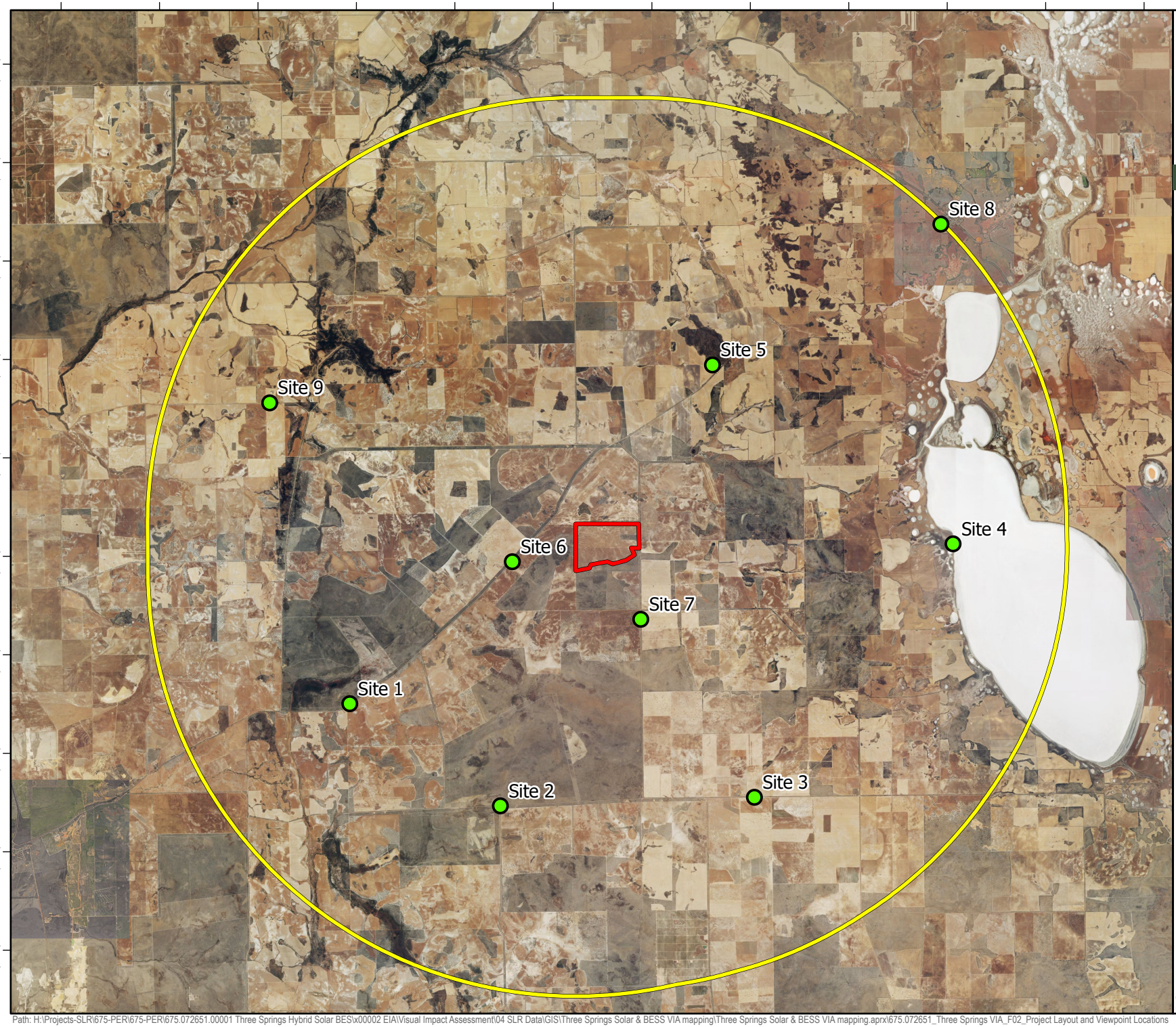
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Date Drawn:	7/04/2025
Drawn by:	JH
Reviewed by:	MD

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KILLAWARRA SOLAR & BESS

VIEWPOINT LOCATIONS

FIGURE 2

LEGEND

- Study Area
- Project Area
- Viewpoints

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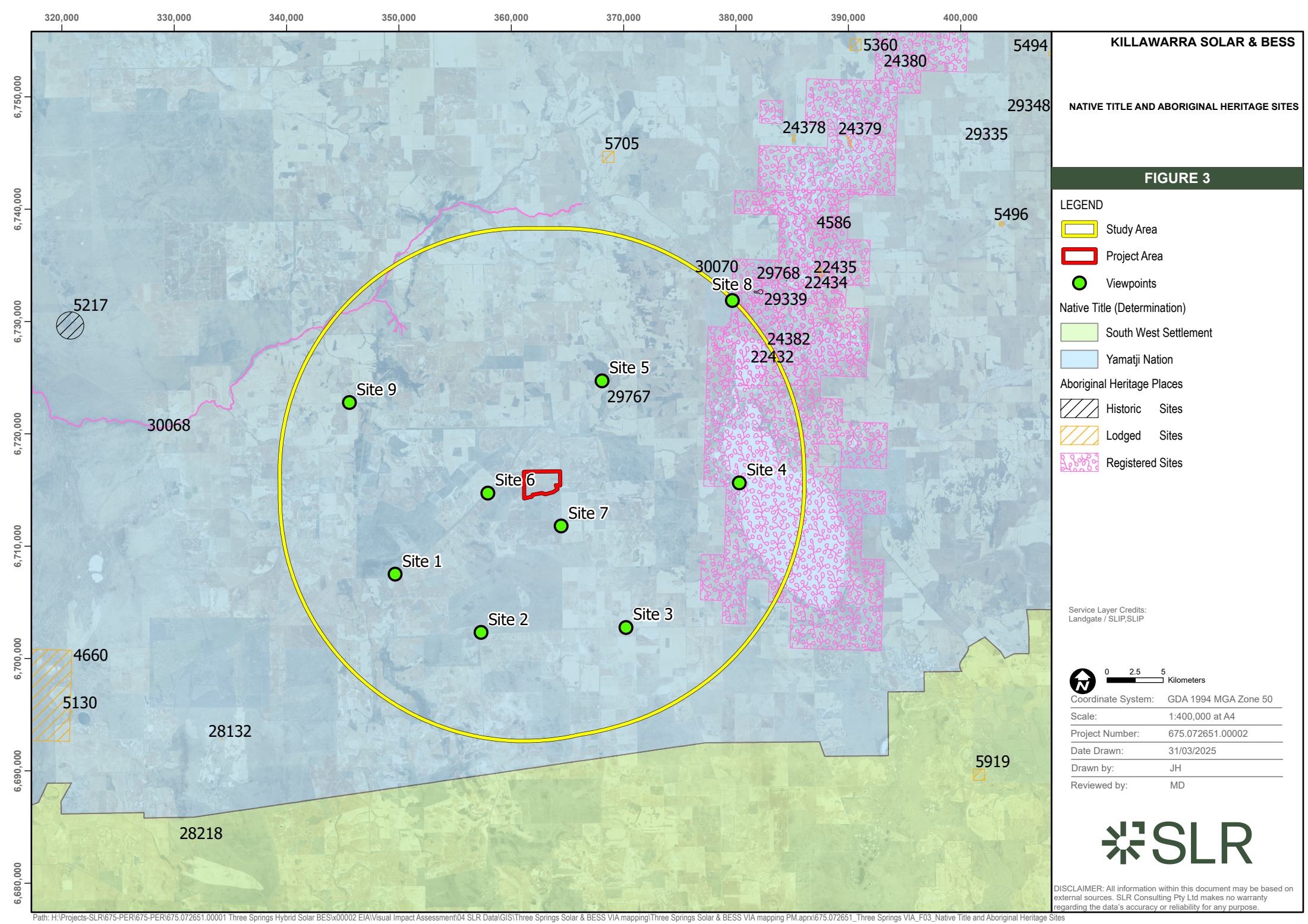
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KILLAWARRA SOLAR & BESS

NATIVE TITLE AND ABORIGINAL HERITAGE SITES

FIGURE 3

LEGEND

- Study Area
- Project Area
- Viewpoints

Native Title (Determination)

- South West Settlement
- Yamatji Nation

Aboriginal Heritage Places

- Historic Sites
- Lodged Sites
- Registered Sites

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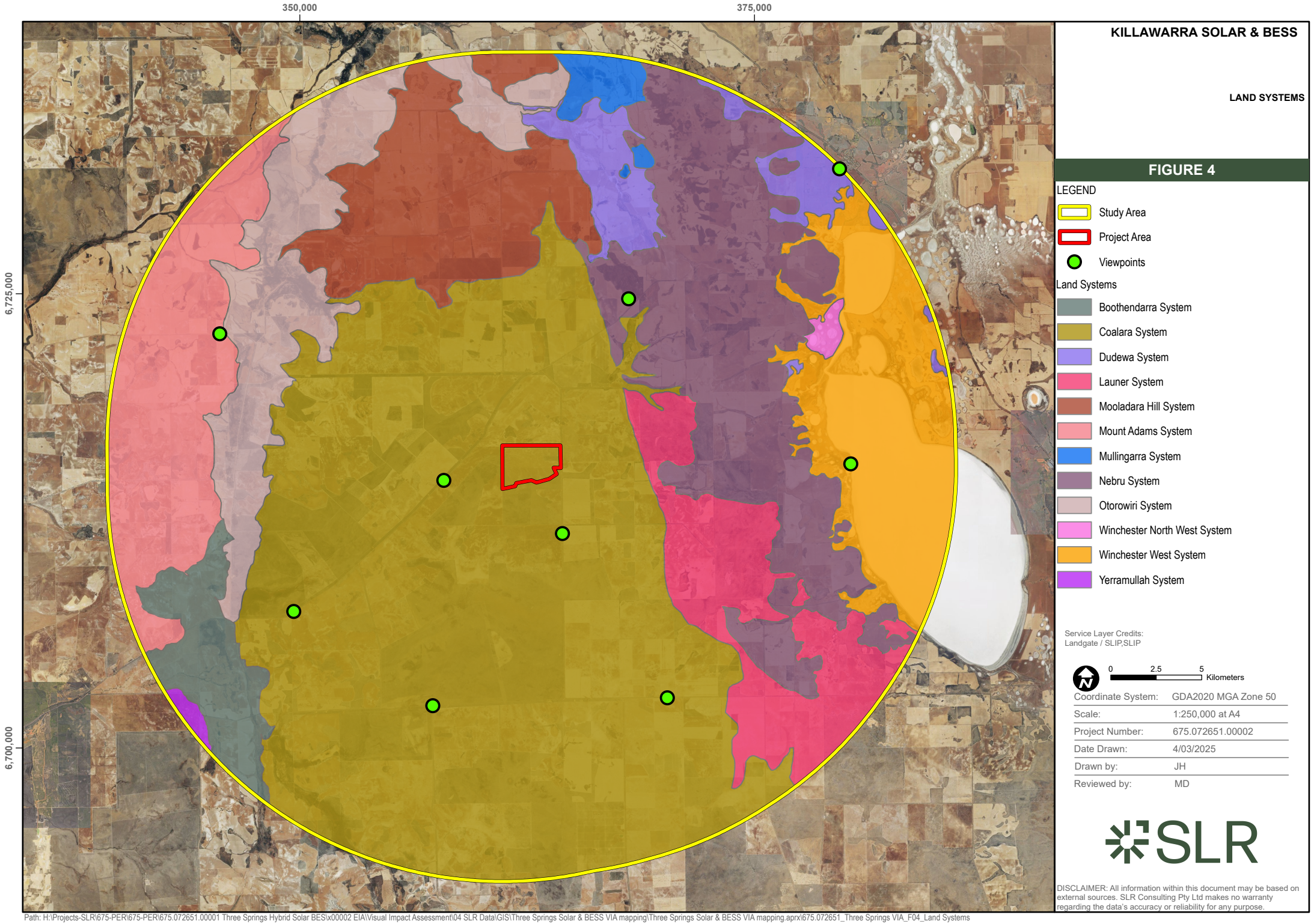
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KILLAWARRA SOLAR & BESS

LAND SYSTEMS

FIGURE 4

LEGEND

- Study Area
- Project Area
- Viewpoints

Land Systems

- Boothendarra System
- Coalara System
- Dudewa System
- Launer System
- Mooladara Hill System
- Mount Adams System
- Mullingarra System
- Nebru System
- Otorowiri System
- Winchester North West System
- Winchester West System
- Yerramullah System

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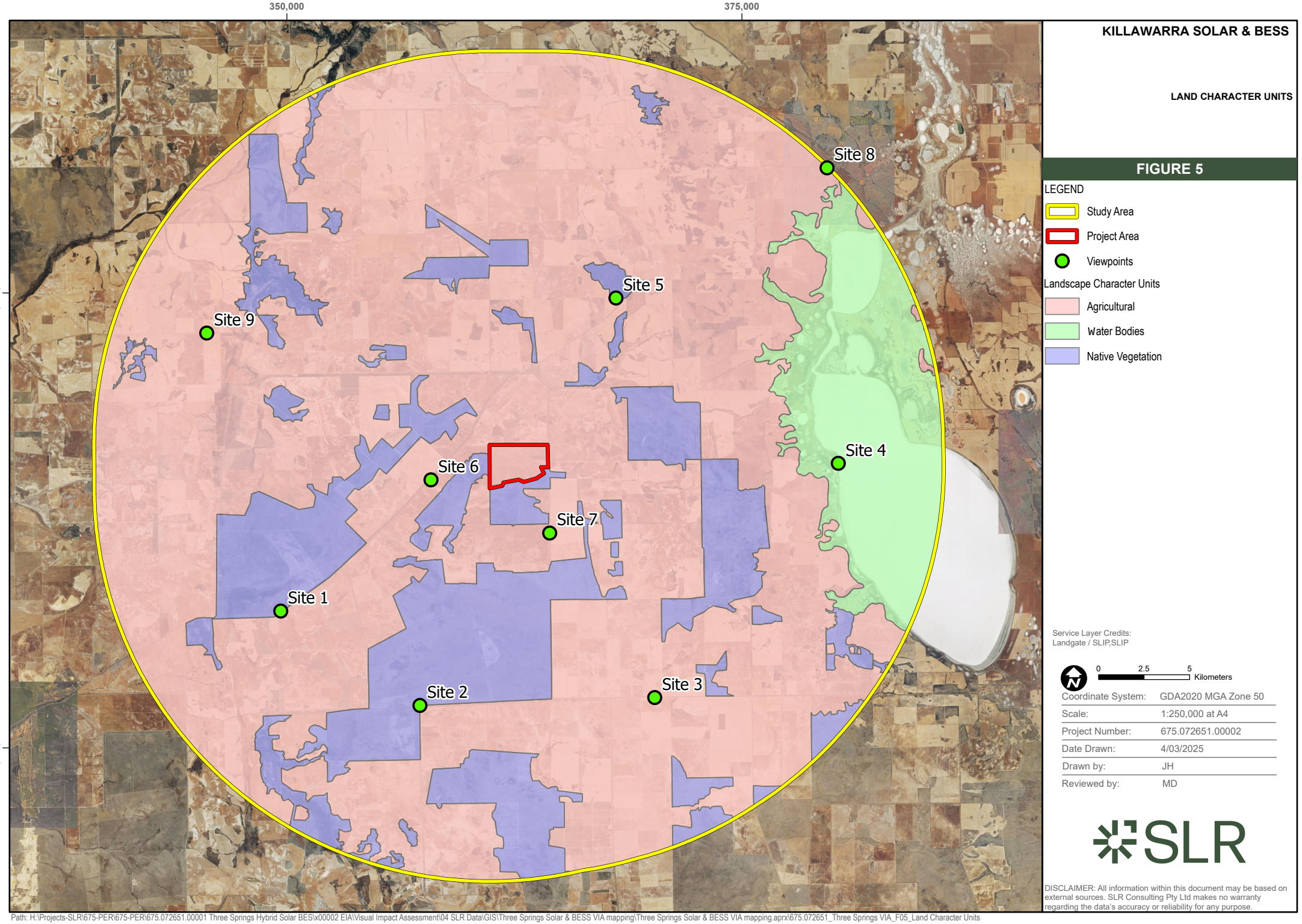
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KILLAWARRA SOLAR & BESS

LAND CHARACTER UNITS

FIGURE 5

LEGEND

- Study Area
- Project Area
- Viewpoints

Landscape Character Units

- Agricultural
- Water Bodies
- Native Vegetation

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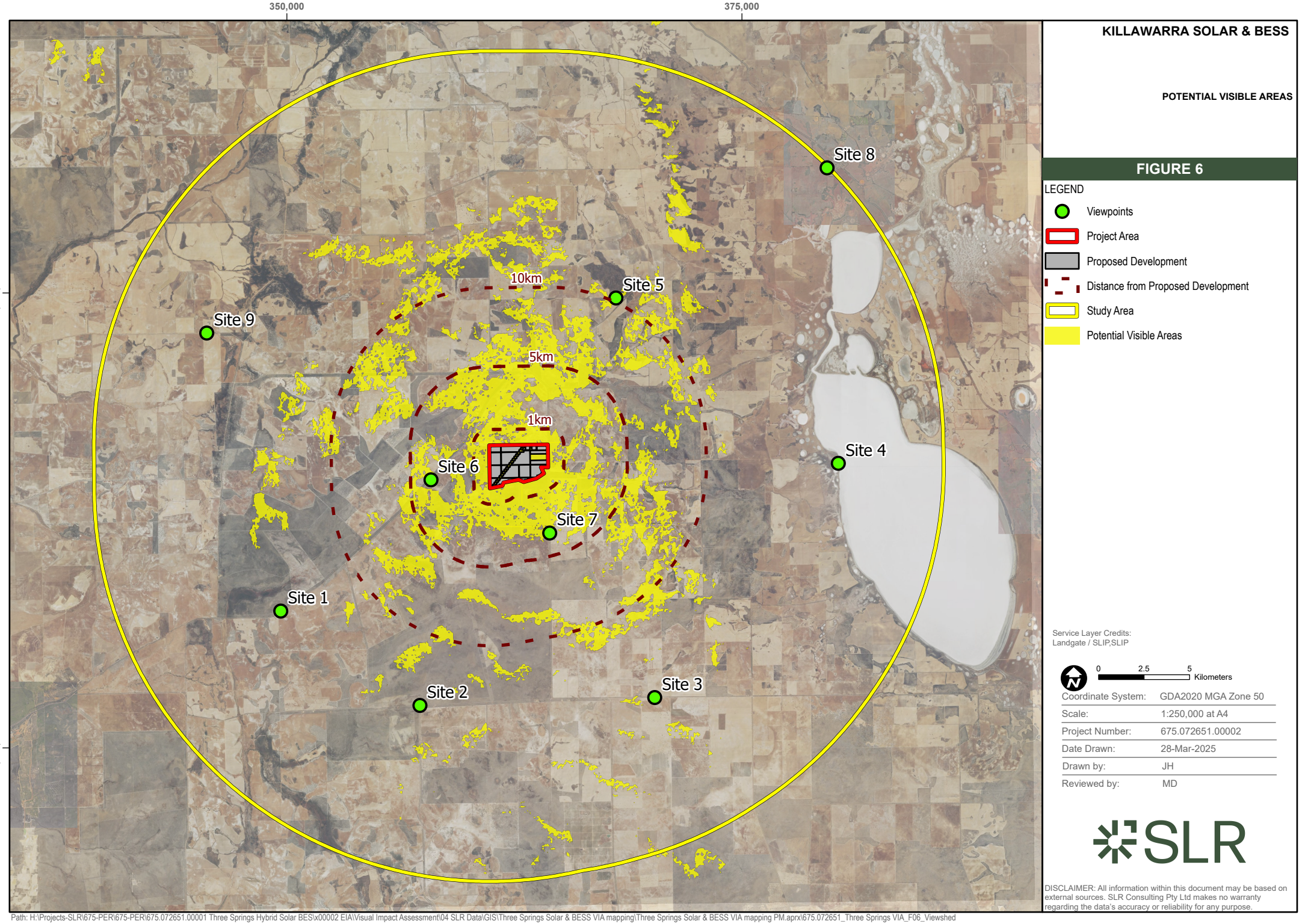
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KILLAWARRA SOLAR & BESS

POTENTIAL VISIBLE AREAS

FIGURE 6

LEGEND

- Viewpoints
- Project Area
- Proposed Development
- Distance from Proposed Development
- Study Area
- Potential Visible Areas

Service Layer Credits:
Landgate / SLIP,SLIP

0 2.5 5 Kilometers

Coordinate System:	GDA2020 MGA Zone 50
Scale:	1:250,000 at A4
Project Number:	675.072651.00002
Date Drawn:	28-Mar-2025
Drawn by:	JH
Reviewed by:	MD

SLR

DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

Path: H:\Projects-SLR\675-PER\675-PER\675.072651.00001 Three Springs Hybrid Solar BES\x00002 EIA\Visual Impact Assessment\04 SLR Data\GIS\Three Springs Solar & BESS VIA mapping\Three Springs Solar & BESS VIA mapping PM.aprx\675.072651_Three Springs VIA_F06_Viewshed

Appendix A Viewpoint Assessment: No Visibility

Visual Impact Assessment

Killawarra Solar Farm, Battery Energy Storage System (BESS) & Substation Project

Trina Solar (Australia) Pty Ltd

SLR Project No.: 675.072651.00001

11 April 2025

A.1 Site Descriptions for Sites Not Requiring Further Assessment

A.1.1 Site 2 – Tathra National Park

The view from site 2 is presented in Plate 1 and details are summarised in Table 1.



Plate 1: Site 2 – Tathra National Park

Table 1: Site 2 – Tathra National Park

Criteria	Characteristic
Location	Easting / Northing: 0357308/6702329
Date	15/01/2025
Site Code	Site 2
Viewpoint Setting	Tathra National Park
Local Vegetation Type	Native vegetation – trees, shrubs
Vegetation/Topography Screening Potential	100%
Foreground Elements	Road, signage, trees
Mid-Ground Elements	Track, hills, native vegetation
Background Elements	Hills with trees, mostly screened by mid-ground
Viewer Motion	110 km/h
Accessibility	High
Usage Type	Med/HIgh
Photography	Automatic exposure settings

Criteria	Characteristic
	Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: NE
After the field visit and in consideration of desktop assessment, Site 2 was rated as **high sensitivity** due to the site being a national park. The magnitude of change is **none** as the Project is not visible. It therefore has an impact rating of **none**.	

A.1.2 Site 3 – Carnamah-Eneabba Road

The view from Site 3 is presented in Plate 2 and details are summarised in Table 2.



Plate 2: Site 3 – Carnamah-Eneabba Road

Table 2: Site 3 – Carnamah-Eneabba Road

Criteria	Characteristic
Location	Easting / Northing: 0370208/6702763
Date	15/01/2025
Site Code	Site 3
Viewpoint Setting	Carnamah-Eneabba Road
Local Vegetation Type	Roadside trees and shrubs, crop
Vegetation/Topography Screening Potential	100%
Foreground Elements	Trees, gravel on the side of the road, crop / agricultural land

Criteria	Characteristic
Mid-Ground Elements	Paddock – wheat (agricultural land), trees
Background Elements	Trees, paddock (agricultural land), mostly screened by mid-ground
Viewer Motion	80 km/h
Accessibility	High
Usage Type	Medium/High
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: NW
After the field visit and in consideration of desktop assessment, Site 2 was rated as **medium sensitivity** due to being a commonly traversed road used by commuters and recreational users, the view is scenic and representative of local character but is not rare or unique. The magnitude of change is **none** as the Project is not visible. It therefore has an impact rating of **none**.	

A.1.3 Site 4 – Yarra Yarra Lakes

The view from Site 4 is presented in Plate 3 and details are summarised in Table 3.



Plate 3: Site 4 – Yarra Yarra Lakes

Table 3: Site 4 – Yarra Yarra Lakes

Criteria	Characteristic
Location	Easting / Northing: 0380296/6715636
Date	15/01/2025
Site Code	Site 4
Viewpoint Setting	Yarra Yarra Lakes
Local Vegetation Type	Salt lake shrubs, native vegetation / trees, weeds
Vegetation/Topography Screening Potential	100%
Foreground Elements	Trees, weeds, shrubs
Mid-Ground Elements	Trees, weeds, shrubs
Background Elements	Mostly screened by mid-ground
Viewer Motion	50 km/h
Accessibility	Medium
Usage Type	Low
Photography	Automatic exposure settings Canon SLR Camera (DS126741)

Criteria	Characteristic
	Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: W
After the field visit and in consideration of desktop assessment, Site 4 was rated as **high sensitivity** due to the site being within an Aboriginal heritage site – Irwin River (ACH-00018907). Site 4 is also a tourist location for wildflowers. The magnitude of change is **none** as the Project is not visible. It therefore has an impact rating of **none**.	

A.1.4 Site 8 – Three Springs Town

The view from Site 8 is presented in Plate 4 and details are summarised in Table 4.



Plate 4: Three Springs Town

Table 4: Three Springs Town

Criteria	Characteristic
Location	Easting / Northing:
Date	14/01/2025
Site Code	Site 8
Viewpoint Setting	Three Springs
Local Vegetation Type	Crop – wheat, roadside trees
Vegetation/Topography Screening Potential	100%
Foreground Elements	Roadside trees, crop, fence
Mid-Ground Elements	Power lines and poles, crop, trees

Criteria	Characteristic
Background Elements	Power lines and poles, crop, trees, mostly screened by midground
Viewer Motion	50 km/h
Accessibility	High
Usage Type	Medium/High
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: SW
After the field visit and in consideration of desktop assessment, Site 8 was rated as **high sensitivity** due to the site being a Town Centre and viewers include tourists, workers and residents. The magnitude of change is **none** as the Project is not visible. It therefore has an impact rating of **none**.	

A.1.5 Site 9 – Frog Valley

The view from Site 9 is presented in Plate 5 and details are summarised in Table 5.

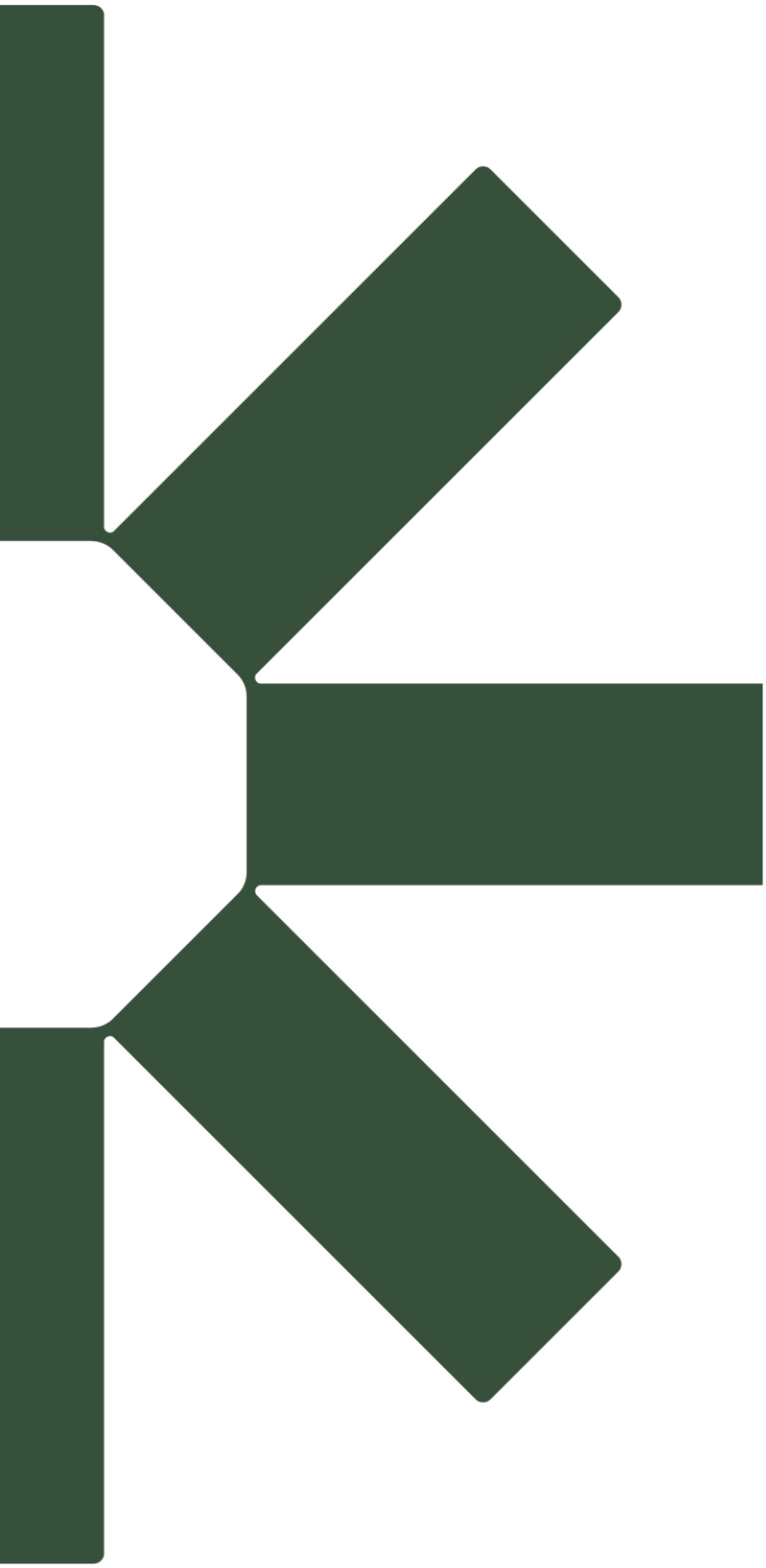


Plate 5: Site 9 – Frog Valley

Table 5: Site 9 – Frog Valley

Criteria	Characteristic
Location	Easting / Northing: 0340388/6832790
Date	14/01/2025

Criteria	Characteristic
Site Code	Site 9
Viewpoint Setting	Frog Valley
Local Vegetation Type	Roadside native vegetation, crop – wheat
Vegetation/Topography Screening Potential	100%
Foreground Elements	Gravel road
Mid-Ground Elements	Crop, native vegetation, low-range hills
Background Elements	Crop, native vegetation, low-range hills
Viewer Motion	80 km/h
Accessibility	High
Usage Type	Medium
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: SE
After the field visit and in consideration of desktop assessment, Site 9 was rated as **medium sensitivity** due to the site being a residential/ agricultural development, expected to have commuters, the view is scenic and representative of local character but is not rare or unique. The magnitude of change is **none** as the Project is not visible. It therefore has an impact rating of **none**.	



Making Sustainability Happen

Appendix G – Flora and Fauna Assessment

Technical Memorandum

To:	Edward Wang	**From:**	Sacha Ruoss and Lukas Geidans
Company:	Trina Solar		**SLR Consulting Australia**
cc:	Genelle Abolis	**Date:**	1 April 2025
		Project No.	675.072651.00003

RE: Killawarra Solar and BESS Project, Western Australia
Flora and Fauna Assessment

Confidentiality
This document is confidential and may contain legally privileged information. If you are not a named or authorised recipient, you must not read, copy, distribute or act in reliance on it. If you have received this document in error, please notify us immediately and return the document by mail.

1.0 Introduction

Trina Solar commissioned SLR Consulting Australia Pty Ltd to undertake a desktop assessment, and flora and fauna site visit for the proposed PV solar farm, Battery Energy Storage System (BESS) and substation project located within the Shire of Three Springs in Western Australia. The 599 ha Survey Area is located at Lot 10896 Turkey Flat Road, Kadathinni approximately 24 km southwest of Three Springs (**Map 1**).

The objective of the survey was to identify key flora, vegetation, and fauna values within the Survey Area as part of the environmental impact assessment process. This report presents the findings of the surveys.

2.0 Scope of Work

The specific objectives of the assessment were:

- A desktop assessment including relevant database searches, and spatial information available from public sources and summarise existing records of flora, vegetation, and fauna in the vicinity of the Survey Area.
- A reconnaissance level flora and vegetation survey within the Survey Area.
- A basic fauna survey and black cockatoo habitat assessment within the Survey Area.
- Assessment of any potential listed species under State and Federal environmental legislation, a list of the conservation significant species that have been recorded within 10 km of the site according to the threatened and priority flora, fauna, and ecological community DBCA database and the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Protected Matters Search Tool.
- Preparation of a combined technical biological memorandum containing sufficient baseline information to inform future planning to avoid native flora, vegetation, fauna habitat, and potential black cockatoo habitat/breeding trees when planning the Project.

3.0 Methods

3.1 Desktop Study

3.1.1 Database Searches

Database searches were undertaken to compile a list of flora and fauna known to occur in the Desktop Study Area and identify significant flora, fauna, and ecological communities with potential to occur within the Survey Area. Flora and Fauna database search results are displayed in **Map 2a** and **Map 2b** while black cockatoo search results are displayed in **Map 3**.

Table 1: Database Search Details

Database name	Date received	Search target	Buffer around the Survey Area
Threatened and Priority Ecological Communities database search (DBCA, 2024b)	04/09/2024	TECs and PECs	20 km
Threatened and Priority Flora (TPFL) database search (DBCA, 2024d)	04/09/2024	Threatened and Priority flora	20 km
Western Australian Herbarium Flora database search (DBCA, 2024e)	04/09/2024	Threatened and Priority flora	20 km
Threatened and Priority Fauna including black cockatoo-specific database search (DBCA, 2024c)	05/09/2024	Threatened and Priority fauna	50 km
Protected Matters Search Tool (PMST) (DCCEEW, 2024)	01/11/2024	Threatened flora, fauna, and ecological communities	10 km
NatureMap (DBCA, 2024a)	08/11/24	Flora and fauna	20 km

3.1.2 Likelihood of Occurrence

Significant flora and fauna taxa identified during the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area before and after the field survey. The assessment used the likelihood of occurrence criteria presented in **Appendix B** and **Appendix G.**

Taxa listed as Marine only under the EPBC Act were not considered to be significant taxa because the Marine listing does not constitute MNES under the EPBC Act. Additionally, erroneous records (i.e. records that occur well outside a taxon's known distribution) were excluded from consideration. Only taxa that have been recorded within the Survey Area or were assessed as having a high or medium likelihood of occurrence are discussed in detail.

Table 2: Likelihood of Occurrence Criteria

Rank	Criteria
Recorded	The taxon was recorded within the Survey Area during the current survey.
Previously Recorded	The taxon has been previously recorded within the Survey Area according to database searches or existing literature.

Rank	Criteria
High (Likely to occur)	Suitable habitat is present within the Survey Area, and, for flora, the taxon has been recorded within 5 km of the Survey Area or, for fauna, the taxon has been recorded within the Desktop Study Area more than once in the last 15 years.
Medium (May occur)	There are existing records of the taxon within the Desktop Study Area, however suitable habitat within the Survey Area is marginal or limited in extent or, for fauna, the taxon has not been recorded within the Desktop Study Area in the last 15 years.
Low (Unlikely to occur)	Suitable habitat is not present within the Survey Area, or the taxon is very infrequently recorded in the locality despite reasonable previous search effort, or the taxon is believed to be extinct or locally extinct.

3.2 Flora

The flora and vegetation field survey was undertaken by Principal Botanists Narelle Whittington, Sacha Ruoss and Senior Botanist Louisa Cockram on 10th September 2024. A handheld Fulcrum mobile data collection device was used to record data and mapping notes; opportunistic flora collections when significant flora, Declared Pests (DPs), or WoNS were encountered, and photographs were also taken where required.

Vegetation types were described based on their structure and species composition, and condition was assessed according to the Southwest vegetation condition scale (EPA, 2016). Broad vegetation and condition mapping was conducted in the field, with boundaries delineated over aerial photography, at a scale of 1:2,000. Broad vegetation units were refined based on taxonomic identification of flora collections, and mapping notes taken during the field survey. Vegetation condition mapping was refined based on site data and mapping notes. Finalised polygons were digitised and produced as electronic mapping data using GIS software.

3.2.1 Establishment of Flora Sites

Indicative site selection was undertaken prior to the survey based on aerial photography and available literature. Two sites were established at the two proposed access sites. These are located within the Turkey Flat Road reserve on the eastern boundary of the site. Flora site locations were recorded using a GPS-enabled handheld device, with points recorded at each corner of a quadrat.

The following information was recorded at each flora site:

- Site code.
- Date and personnel.
- Landform and soil description.
- Relevant site descriptors including, slope, aspect, litter cover, bare ground cover, and fire history.
- Inventory of vascular flora including the approximate average height and percentage foliar cover for each taxon.
- Vegetation description in accordance with the National Vegetation Information System (NVIS) Level 5 ‘association’ whereby the dominant growth form, height, cover, and species (three species) for the three traditional strata (upper, mid, and ground) are described.

- Vegetation condition in accordance with the South-West and Interzone Botanical Provinces vegetation condition scale.
- Evidence of disturbance (for example clearing, rubbish, feral animals, weed incursion, and evidence of feral animals and dieback) where present.
- Photograph of the vegetation occurring within the site.

A total of two flora sites were established within the Survey Area. Flora site locations are shown on **Map 1**.

3.2.2 Opportunistic Flora

Any flora taxa observed opportunistically around the flora sites or while traversing on foot within the Survey Area were also recorded. Where populations of significant flora taxa, Declared Pests (DPs) or Weeds of National Significance (WoNS) were encountered, a GPS location and a count of the individuals present was recorded.

3.2.3 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected for identification using resources of the Western Australian Herbarium (WAH).

The finalised species list was checked against FloraBase (WAH, 2024) to determine the conservation status and known distribution of each taxon. Introduced species were compared against the current Biosecurity and Agriculture Management (BAM) Act 2007 Declared Plants list the WoNS list to determine their control status (DPIRD, 2024)

3.2.4 Vegetation and Condition Mapping

Broad vegetation and condition mapping was conducted in the field, with boundaries delineated over aerial photography, at a scale of 1:2000. Broad vegetation units were refined based on taxonomic identification of flora collections, dominant species within quadrats and mapping notes taken during the field survey. Vegetation condition mapping was refined based on site data and mapping notes. Finalised polygons were digitised and produced as electronic mapping data using GIS software.

3.3 Fauna

3.3.1 Habitat Assessment and Mapping

Habitat assessments were undertaken in representative areas of fauna habitat within the Survey Areas to record habitat values. Where possible, at least one habitat assessment was recorded within each habitat type.

The following information was collected at each habitat assessment locations using a GPS-enabled handheld device:

- Site photo.
- Landform.
- Soil type and colour.
- Rock types, surface stone cover, and size classes.
- Key habitat and microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, and water sources.
- Habitat quality, fire history, and evidence of disturbance.

- General description of vegetation structure.

Fauna habitat mapping was based on a combination of field observations, habitat assessment data, aerial imagery, and, if available, vegetation type mapping. Polygons were digitised using GIS software.

3.3.2 Opportunistic Observations

Opportunistic observations of fauna were recorded throughout the Survey Area, including primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings, remains).

3.3.3 Black Cockatoo Habitat Assessment

A black cockatoo habitat assessment was undertaken to assess breeding, night roosting, and foraging habitat values for three threatened black cockatoo taxa, the Carnaby's Cockatoo (*Zanda latirostris*), Baudin's Cockatoo (*Zanda baudinii*), and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*).

3.3.3.1 Breeding Habitat

Breeding habitat was assessed based on the number and location of trees that meet the following criteria:

- Tree taxa is known to form suitable hollows, including trees endemic to southwest Western Australia such as Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), Tuart (*E. gomphocephala*), Karri (*E. diversicolor*), Wandoo (*E. wandoo*), and Salmon Gum (*E. salmonophloia*), and non-endemic *Eucalyptus* and *Corymbia* trees.
- Tree is of a suitable diameter at breast height (DBH) to develop a nest hollow, which is greater than 500 mm for most tree species, regardless of the presence or absence of hollows. DBH was measured approximately 1.3 m above the ground, except in instances where trees had swelling or forking at breast height, in which case the diameter measurement was taken just above the swelling or forking. In instances where trees had multiple stems at breast height, the stem with the largest diameter was recorded.
- Tree contains hollows (observed from the ground) with an estimated opening diameter of greater than 100 mm (Saunders, Mawson and Dawson, 2014).

If observed, trees that met the above criteria were recorded using a GPS-enabled handheld device. Recorded trees were categorised as potential, suitable, or known nesting trees as adapted from the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022) and given a ranking of 1 – 5 based on the black cockatoo nesting and potential nesting tree ranking system developed by Bamford Consulting Ecologists:

- Known nesting tree:
  1. Active nest observed. Adult or immature bird seen entering or emerging from hollow.
- Suitable nesting tree:
  2. Hollow of suitable size and angle (i.e. near-vertical) visible with chew marks around entrance.

3. Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of greater than 10 m).

- Potential nesting tree:

4. Tree with large hollows or broken branches that might contain large hollows, but hollows or potential hollows are not vertical or near vertical; thus, a tree with or likely to have hollows of sufficient size but not to have hollows of the angle preferred by black cockatoos.
5. Tree lacking large hollows or broken branches that might have large hollows, a tree with intact branches and a spreading crown.

3.3.3.2 Night Roosting Habitat

Potential black cockatoo roosting habitat consists of tall trees, particularly when they occur near water sources (for Carnaby's Cockatoo and Baudin's Cockatoo) or on the edges of large forests (for Forest Red-tailed Black Cockatoo) (DAWE, 2022). Areas containing tall trees suitable for black cockatoo roosting were identified and recorded. If observed, evidence of black cockatoo roosting, which typically consists of large amounts of scat with occasional feathers at the base of trees, was recorded.

3.3.3.3 Foraging Habitat

Foraging habitat was assessed based on the presence and coverage of known foraging plants for black cockatoos as outlined in the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022). Foraging habitat was mapped and classified using the Foraging Habitat Scoring Tool (DAWE, 2022) and Habitat Scoring System (DCCEEW, 2023). For the purposes of referral to the Minister for the Environment, the Foraging Habitat Scoring Tool is to be applied once to the entire impact area of a proposed action, even if there is more than one type of foraging habitat (DAWE, 2022), however for the purposes of this report a foraging habitat score has been calculated for each habitat type.

If observed, evidence of black cockatoo foraging, including direct observations of foraging and chewed foraging material (e.g. nuts or cones) was recorded.

3.3.4 Identification and Taxonomy

Terrestrial vertebrate fauna taxa were identified in the field and released on site. Where there was doubt on a species name (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. Taxonomy and nomenclature in this report follows the Checklist of the Terrestrial Vertebrate Fauna of Western Australia (WAM, 2024) where relevant.

3.4 Climate

The closest long-term Bureau of Meteorology (BoM) weather station with a complete temperature dataset is Carnamah Weather Station (Station 8025), located approximately 30 km east of the Survey Area. The closest long-term BoM weather station with a complete rainfall dataset is Three Springs Weather Station (Station 8121), located approximately 20 km northeast of the Survey Area.

The long-term (1940 to 2024) mean minimum temperature for Carnamah Weather Station ranges from 7.3˚C (July and August) to 19.2˚C (February) and the long-term mean maximum temperature ranges from 18.1˚C (July) to 36.2˚C (January) (**Figure 1**) (BoM, 2024).

The Three Springs Weather Station recorded 349.0 mm of rainfall in the 12 months prior to the survey (September 2023 to August 2024), which is 29.0 mm below the long-term (1907 to 2024) average of 378.0 mm (BoM, 2024). In the three months prior to the survey (June to August 2024), 274.0 mm of rainfall was recorded, which is 80.0 mm above the long-term average of 194.0 mm for the same period (BoM, 2024). The recorded mean temperature for November 2023 was 5.9 ˚C (maximum) and 3.3 ˚C (minimum) above the long-term average.

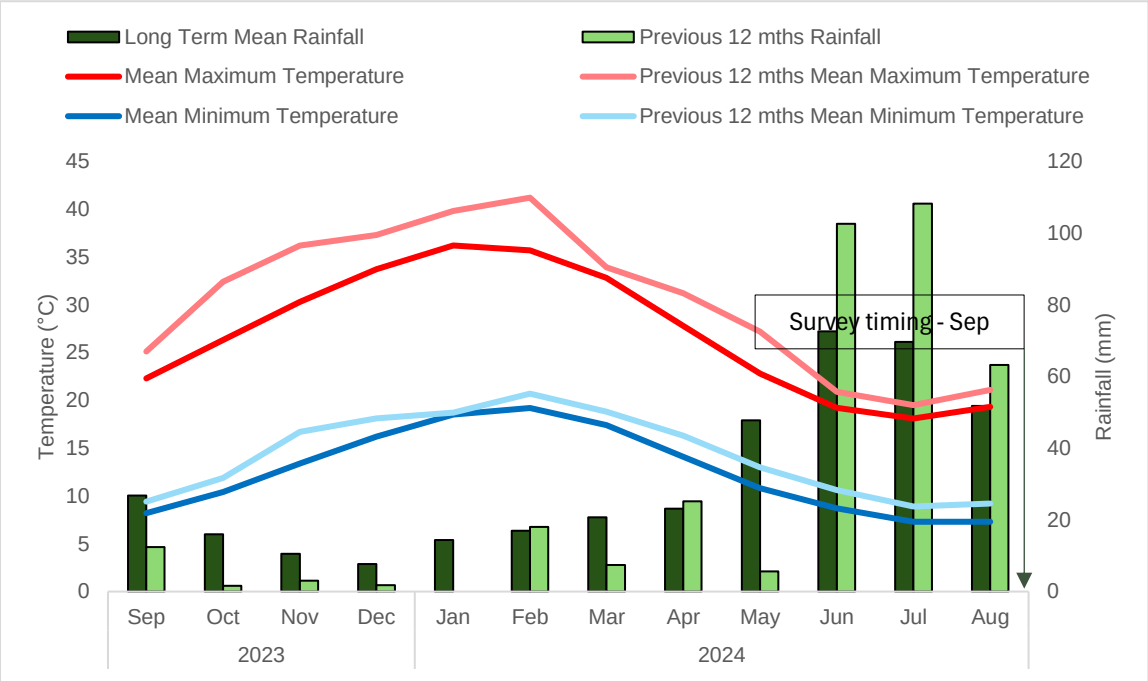


Figure 1: Climate summary of Carnamah (Temperature) and Three Springs (Rainfall) Weather Station

4.0 Results

4.1 Limitations

Limitations and constraints of the flora, vegetation, and fauna survey are detailed below in **Table 3**.

Table 3: Limitations and constraints associated with the survey

Variable	Degree of limitation	Potential constraints on survey outcomes
Availability of data and information	None	Sufficient data and information, including regional and local contextual information, was available to complete the scope of the survey.
Competency and experience of the survey team	None	The survey was undertaken by a team with extensive experience undertaking similar scopes within the Geraldton Sandplain bioregion. • Principle Botanist, Narelle Whittington – 20 years' experience • Principle Botanist, Sacha Ruoss – 12 years' experience • Senior Botanist, Louisa Cockram – 12 years' experience

Variable	Degree of limitation	Potential constraints on survey outcomes
The proportion of flora and fauna identified, recorded, or collected	None	Of the 77 flora taxa recorded, three specimens (3.9%), could not be identified to species level because they were sterile at the time of the survey. The unidentified flora specimens were not analogous to significant flora taxa. All fauna taxa were identified to species level and was therefore not a limitation.
Scope of the survey	None	The reconnaissance flora and vegetation survey was undertaken in accordance with EPA technical guidance (EPA, 2016). The scope of the survey was limited to vascular plants and terrestrial vertebrate fauna. No further exclusions were made within these groups.
Adequacy of the survey intensity and proportion of survey achieved	None	Additional survey effort may yield additional flora and fauna taxa; however, sufficient time and effort was allocated to the survey given the size and complexity of the Survey Area and the expected level of survey intensity. This survey was undertaken within the optimal survey period for flora and vegetation in the Sout-West Botanical Province.
Access problems	None	The Survey Area was sufficiently accessed by vehicle and on foot.
Timing, weather, and season	None	The recommended primary survey period for flora and vegetation within the South-West Botanical Province occurs in Spring (September to November). The reconnaissance flora and vegetation survey (10 September) occurred within the primary survey period. Rainfall prior to the field survey was above average, with 80.0 mm above the long-term average of 194.0 mm (June to August 2024). The recommended primary survey periods for the Geraldton Sandplains broad climatic region for fauna are: • Amphibians – May-August (autumn-winter breeders) and November-December (summer breeders) • Birds – September-December and November-March • Mammals – September-December • Reptiles – October-December and February-March However, the level of survey (basic fauna and black cockatoo habitat assessment) is not constrained by survey timing.
Disturbance that may have affected the results of survey	None	Areas of disturbance associated with agricultural activities and weed invasion were present within the Survey Area but were not a limitation on the results of the survey.
Problems with data and analysis, including sampling biases	None	Survey effort for significant flora and fauna taxa was concentrated in preferred habitats. This may introduce a bias where the use of non-preferred habitat is underrepresented, however, this is not considered a limitation on the survey outcomes.

4.2 Flora and Vegetation

4.2.1 Database Searches

Twenty-six Threatened flora species pursuant to the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* and/or gazetted as Threatened pursuant to the *Biodiversity Conservation* (BC) *Act 2016* had the potential to be recorded during the survey (**Map 2b**, **Appendix B**). These species were from 11 families and 19 genera. The most abundant genera were *Acacia* and *Eucalyptus*, (three taxa). The most diverse families were Fabaceae (six taxa), Myrtaceae (six taxa) and Lamiaceae (three taxa). Zero taxa were recorded as Critically Endangered, Twenty-two as Endangered and four as Vulnerable.

Ninety DBCA listed Priority species had the potential to occur within the Survey Area (**Map 2b**, **Appendix B**). These species were from 22 families and 43 genera. The most abundant genera were *Banksia* (eight taxa), *Stylidium* and *Verticordia*, (seven taxa). The most diverse families were Myrtaceae (twenty-three taxa) and Proteaceae (twenty-one taxa). Ten taxa were recorded as Priority 1, Nineteen as Priority 2, Forty-three and Priority 3 and eighteen as Priority 4.

4.2.2 Likelihood of Occurrence

The pre-survey likelihood of occurrence identified that of the 116 significant flora taxa identified by the desktop assessment:

- No species had previously been recorded within the Survey Area.
- Five species were considered to have a high likelihood of occurrence within the Survey Area (*Stylidium* sp. Three Springs (J.A. Wege & C. Wilkins JAW 600) (P2), *Calytrix ecalycata* subsp. *ecalycata* (P3), *Grevillea erinacea* (P3), *Lechenaultia juncea* (P3) and *Lepidobolus densus* (P4)).
- 25 species were considered to have a medium likelihood of occurrence within the Survey Area.
- 86 species were considered to have a low likelihood of occurrence within the Survey Area.

Following the field survey, the likelihood of occurrence assessment identified that:

- One significant flora taxon was recorded within the Survey Area (*Grevillea erinacea* (P3)).
- No species had a high likelihood of occurrence within the Survey Area.
- 15 species were considered to have a medium likelihood of occurrence within the Survey Area.
- 100 species were considered to have a low likelihood of occurrence within the Survey Area.

The likelihood of occurrence assessment is provided in **Appendix B**.

4.2.3 Floristic Composition

The field survey recorded a total of 77 taxa from 39 genera across 17 families (**Appendix C**). The most abundant genera were *Austrostipa*, *Banksia, Grevillea* and *Trachymene* (two taxa). The most diverse families were Asteraceae (nine taxa), Myrtaceae (seven taxa) and Poaceae (six taxa).

4.2.4 Significant Flora

No Threatened flora species pursuant to the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* and/or gazetted as Threatened pursuant to the *Biodiversity Conservation* (BC) *Act 2016* were recorded during the survey. One DBCA listed Priority species, *Grevillea erinacea* (P3), was recorded within the Survey Area. The species was found at five locations totalling 11 plants (**Map 4**,**Table 4**). One of these locations is located within the Survey Area, while the remainder are located on remnant roadside vegetation along Turkey Flat Road.

Grevillea erinacea (P3) is a spindly, prickly, sparingly branched shrub from 0.6 to 1.8 m high. The species has green-white-cream flowers, from July to December (**Photo 1**). It favours white, grey or yellow sand, often where laterite is also present. The WAH has 37 specimens lodged, with records between Geraldton and Warradarge within the Geraldton Sandplains and Avon Wheatbelt IBRA regions (DBCA, 2024b).

Table 4: Location of Conservation Significant Flora

Species	Conservation Code	Location		Number of Plants
		Latitude	Longitude	
Grevillea erinacea	P3	-29.6840308	115.5984716	1
Grevillea erinacea	P3	-29.675605	115.5648567	4
Grevillea erinacea	P3	-29.6797171	115.5984782	1
Grevillea erinacea	P3	-29.673796	115.5984161	3
Grevillea erinacea	P3	-29.6737967	115.5984167	2



Photo 1: *Grevillea erinacea* (P3) – (Source: SLR Consulting)

4.2.5 Introduced Flora

A total of 14 introduced taxa were recorded within the Survey Area, representing 18.4 % of the total taxa recorded (**Appendix C**). No introduced taxa recorded are listed as a WoNS. No introduced taxa were listed as a Declared Pests under the BAM Act.

The majority of the Survey Area (99.85 %) consists of pasture therefore introduced flora were common throughout the Survey Area, no attempt was made to capture every introduced taxa encountered, due to the highly modified setting and project scope.

4.2.6 Vegetation Types

The Survey Area had minimal intact vegetation, one native vegetation type (EtXa) was described and mapped from one landform **(Map 4,Table 5)**. The vegetation type described was represented by a native overstorey and mid-storey on gently undulating cream sand plains. The lower strata consisted of mixed native and introduced species. This vegetation type is described as:

- Low open woodand of *Eucalyptus todtiana* and *Xylomelum angustifolium* over a tall open shrubland of *Leptospermopsis oligandra*, *Banksia sphaerocarpa* and *Calothamnus quadrifidus* over a tall open tussock grassland of *Ecdeiocolea monostachya*, **Ehrarta longiflora* and **Avena barbata.*

Ninety nine percent (598.29 ha) of the Survey Area is cleared land (**Table 5**), while other vegetation in the Survey Area consisted of remnant isolated trees and shrubs. One tree, *Eucalyptus todtiana* was recorded as potential fauna habitat (Discussed in 4.3.5.2).

Detailed site sheets for each relevé are provided in **Appendix D**.

Table 5: Summary of Vegetation Types within the Survey Area

Vegetation type	Area and percentage cover in Survey Area	Sites
EtXa	0.26 ha (0.04%)	TSNR1, TSNR2
Isolated Trees	0.67 ha (0.11%)	-
Cleared	598.29 (99.85)	-

4.2.7 Vegetation Condition

Vegetation condition within the Survey Area ranged from Very Good to Completely Degraded. The majority of the Survey Area was recorded as Completely Degraded (99.96 %) (**Map 5,Table 6**).

Evidence of disturbance was primarily associated with historically cleared land used for agricultural purposes, high levels of weed invasion, infrastructure, and cattle grazing.

Table 6: Summary of vegetation condition within the Survey Area

Vegetation condition	Area and percentage cover in Survey Area
Very Good	0.26 ha (0.04%)
Completely Degraded	598.96 ha (99.96%)

4.3 Fauna

4.3.1 Desktop Assessment

The database searches and literature review identified 130 terrestrial vertebrate fauna taxa occurring within the Desktop Study Area, comprising:

- 108 birds, of which 19 are significant.
- 15 mammals, of which five are significant.
- seven reptiles, of which three are significant.

A complete list of fauna taxa recorded within the Desktop Study Area is presented in **Appendix E**, and database search results are displayed in **Map 2a**.

4.3.1.1 Black Cockatoo Desktop Assessment

The Survey Area occurs within the modelled distribution of the Carnaby's Cockatoo, however, falls outside the modelled distribution of the Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo (DAWE, 2022). The DBCA database search results are presented in **Map 3** and summarised below:

- A total of 192 black cockatoo records were identified, comprising 133 Carnaby's Cockatoo records, two Forest Red-tailed Black Cockatoo records, and 57 White-tailed Black Cockatoo (i.e. Baudin's Cockatoo or Carnaby's Cockatoo) records.
- Carnaby's Cockatoo have been recorded 8.5 km east of the Survey Area in 2014, Forest Red-tailed Black Cockatoo have been recorded 27.6 km east of the Survey Area in 1966, and White-tailed Black Cockatoo (i.e. Baudin's Cockatoo or Carnaby's Cockatoo) have been recorded 16 km southwest of the Survey Area in 1979.
- Five confirmed White-tailed Black Cockatoo (i.e. Baudin's Cockatoo or Carnaby's Cockatoo) breeding sites occur within the Desktop Study Area, the closest of which is 8.7 km north of the Survey Area. All occurred in natural hollows.
- No confirmed or potential Forest Red-tailed Black Cockatoo breeding sites occur within the Desktop Study Area.
- Six black cockatoo roost sites occur within the Desktop Study Area, of which five recorded activity since 2010. The nearest roost site is approximately 23.8 km north of the Survey Area.

4.3.2 Fauna Habitats

Two fauna habitats (excluding cleared areas) were identified and mapped within the Survey Area. Fauna habitats are presented in **Map 6**, described below in **Table 7**, and site sheets for each habitat assessment are provided in **Appendix F**. Small discrepancies in fauna habitat extents (i.e., not adding up to the exact area extent of the Survey Area) are due to rounding.

Table 7: Fauna habitats recorded within the Survey Area

Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Native Roadside Vegetation	0.26 ha, 0.04%	Low open woodland of *Eucalyptus todtiana* and *Xylomelum angustifolium* over *Banksia sphaerocarpa* and *Calothamnus quadrifidus* over a tall open tussock grassland. Microhabitats include a sandy substrate, woody debris, and leaf litter. This habitat is in very good condition with some disturbance from weeds, litter and infrastructure. No evidence of recent fire was identified. This habitat may be suitable for use by the Carnaby's Cockatoo due to the presence of preferred foraging species and the taller eucalypts that may support nesting or roosting. Dead trees present within this habitat may provide shelter for the Western Spiny-tailed Skink.	
Isolated Trees	0.67 ha, 0.11%	Isolated native and non-native trees lacking mid and understorey. Microhabitats include woody debris and with some limited leaf cover. This habitat is in poor condition with disturbances from weeds, infrastructure and clearing. No evidence of recent fire was identified. This habitat may be suitable for use by the Carnaby's Cockatoo for roosting. Some trees have the potential to develop hollows and may therefore be used for nesting in the future. Dead trees may provide shelter for the Western Spiny-tailed Skink.	
Cleared	598.29 ha, 99.85%	Cleared land for existing tracks/roads. Low/negligible fauna habitat value.	
Total	599.22		

4.3.3 Fauna Records

The fauna survey recorded a total of eight fauna taxa from eight families, all of which were birds. No amphibians, mammals, or reptiles were recorded. Recorded fauna are presented in **Table 8** and displayed in **Map 6**.

Table 8: Recorded Fauna

Family	Scientific Name	Common Name	State	Federal	Abundance	Observation Method
Accipitridae	*Aquila audax*	Wedge-tailed Eagle	-	-	1	Sighting
Cacatuidae	*Eolophus roseicapilla*	Galah	-	-	2	Sighting
Corvidae	*Corvus coronoides*	Australian Raven	-	-	3	Sighting
Falconidae	*Falco cenchroides*	Nankeen Kestrel	-	-	3	Sighting
Locustellidae	*Cincloramphus cruralis*	Brown Songlark	-	-	2	Sighting
Meliphagidae	*Gliciphila melanops*	Tawny-crowned Honeyeater	-	-	1	Sighting
Motacillidae	*Anthus australis*	Australian Pipit	-	-	4	Sighting
Rhipiduridae	*Rhipidura leucophrys*	Wilie Wagtail	-	-	1	Sighting

4.3.4 Significant Fauna

No significant fauna were recorded during the field survey.

One significant fauna taxon was assessed as having a high likelihood of occurring within the Survey Area:

- Carnaby's Cockatoo (*Zanda latirostris*), listed as Endangered under the BC Act and EPBC Act.

Note that ‘White-tailed Black Cockatoo’ (*Zanda sp.*) is considered analogous with the Carnaby's Cockatoo (*Zanda latirostris*) and therefore is not counted as a separate significant species.

Two significant fauna taxa were assessed as having a medium likelihood of occurring within the Survey Area:

- Malleefowl (*Leipoa ocellata*), listed as Vulnerable under the BC Act and EPBC Act.
- Western Spiny-Tailed Skink (*Egernia stokesii badia*), listed as Vulnerable under the BC Act and Endangered under the EPBC Act.

The remaining 24 significant fauna taxa were assessed as having a low likelihood of occurring within the Survey Area.

The complete results of the significant fauna likelihood of occurrence assessment including justification for the assessment outcome for each taxon is provided in **Appendix G**.

4.3.5 Black Cockatoo Habitat Assessment

4.3.5.1 Black Cockatoo Observations

No black cockatoos were recorded within the Survey Area.

4.3.5.2 Black Cockatoo Breeding Habitat

One potential black cockatoo breeding tree was recorded within the Survey Area, summarised below in **Table 9** and presented in **Map 6.** No hollows were recorded.

Table 9: Black cockatoo nesting trees recorded within the Survey Area

Latitude	Longitude	Taxa	DBH (mm)	Height (m)	Hollows
-29.6831	115.5731	Coastal Blackbutt (*Eucalyptus todtiana*)	530	8	0

4.3.5.3 Night Roosting Habitat

No black cockatoo roosting sites were recorded within the Survey Area. The single identified Coastal Blackbutt tree has the potential to be utilised as night roosting habitat (**Map 6**).

4.3.5.4 Foraging Habitat

No evidence of black cockatoo foraging in the form of feeding debris was observed within the Survey Area.

According to the DAWE (2022) Foraging Habitat Scoring Tool, the Survey Area contains 0.93 ha of high quality foraging habitat for the Carnaby's Cockatoo (**Table 10**).

According to the DCCEEW (2023a) scoring system for the assessment of foraging value of vegetation, the Survey Area contains 0.26 ha of Low to Moderate value and 0.67 of Negligible to Low foraging habitat for Carnaby's Cockatoo (**Table 11**).

Foraging habitat is presented in **Map 7**.

Table 10: DAWE Foraging Habitat Scoring Tool results for Carnaby's Cockatoo

Species	Area (ha)	Starting habitat score	Foraging potential	Connectivity	Proximity to breeding	Proximity to roosting	Impact from disease	Total score	Quality
Carnaby's Cockatoo	0.93	10	-2	0	0	-1	0	7	High Quality

Table 11: DCCEEW scoring system results for Carnaby's Cockatoo

Habitat	Area (ha)	Foraging value
Native Roadside Vegetation	0.26 ha	Low to moderate (3) – Native kwongan heath and shrubland, banksia or eucalypt woodlands with 10-20% projected foliage cover.
Isolated Trees	0.67 ha	Negligible to low (1) –Scattered specimens of known food plants but project foliage cover of these is <2%. May include: paddocks or urban areas with scattered foraging trees.
Cleared	598.29 ha	None (0) – No Proteaceae, eucalypts or other potential sources of food. May include bare ground or developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits).
Site context score	**Proximity of the site in relation to other habitat**	
3	Site is within 6 km of known breeding site. OR Site is within 12 km of other foraging resources with site condition of at least 3.	

5.0 Discussion

5.1 Flora and Vegetation

5.1.1 Floristic Composition

A total of 77 vascular flora taxa were recorded during the field survey. The suite of flora taxa recorded during the survey was considered typical for the Lesueur subregion of the Geraldton Sandplains IBRA region. Flora taxa recorded within the Survey Area were also consistent with database searches undertaken. Floristic diversity was considered within the expected range for a survey of this size within the Geraldton Sandplains region.

5.1.2 Significant Flora

No Threatened flora taxa pursuant to the EPBC Act 1999 and/or gazetted as Threatened Flora pursuant to the BC Act 2016 were recorded within the Survey Area.

One Priority flora taxa (*Grevillea erinacea* (P3)) pursuant to the *BC Act* was recorded within the Survey Area. While *G. erinacea* (P3) was recorded in low numbers from the Survey Area, it is likely that greater numbers will be located in adjacent remnant vegetation along Turkey Flat Road. It is recommended that an in season targeted survey is undertaken in this adjacent vegetation if the two current driveway access points are not used for the proposed project.

Prior to the field survey 116 significant flora taxa were recorded within 20 km of the Survey Area. Of these, 26 were classified as Threatened, ten as Priority 1,19 as Priority 2, 43 as Priority 3 and 18 as Priority 4. A likelihood assessment of significant flora taxa recorded in the vicinity of the Survey Area identified that five flora taxa had a high likelihood of occurrence, 24 had a medium likelihood, and 86 had a low likelihood.

Following the field survey, no flora taxa had a high likelihood of occurrence, 15 had a medium likelihood, and 100 had a low likelihood.

5.1.3 Introduced Flora

A total of 14 introduced flora taxa were recorded during the field survey. No WONs or Declared Pest taxa were recorded within the Survey Area.

Introduced flora taxa were a considerable component within the understory of the vegetation type recorded within the Survey Area. Introduced flora dominance across the understory of vegetation types is consistent with historical land use patterns in the Survey Area. Land within the Survey Area has been mostly cleared/disturbed for agricultural use (both cropping and cattle/sheep), and associated infrastructure (wells, troughs, dams, fence lines and vehicle tracks).

5.1.4 Vegetation Types and Condition

The Survey Area had minimal intact vegetation, one native vegetation type was described and mapped. The landform present includes gently undulating cream sand plains. The EtXa vegetation type comprised an upper stratum of mixed *Eucalyptus todtiana* and *Xylomelum angustifolium* low open woodland. The mid and lower strata of this community was dominated by tall open shrubs of *Leptospermopsis oligandra*, *Banksia sphaerocarpa* and *Calothamnus quadrifidus* and a tall open tussock grassland of *Ecdeiocolea monostachya*, **Ehrarta longiflora* and **Avena barbata.*

Additional areas of intact vegetation are located in adjacent remnant vegetation along Turkey Flat Road. Again, it is recommended that an in season detailed survey is undertaken in this adjacent vegetation if the two current driveway access points are not used for the proposed project. There are isolated trees and shrubs located in cleared paddocks, with cleared areas accounting for 99.85% of the Survey Area.

Vegetation condition across the Survey Area ranged from Very Good to Completely Degraded. Disturbance within the Survey Area was largely related to historical clearing for agricultural purposes and associated infrastructure (vehicle tracks, wells, dams, water troughs). Historical land use disturbance has enabled introduced flora taxa to spread into the middle and lower stratum of remnant vegetation delineated within the Survey Area.

5.2 Fauna

5.2.1 Fauna Habitats

The Native Roadside Vegetation fauna habitat is typical of the region and extends beyond the Survey Area. This habitat may provide connectivity to fauna in the region, acting as a corridor of movement from the Tathra National Park in the south to other remnant bush patches in the vicinity. The density of cover through the Native Roadside Vegetation is also of value to ground dwelling mammals and reptiles while Western Spiny tailed Skinks may use the dead trees through this habitat for sheltering. Eucalypts present may provide roosting opportunities, and proteaceous species may provide foraging material for the Carnaby's Cockatoo. Given the small extent of this habitat through the Survey Area it is unlikely that these species will be reliant solely on this habitat.

The Isolated Trees habitat may provide value to avian species and the Carnaby's Cockatoo for roosting. These trees have the potential to develop hollows in the future that may be suitable for nesting. Western Spiny-tailed Skinks may also use dead trees or limbs within this habitat for sheltering. Due to the lack of understorey surrounding this habitat and the isolated nature of the trees, it is unlikely that either significant species will be reliant on this habitat.

5.2.2 Significant Fauna

5.2.2.1 High Likelihood of Occurrence within the Survey Area

Carnaby's Cockatoo (*Zanda latirostris*) – EN (State and Federal)

Carnaby's Cockatoos nest in the hollows of a wide range of eucalypt trees, with a preference for smooth barked trees such as Salmon Gum (*E. salmonophloia*) and Wandoo (*E. wandoo*) but also rough barked *Eucalyptus* and *Corymbia* trees such as Red Morrell (*E. longicornis*), York Gum (*E. loxophleba*), Marri (*Corymbia calophylla*) and Tuart (*E. gomphocephala*) (Johnstone and Storr, 1998). Carnaby's Cockatoos feed on seeds, nuts, and flowers of a variety of native and exotic plants, including *Banksia* spp., Pine trees (*Pinus* sp.), Marri, Jarrah (*E. marginata*), *Grevillea* spp., *Allocasuarina* spp., and *Hakea* spp. (Shah, 2006).

The Survey Area occurs within the modelled distribution of the Carnaby's Cockatoo, however, the species was not recorded during the field survey. The DBCA database searches identified 133 records occurring within 50 km of the Survey Area. An additional 57 records of 'White-tailed Black Cockatoo' were recorded within a 50 km radius of the survey area. These records are assumed to be Carnaby's Cockatoo, due to the species' distribution. The Survey Area contains 0.26 ha of low to moderate foraging habitat (Roadside Native Vegetation) as identified by the DCCEEW foraging habitat scoring tool. Additionally, this habitat contains a eucalypt tree that have the potential to develop hollows that may be suitable for use by the species.

5.2.2.2 Medium Likelihood of Occurrence within the Survey Area

Malleefowl (*Leipoa ocellata*) – VU (State and Federal)

The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or Acacia. A sandy substrate and abundance of leaf litter are required for breeding (Department of the Environment and Energy, 2018). Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils where habitats tend to be thicker and there is an abundance of food plants. Much of the best habitat for Malleefowl has already been cleared or has been modified by grazing via Sheep, Cattle, Rabbits and Goats (Benshemesh, 2007). The species nests in large mounds of dirt and leaf litter, up to five metres wide and one metre tall (Menkhorst et al., 2017).

The DBCA database search identified 29 records occurring within 50 km of the Survey Area, with nearest record identified 15.7 km north in 2005 and 23.7 km northeast in 2016. Within the Survey Area the Roadside Native Vegetation may be suitable for use due to the denser midstorey that is favoured by the species. The species is unlikely to be dependent on the Survey Area given the small extent of favourable habitat, however, Malleefowl may traverse through the Survey Area given its proximity to Tathra National Park to the south and Wotto Nature Reserve to the west.

Western Spiny-tailed Skink (*Egernia stokesii badia*) – VU (State) and EN (Federal)

A brown form of the Western Spiny-tailed Skink occurs in the Wheatbelt and Shark Bay area and inhabits tree hollows and fallen logs, capable of providing a combination of basking and shelter sites. This is distinct from the black form of the species which occurs in the Murchison region and inhabits rocky outcrops with crevices and boulders (Department of Agriculture Water and the Environment, 2020). The species leaves distinctive clusters of faecal droppings outside refuges (How, Dell and Robinson, 2003).

The DBCA database search identified ten records occurring within 50 km of the Survey Area, the nearest of which occurred 23.1 km northeast in 1945 and most recently 24.7 km west in 2014. The Western Spiny-tailed Skink may use the Roadside Native Vegetation due to the presence of logs and standing dead trees which provide suitable basking and sheltering sites for the species.

5.2.3 Black Cockatoo Habitat Assessment

Direct evidence of breeding was not observed during the black cockatoo assessment, and only one potential tree was identified. A known white-tailed black cockatoo nesting site occurs 8.7 km north of the Survey Area (DBCA, 2024c) and the Survey Area is within the breeding distribution of the Carnaby's Cockatoo. Suitable nest hollows take up to 200 years to develop (DAWE, 2022), therefore these trees provide a resource that is critical for the long-term survival of black cockatoos and is not able to be replaced in the short-term.

Black cockatoos prefer roosting sites located near water sources and require foraging resources within 20 km of their roosts (DAWE, 2022). The presence of nearby water at Yarra Yarra Lake Conservation Park suggests that the species may roost within the area, however, the limited amount of potential roosting trees present suggests that the species will not be reliant on the Survey Area.

Black cockatoo foraging habitat is limited through the Survey Area and was of Low to Moderate value as identified by the DCCEEW scoring tool (DCCEEW, 2023). Similar foraging habitat is abundant throughout the broader region, though, regional habitat connectivity has been impacted by clearing and fragmentation from agriculture. Black cockatoos rely on year-round availability of foraging resources; during the breeding season for successful fledging of chicks, and during the non-breeding season to rebuild condition (DAWE, 2022).

6.0 Conclusion

6.1 Flora and Vegetation

- A total of 77 vascular flora taxa were recorded in the Survey Area from 39 genera and 17 families.
- No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened pursuant to the BC Act 2016 were recorded during the survey.
- One DBCA listed Priority flora taxa was recorded – *Grevillea erinacea* (P3).
- Fourteen introduced flora taxa were recorded within the Survey Area, none are listed as WoNS or Declared Pests.
- One native vegetation type (EtXa) was delineated across one broad landform present within the Survey Area.
- The condition of the Survey Area consists of 0.26 ha (0.04%) Very Good and 598.96 ha (99.96%) Completely Degraded.
- No TECs or PECs were recorded within the Survey Area.

6.2 Fauna

- One species was assessed to have a high likelihood of occurrence, the Carnaby's Cockatoo (*Zanda latirostris*), listed as Endangered under the BC Act and EPBC Act.
- Two significant fauna taxa were assessed as having a medium likelihood of occurring within the Survey Area, the Malleefowl (*Leipoa ocellata*), listed as Vulnerable under the BC Act and EPBC Act and the Western Spiny-Tailed Skink (*Egernia stokesii badia*), listed as Vulnerable under the BC Act and Endangered under the EPBC Act.
- No significant fauna were recorded within the Survey Area during the field survey.
- Two fauna habitats (excluding cleared) were mapped within the Survey Area, including Native Roadside Vegetation and Isolated Trees. The Native Roadside Vegetation presents the most value to fauna taxa.
- One potential nesting tree was identified within the Survey Area. This tree did not contain any hollows.
- The DAWE foraging habitat scoring tool identified 0.93 ha of high-quality foraging habitat for the Carnaby's Cockatoo. The DCCEEW foraging scoring tool identified 0.26 ha of Low to Moderate foraging habitat and 0.67 ha of Negligible to Low foraging habitat.

Regards,

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Lukas Geidans
Associate Zoologist – Ecology and Biodiversity

Attachments:	Appendix A	Map 1: Survey Area and Relevé and Habitat Assessment locations
		Map 2a: DBCA Database Fauna Search Results
		Map 2b: DBCA Database Flora Search Results
		Map 3: DBCA Black Cockatoo Search Results
		Map 4: Vegetation Map and location of Conservation Significant flora
		Map 5: Vegetation Condition Mapping
		Map 6: Fauna Habitat and Fauna Records
		Map 7: Black Cockatoo Foraging Habitat
	Appendix B	Flora likelihood table
	Appendix C	Flora inventory
	Appendix D	Flora site sheets
	Appendix E	Fauna Database Search Results
	Appendix F	Fauna Habitat Site Sheets
	Appendix G	Fauna Likelihood Table

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Appendix A Maps

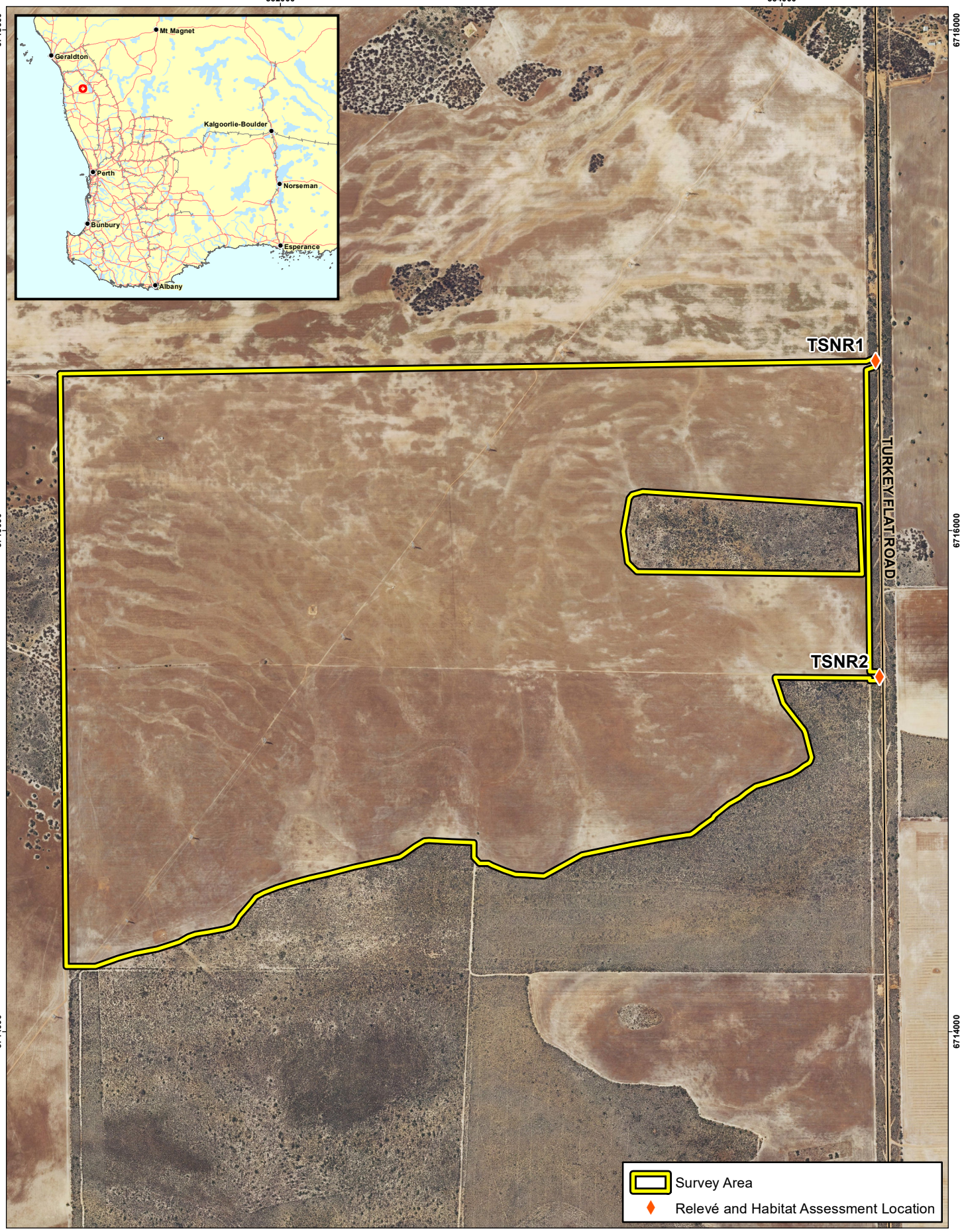
Flora and Fauna Assessment

Killawarra Solar and BESS Project

Trina Solar

SLR Project No.: 675.072651.00003

1 April 2025



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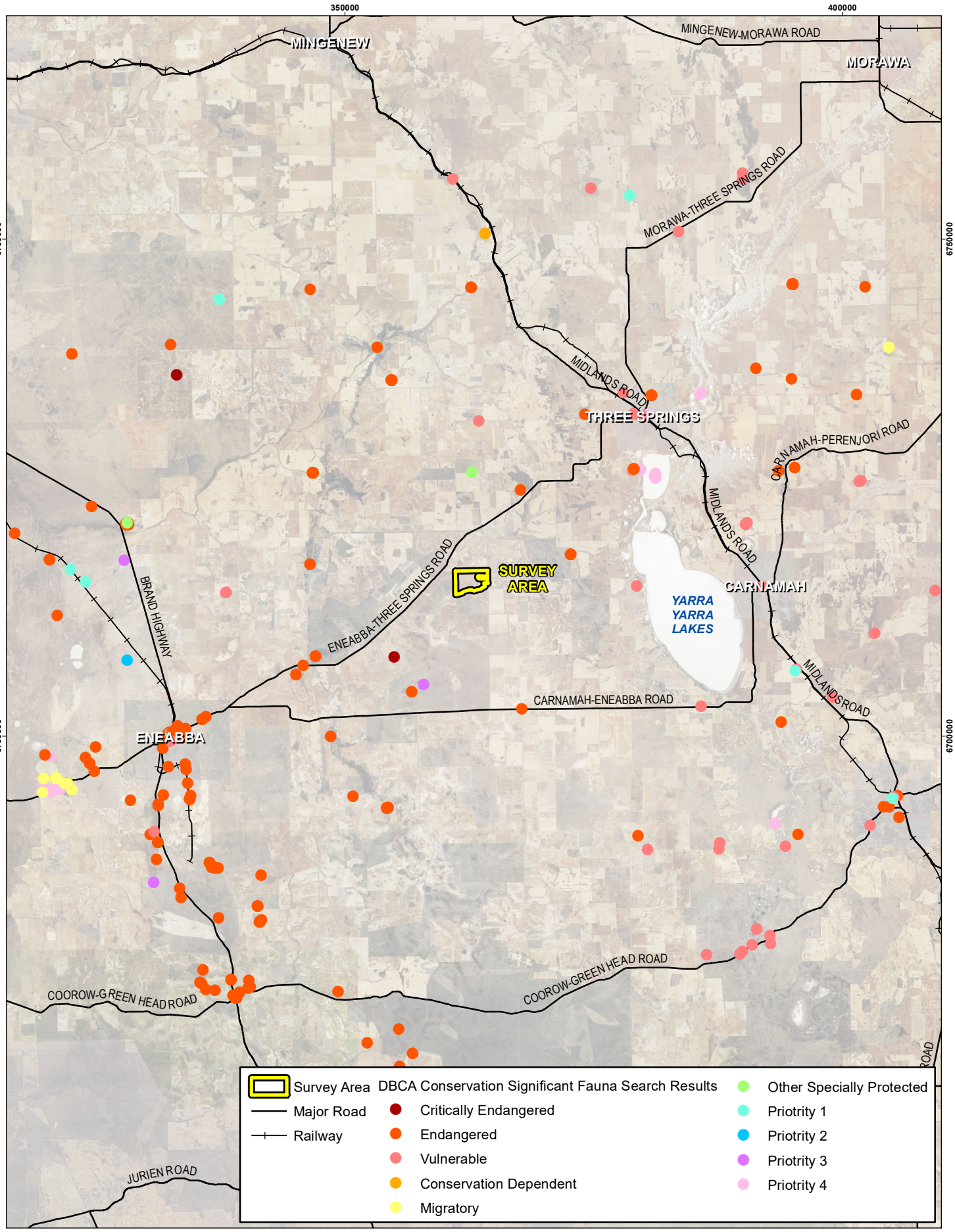
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Survey Area
MAP 1

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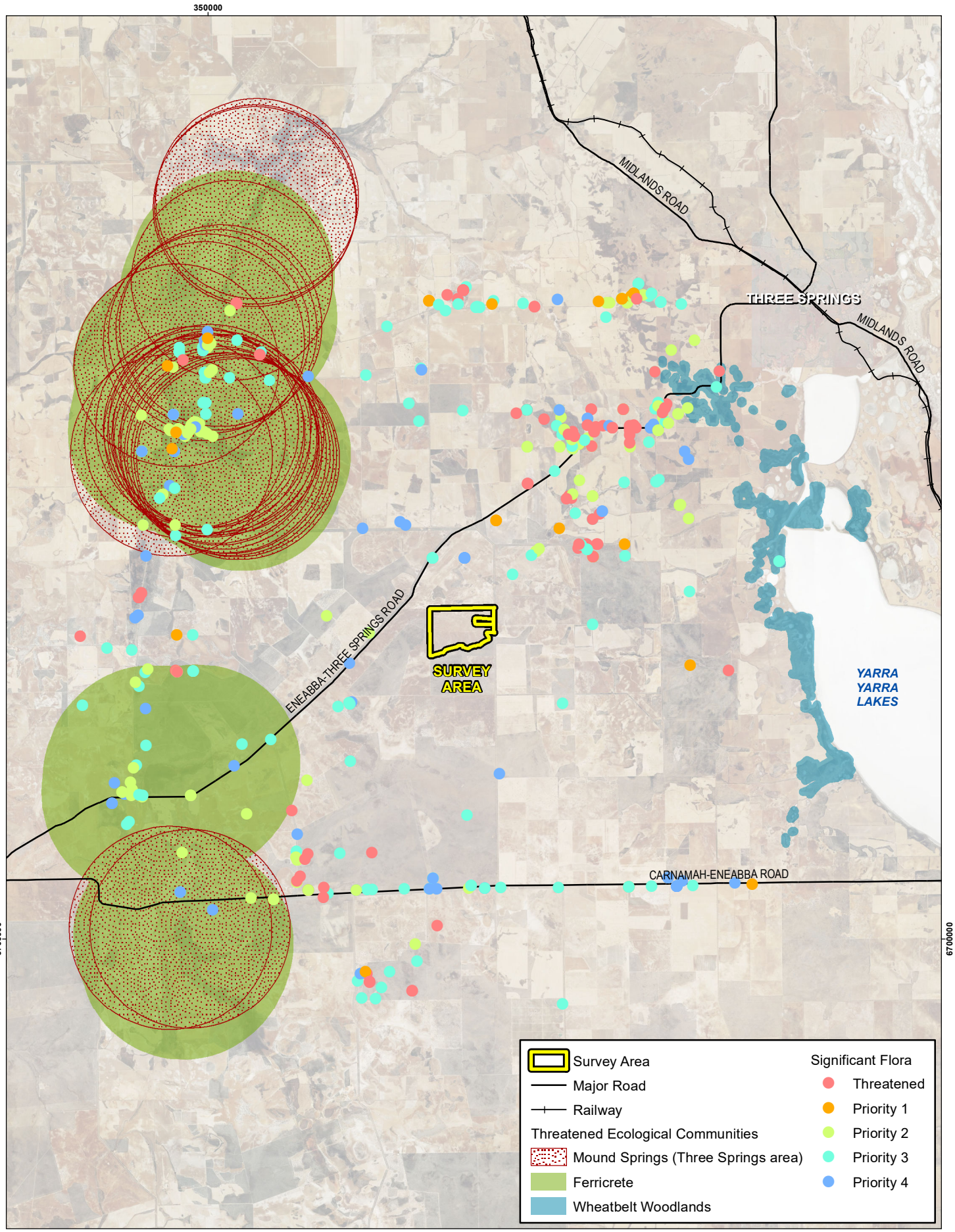
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DBCA Conservation Significant Fauna Search Results
MAP 2A

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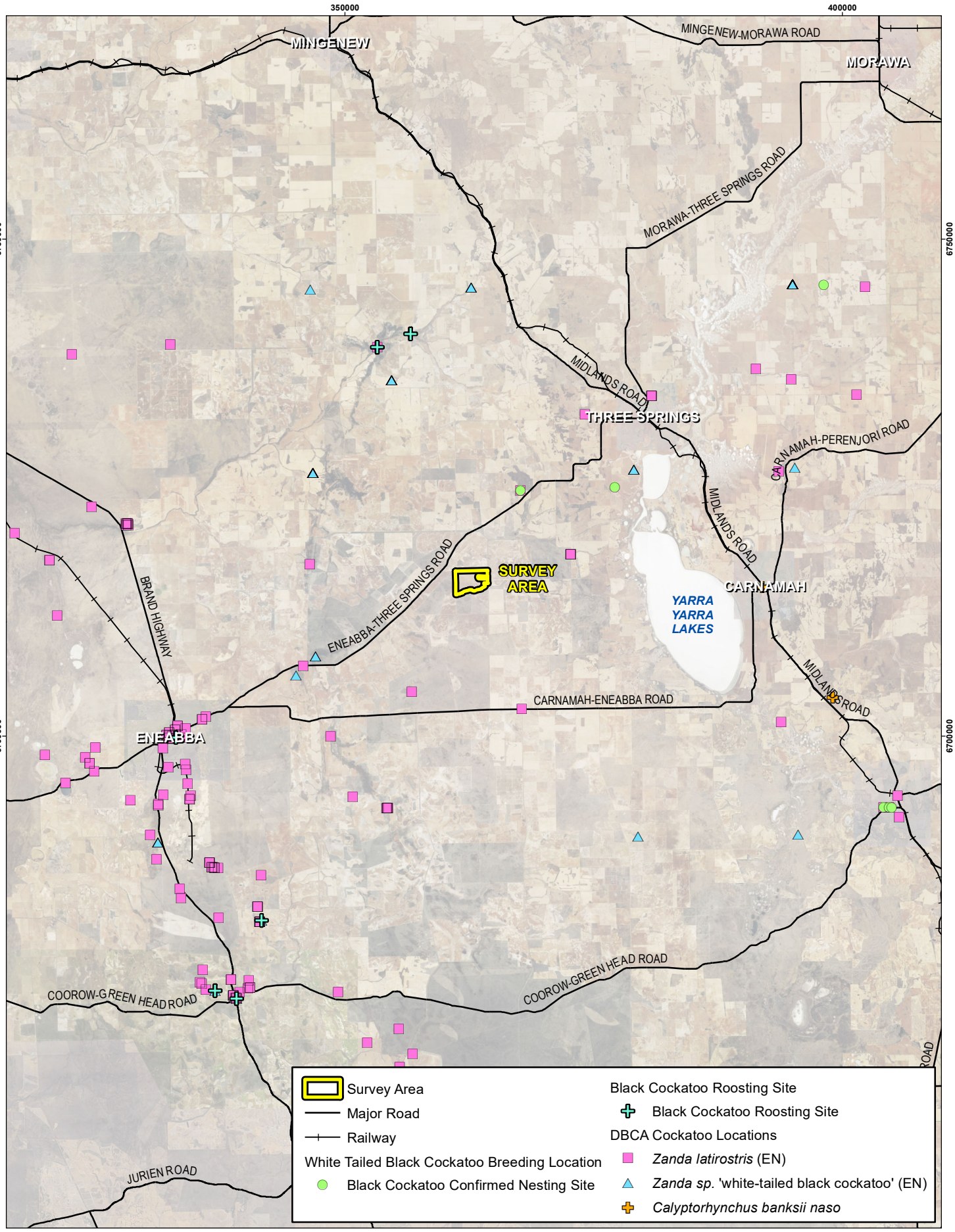
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W.A. Flora and Fauna Assessment

DBCA Conservation Significant Flora Seach Results MAP 2B

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Service Layer Credits: Landgate / SLIP

Coordinate System: GDA2020 MGA Zone 50

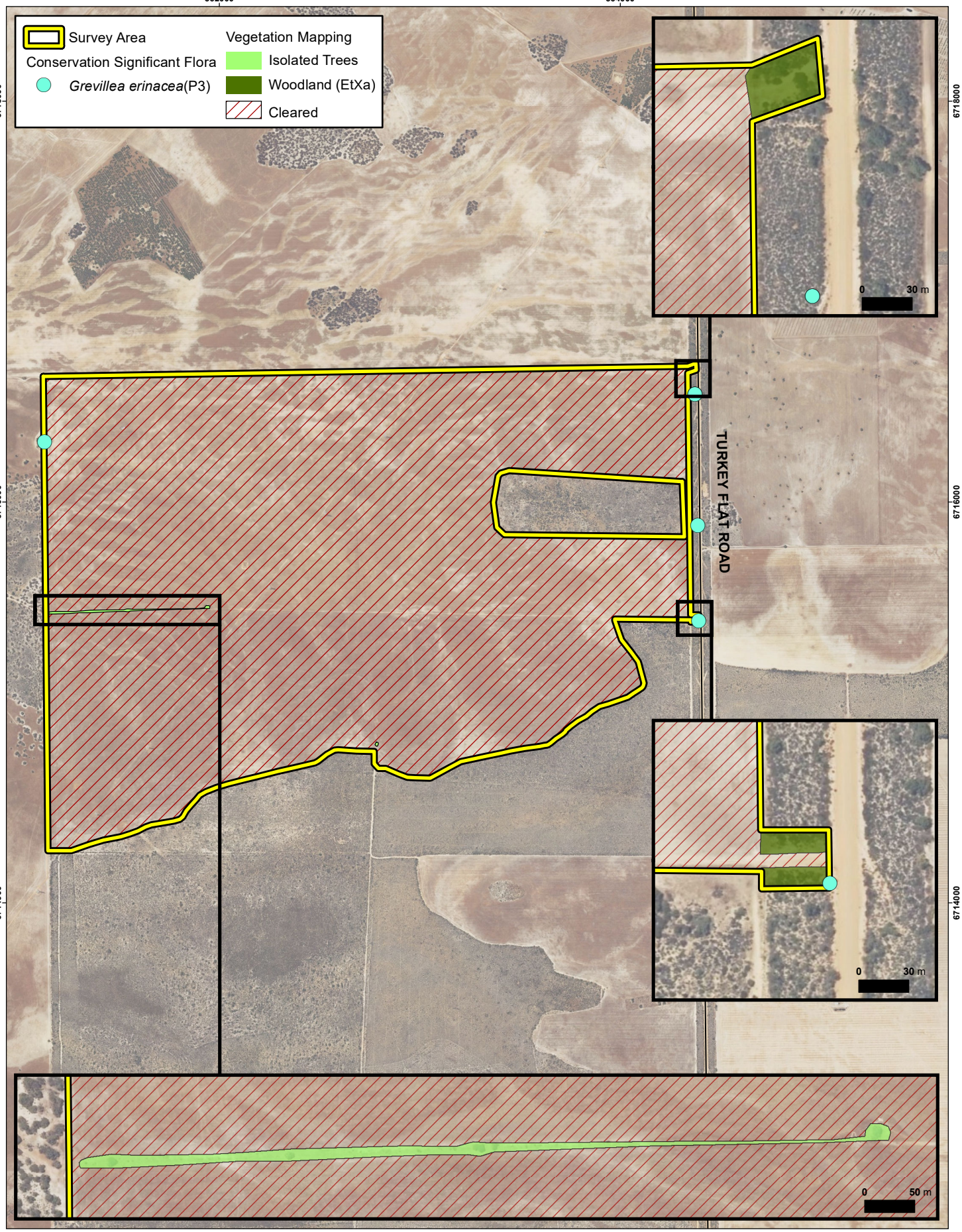
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Project Number	: 675.072651.00003
Date Drawn	: 6/12/2024
Drawn By	: Environmaps
Reviewed By	: SR

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DBCA Black Cockatoo Search Results
MAP 3

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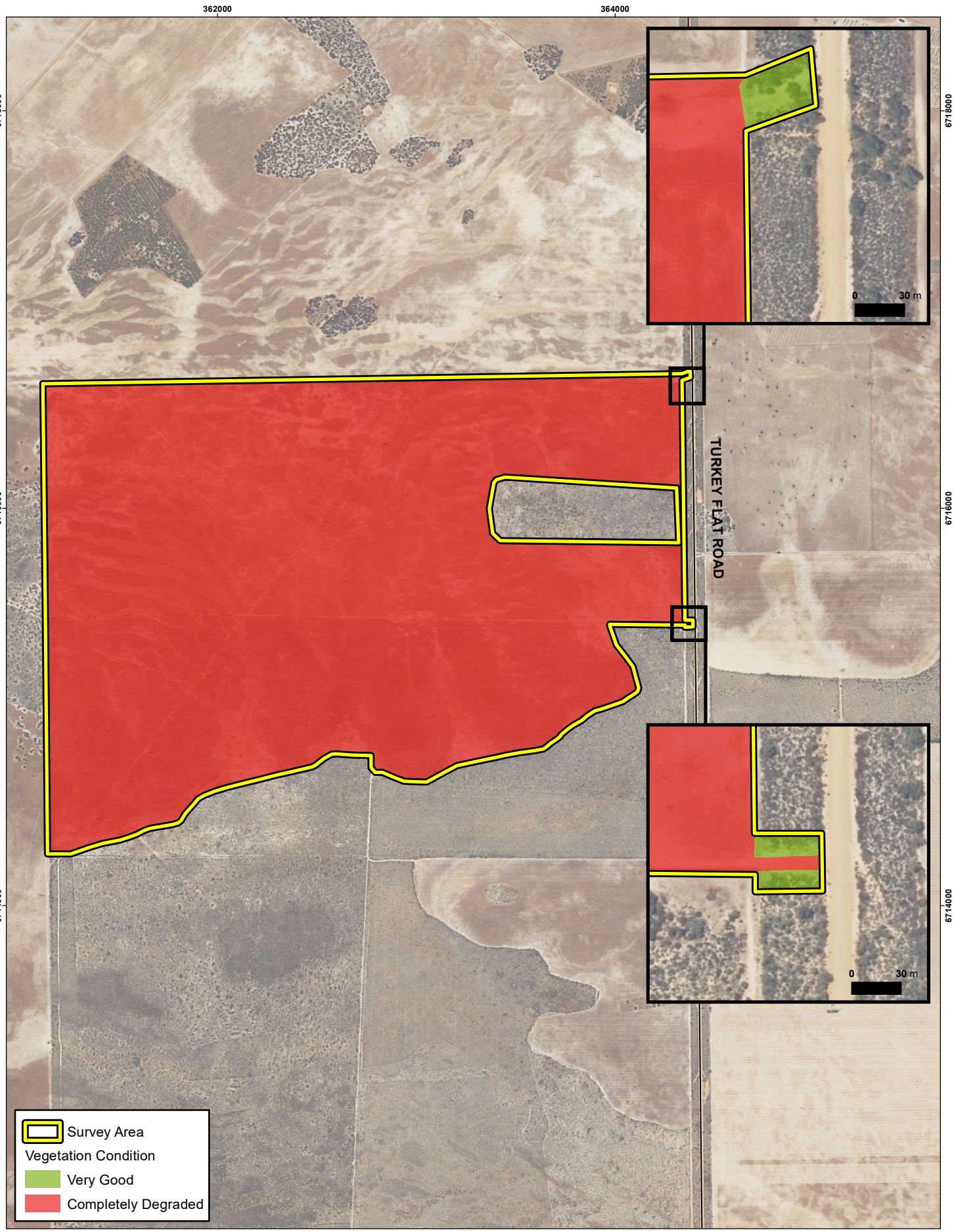
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Vegetation Map and Location of Conservation Significant Flora
MAP 4

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Project Number	: 675.072651.00003
Date Drawn	: 6/12/2024
Drawn By	: Environmaps
Reviewed By	: SR

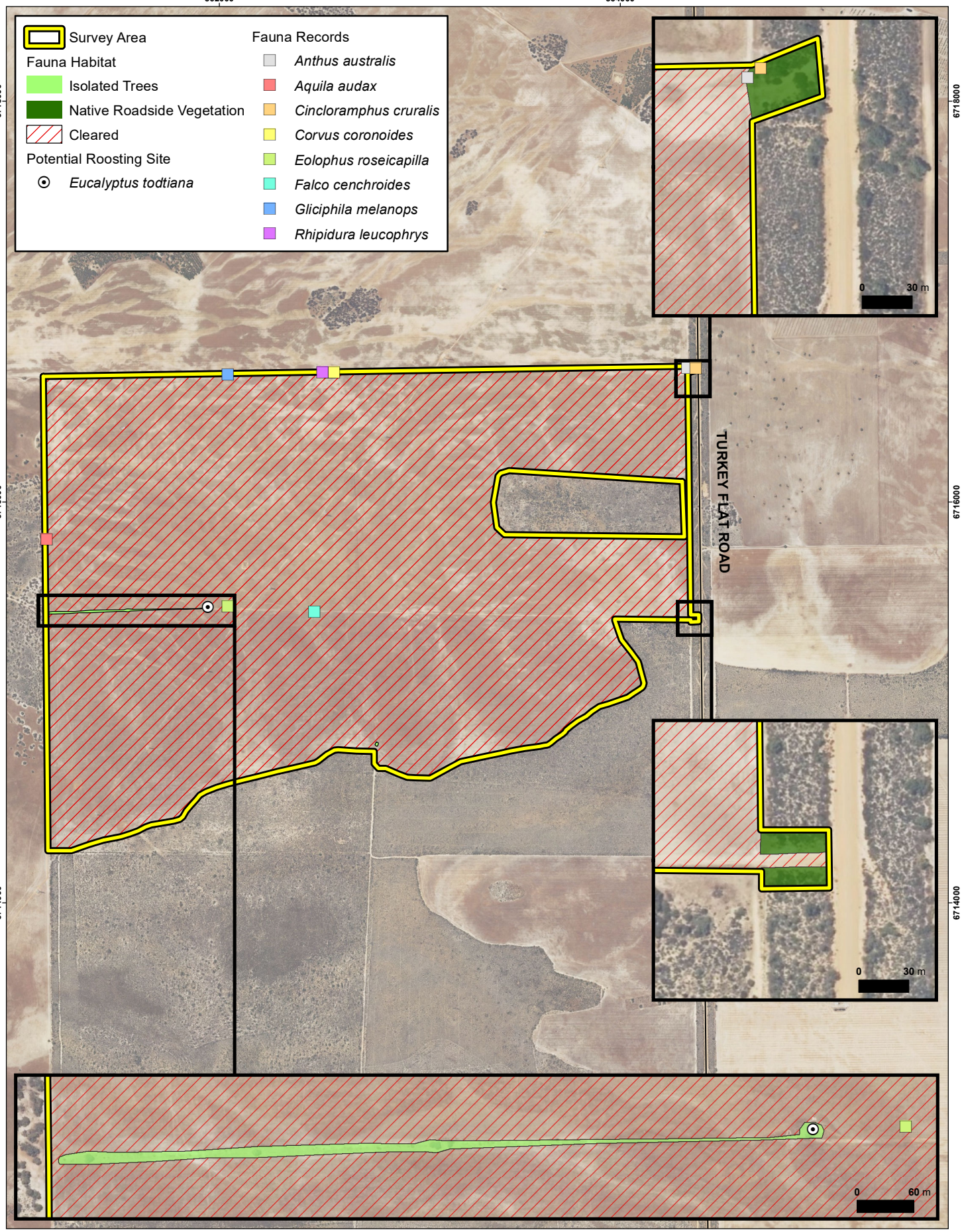
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Vegetation Condition Mapping
MAP 5

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Reviewed By	: SR

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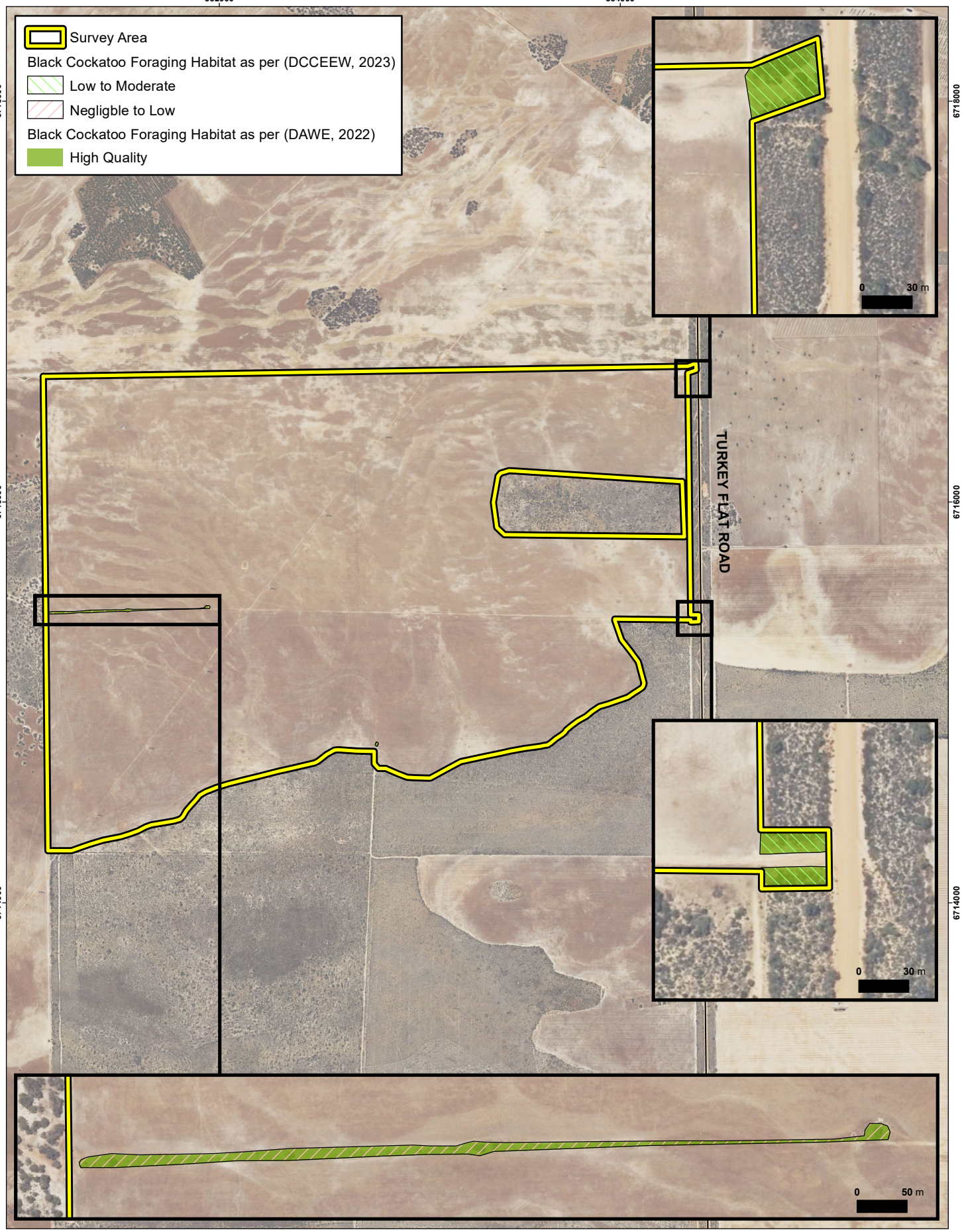
Killawarra Solar and BESS Project,

W.A. Flora and Fauna Assessment

Fauna Habitat and Fauna Records

MAP 6

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Black Cockatoo Foraging

MAP 7

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Appendix B Flora Likelihood table

Flora and Fauna Assessment

Killawarra Solar and BESS Project

Trina Solar

SLR Project No.: 675.072651.00003

1 April 2025

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2024 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing. 1: Department of the Environment (2024). SPRAT EPBC Threatened Flora in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. 2: Department of Biodiversity, Conservation and Attractions (2024). FloraBase - TheWestern Australian Flora. https://florabase.dpaw.wa.gov.au/

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Pre-Survey Likelihood of Occurrence	Habitat occurs within the Survey Area	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Acacia aprica	T	EN		X		N/A	Jun - Jul	Red or gravelly sand, sandy loam. Plains, rocky hills.[2]	Low	No	Low
Acacia cochlocarpa subsp. *cochlocarpa*	T	EN		X		N/A	Jun - Jul	Typically associated with brown sand, or clayey sand with laterite.[1] [2]	Low	No	Low
Acacia recurvata	T	EN	X	X	X	11.10	Jul	Sandy clay, granitic clay-loam. Creek lines, plains, breakaways, low hills.[1]	Low	No	Low
Chorizema humile	T	EN		X		N/A	Jul - Sep	Typically found in red loam, brown sandy clay with decomposing granite or in clay soils, on plains in scrub or open tree mallee.[1]	Low	No	Low
Darwinia chapmaniana	T	EN		X		N/A	Jun, Sep - Oct	Grey/yellow-brown sand, pale clay, laterite limestone sandstone	Low	Yes	Low
Dasymalla axillaris	T	EN		X		N/A	Sep or Oct - Dec	Known from sandy soils in the Yalgoo area of the northern area of the Avon Wheatbelt.[1]	Low	No	Low
Daviesia bursarioides	T	EN	X	X	X	13.81	Aug - Oct	Found in shallow brown sandy loams with extensive lateric gravel.[1]	Low	No	Low
Daviesia speciosa	T	EN	X	X	X	12.03	Apr - May	Known from five populations north-east of Eneabba. Plants grow in dense low shrubland in shallow, gravelly sand over gravelly red clay or lateritic loams.[1]	Low	No	Low
Eleocharis keigheryi	T	VU	X		X	18.27	Aug - Nov	Grows in small clumps in a substrate of clay or sandy loam. This species is emergent in freshwater creeks, and transient waterbodies such as drainage lines and claypans in water to	Low	No	Low
Eremophila nivea	T	EN		X		N/A	Aug - Oct	Typically found wihtin red-brown sandy loam and lateritic gravel, or in clayey loam, usually near the edge of seasonal creeks.[1]	Low	No	Low
Eucalyptus crispata	T	EN	X	X	X	7.59	Mar - Jun	Grows on clayey soils of shallow gullies and on lateritic, and occasionally granitic, breakaways and slopes. It occurs as small stands in low woodland and mallee.[1]	Medium	No	Low
Eucalyptus leprophloia	T	EN		X		N/A	Aug - Oct	White or grey sand over laterite. Valley slopes.[2]	Low	Yes	Low
Eucalyptus rhodantha var. *rhodantha*	T	VU	X	X	X	8.13	Jul or Sep - Dec or Jan	Grey/yellow/red sand over laterite. Undulating country, hillslopes.[2]	Medium	Yes	Medium
Gastrolobium hamulosum	T	EN		X		N/A	Aug - Oct	Sandy, often gravelly soils or clay. Flats, slopes, ridges.[2]	Low	Yes	Low
Grevillea christineae	T	EN		X		N/A	Aug - Sep	Clay loam, sandy clay, often moist.[2]	Low	No	Low

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	DBCA	EPBC	NatureMap	PMST	DBCA						
Hakea megalosperma	T	VU	X	X	X	12.41	May - Jun	This Hakea grows in low heath in grey sand and lateritic gravel or laterite boulders on hilltops and ridges, or occasionally with emergent Eucalyptus todtiana in white or yellow grey sand.[1]	Low	Yes	Low
Hemiandra gardneri	T	EN		X		N/A	Aug - Oct	Grey or yellow sand, clayey sand. Sandplains.[2]	Low	Yes	Low
Hemiandra rutilans	T	EN		X		N/A	Oct - Nov	Yellow/ Grey sand[2]	Low	Yes	Low
Hensmania chapmanii	T	VU	X	X	X	7.20	Dec or Jan	Yellow-grey or lateritic sand.[2]	Medium	Yes	Medium
Paracaleana dixonii	T	EN	X	X	X	18.24	Oct - Dec or Jan	Typically occurs in deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland.[2]	Low	Yes	Low
Roycea pycnophylloides	T	EN		X		N/A	Sep	Sandy soils, clay. Saline flats.[2]	Low	No	Low
Styphelia marginata	T	EN		X		N/A	Jul - Aug	Grows yellow, gravelly lateritic sand, undulating plains.[2]	Low	Yes	Low
Styphelia obtecta	T	EN		X		N/A	Aug - Oct	Grey sand.[2]	Low	Yes	Low
Thelymitra stellata	T	EN	X	X	X	13.92	Oct - Nov	Grows on both on ridges and slopes, flats, also on riverbanks and breakaways. Soil types are red, brown, yellow, or grey sandy loams clay or gravel over laterite or gravel. Dry, moist or	Low	No	Low
Verticordia albida	T	EN	X	X	X	11.29	Nov - Dec or Jan	Grows in grey to yellow to white sand, usually with or over gravel. Mostly associated with other verticordias in shrubland and open banksia woodland.[2]	Low	Yes	Low
Wurmbea tubulosa	T	EN		X		N/A	Jun - Aug	Clay, loam. River banks, seasonally-wet places.[2]	Low	No	Low
Acacia congesta subsp. *cliftoniana*	P1		X		X	15.35	Aug - Sep	Occurs from Yandanooka South to near Three Springs. Grows in rocky or lateritic loam in Mallee communities.[2]	Low	No	Low
Diuris eburnea	P1		X		X	17.21	Nov	Found along banks of the Arrowsmith River growing in seasonally wet areas and spring areas.[2]	Low	No	Low
Drosera pedicellaris	P1		X		X	7.59	Oct - Nov	Deep beige sand.[2]	Medium	Yes	Medium
Grevillea amplexans subsp. *adpressa*	P1		X		X	5.81	Aug - Oct	Yellow sand, loam. Dunes, road verge	Medium	No	Low
Lasiopetalum ogilvieanum	P1		X		X	7.12	Jul - Oct	White/grey or yellow sand, stony loam. Undulating plains, lateritic rises.[2]	Medium	Yes	Medium

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Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Pre-Survey Likelihood of Occurrence	Habitat occurs within the Survey Area	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Scholtzia brevistylis subsp. brevistylis	P1		X		X	17.51	Oct - Nov	Red/brown loam. Plain.[2]	Low	No	Low
Stylidium carnosum subsp. Narrow leaves (J.A. Wege 490)	P1		X		X	17.81	Sep - Nov	White/grey sand. Lateritic soils. Slopes of laterite hill.[2]	Low	Yes	Low
Thomasia x formosa	P1		X		X	16.68	Sep - Oct	Laterite.[2]	Low	No	Low
Verticordia dasystylis subsp. *oestopoia*	P1		X		X	19.51	Oct	Gritty soils over granite. Outcrops. Slope. Brown clayey loam and sheet granite.[2]	Low	No	Low
Verticordia luteola var. *rosea*	P1		X		X	14.33	Dec or Jan	Grows on plains in deep white sand, in shrubland with Eucalyptus todtiana, Banksia attenuata, B. menziesii and Xylomelum angustifolium.[2]	Low	Yes	Low
Acacia chapmanii subsp. *chapmanii*	P2		X		X	12.55	Aug - Sep	Yellow/brown sand, laterite, clay loam. Plains, depressions, saline flats. Occurs near Three Springs and Marchagee in sand, laterite and clay loam. Sometimes on saline flats, in heath,	Low	No	Low
Babingtonia peteriana	P2		X		X	5.48	Sep - Oct	Yellow/grey sand, sandy clay, lateritic gravelly soils.[2]	Medium	Yes	Medium
Calothamnus arcuatus	P2		X		X	17.05	Jun - Aug	Shallow clay loam or yellow/brown sand over rock or sandstone. Creek lines.[2]	Low	No	Low
Darwinia sp. Strawberry (M.G. Corrick 8279)	P2		X		X	15.11	Sep - Nov	Gently undulating sandplains, yellow sand, or grey sand in Banksia heath.[2]	Low	Yes	Low
Eucalyptus abdita	P2		X		X	9.84		Laterite, sandy clay with gravel over laterite. Slopes, breakaways	Medium	No	Low
Guichenotia quasicalva	P2		X		X	14.20	Sep - Oct	Sandy clay over laterite. Drainage line.[2]	Low	No	Low
Hemigenia diadela	P2		X		X	19.21	October	Lateritic slopes	Low	No	Low
Hemigenia pimeleifolia	P2		X		X	11.09	Aug	yellow/brown loam, Sandstone, laterite	Low	No	Low
Homalocalyx chapmanii	P2		X		X	10.81	Sep - Oct	Yellow or grey/brown sand. Undulating plains, weathered granite.[2]	Low	Yes	Low
Lyginia excelsa	P2		X		X	16.49	Mar - Nov	Sand. Dry heath & Banksia woodland	Low	Yes	Low
Micromyrtus uniovulum	P2		X		X	9.45	Sep - Oct	Red-brown loam-clay, lateritic gravel, boulder laterite. Rocky slope, breakaway.[2]	Medium	No	Low

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	DBCA	EPBC	NatureMap	PMST	DBCA						
Millotia jacksonii	P2		X		X	16.52	Sep	Shallow sandy soils. In depressions on sandstone	Low	No	Low
Stylidium cornuatum	P2		X		X	17.07	Sep	Orange brown clay loam, winter wet depressions	Low	No	Low
Stylidium pseudocaespitosum	P2		X		X	8.87	Sep - Nov	Grows white, grey or yellow sand over laterite. Breakaways and hillslopes.[2]	Medium	Yes	Low
Stylidium sp. Three Springs (J.A. Wege & C. Wilkins JAW 600)	P2		X		X	4.65	Sep	Yellow-brown clayey sand over granite or laterite. Slope.[2]	High	No	Low
Stylidium tinkeri	P2		X		X	16.20	Oct	Grey sandy soil. Seasonal wetlands.[2]	Low	No	Low
Styphelia pallens	P2		X		X	14.05	Oct - Nov	White, grey, brown loam sand, laterite, hillslope	Low	Yes	Low
Synaphea sparsiflora	P2		X		X	6.83	Aug - Sep	Sandy loam over laterite	Medium	No	Low
Synaphea xela	P2		X		X	17.88		Red-brown gravelly sand, white-pink, grey-brown clayey sand and loam, over laterite. Undulating sites	Low	Yes	Low
Acacia flabellifolia	P3		X		X	10.83	Aug - Sep	Occurs near Yandanooka and Watheroo, south-western W.A. Grows in rocky or lateritic loam on low hills in open eucalypt woodland.[2]	Low	No	Low
Acacia isoneura subsp. *isoneura*	P3		X		X	16.75	Aug - Sep	Occurs in the Mingenew-Three Springs area. Grows in sand, Yellow/brown sand. Flats, low rises .[2]	Low	Yes	Low
Acacia lanceolata	P3		X		X	16.71	Jul - Aug	Restricted to the Mingenew - Three Springs area, south-western WA. Grows on low rocky or lateritic hills.[2]	Low	No	Low
Allocasuarina grevilleoides	P3		X		X	15.15	Sep - Nov	Sand over laterite, gravel.[2]	Low	Yes	Low
Arnocrinum gracillimum	P3		X		X	19.11	Oct - Nov	White, grey, yellow or lateritic sand.[2]	Low	Yes	Low
Austrostipa nunaginensis	P3		X		X	13.38		Yellow brown sands.[2]	Low	Yes	Low
Banksia borealis subsp. *elatior*	P3		X		X	11.10	Jul - Nov	Lateritic gravelly soils, yellow sand. Hillslopes.[2]	Low	No	Low
Banksia cypholoba	P3		X		X	6.24	Aug	Sand and gravelly loam.[2]	Medium	Yes	Medium

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Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Pre-Survey Likelihood of Occurrence	Habitat occurs within the Survey Area	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Banksia fraseri var. crebra	P3		X		X	7.28		Slopes, hilltops. Grey, yellow, brown or white sand or sandy clay. Laterite.[2]	Medium	Yes	Medium
Banksia fraseri var. *oxycedra*	P3		X		X	14.83	Jul - Sep	Lateritic gravel. Hillslopes and breakaways.[2]	Low	No	Low
Banksia splendida subsp. *macrocarpa*	P3		X		X	6.71	Jul - Aug	Lateritic gravel[1]	Medium	No	Low
Banksia subulata	P3		X		X	12.74	Sep	White/grey or yellow sand over laterite, gravelly laterite[1]	Low	Yes	Low
Banksia trifontinalis	P3		X		X	18.55	Aug - Oct	Laterite.[2]	Low	No	Low
Beyeria gardneri	P3		X		X	8.63	Aug - Sep	Yellow sand	Medium	Yes	Medium
Calytrix ecalycata subsp. *ecalycata*	P3		X		X	3.82	Jul or Sep - Oct.	Yellow or white sand, sandy gravel, clay loam, granite, sandstone. Uplands, valley flats, ridges, hills, road verges.[2]	High	Yes	Medium
Drosera prophylla	P3		X		X	13.65	Jun - Jul	Laterite-silica sand soils. Hilltops[2]	Low	No	Low
Eucalyptus macrocarpa x pyriformis	P3		X		X	12.32	Apr or Aug - Oct	Sand, lateritic sandy soils. Hills, rocky ironstone ridges, sandplains.[2]	Low	Yes	Low
Grevillea biformis subsp. *cymbiformis*	P3		X		X	19.26	Jan - Mar or Aug - Dec	White sand.[2]	Low	Yes	Low
Grevillea erinacea	P3		X		X	4.65	Jul - Dec	Grows white, grey or yellow sand, often with lateritic gravel.[2]	High	Yes	Recorded
Grevillea leptopoda	P3		X		X	13.73	Aug - Sep	Loam and lateritic gravel, sand, clay.[2]	Low	No	Low
Grevillea makinsonii	P3		X		X	8.64	Jul or Sep - Oct	White, grey or yellow sand over laterite, loam, gravel, clay. Rocky hills, sandplains.[2]	Medium	Yes	Medium
Guichenotia alba	P3		X		X	10.76	Jul - Aug	Sandy and gravelly soils. Low-lying flats, depressions.[2]	Low	No	Low
Hemiandra sp. Eneabba (H. Demarz 3687)	P3		X		X	13.76	Feb	Sand. Disturbed sites.	Low	Yes	Low
Hensmania stoniella	P3		X		X	13.38	Sep - Nov	White, grey or lateritic sand, often winter-wet.[2]	Low	No	Low

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2024 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing. 1: Department of the Environment (2024). SPRAT EPBC Threatened Flora in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. 2: Department of Biodiversity, Conservation and Attractions (2024). FloraBase - TheWestern Australian Flora. https://florabase.dpaw.wa.gov.au/

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Pre-Survey Likelihood of Occurrence	Habitat occurs within the Survey Area	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Hibbertia subvillosa	P3		X		X	13.85	Aug - Sep, May	Grey sandy loam, laterite	Low	No	Low
Lechenaultia juncea	P3		X		X	3.95	Sep-Dec	White, grey or yellow sand, sandy gravel.[2]	High	Yes	Medium
Persoonia rudis	P3		X		X	16.43	Sep - Dec or Jan	White, grey or yellow sand, often over laterite.[2]	Low	Yes	Low
Petrophile biternata	P3		X		X	15.35	Aug - Oct	Yellow/grey sand and gravel, laterite, quartzite soils. Lateritic ridges, plains.[2]	Low	Yes	Low
Petrophile globifera	P3		X		X	20.12	Aug - Oct	Extends from near Morawa south to the Marchagee area and south-east to near Pithara in the South-West Botanical Province. Occurs in sand.[2]	Low	Yes	Low
Petrophile septemfida	P3		X		X	11.04	Jul - Sep	White/Grey sand, laterite	Low	Yes	Low
Phlebocarya pilosissima subsp. *pilosissima*	P3		X		X	13.76	Aug - Oct	White or grey sand, lateritic gravel.[2]	Low	Yes	Low
Podotheca uniseta	P3		X		X	7.51	Sep - Dec	White/grey sand, sandy loam. Samphire flats	Medium	No	Low
Scaevola globosa	P3		X		X	17.30	Oct - Dec	Sandy soils	Low	Yes	Low
Stylidium drummondianum	P3		X		X	16.46	Aug - Oct	Sand or clayey sand over laterite. Upper hillslopes, breakaways. Low heath, mallee shrubland.[2]	Low	No	Low
Stylidium torticarpum	P3		X		X	5.16	Sep - Nov	Sandy clay and clay loam over laterite. Adjacent to creek lines, depressions, and beneath breakaways. Heath or mallee shrubland.[2]	Medium	No	Low
Styphelia hyalina	P3		X		X	16.12	Nov	Yellow grey gravel, sandy loam. Laterite, breakaways	Low	Yes	Low
Synaphea oulopha	P3		X		X	17.69	Jul - Oct	Grey sand, gravelly loam, clay. Lateritic breakaways and rises.[2]	Low	No	Low
Tecticornia fimbriata	P3		X		X	16.34		Clay, loam. Margins of salt and gypsum lakes.[2]	Low	No	Low
Thysanotus vernalis	P3		X		X	18.21	Sep - Oct	Sandy loam.[2]	Low	Yes	Low
Verticordia densiflora var. *roseostella*	P3		X		X	16.87	Sep - Dec	Grows in sandy, gravelly soils.[2]	Low	Yes	Low

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2024 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing. 1: Department of the Environment (2024). SPRAT EPBC Threatened Flora in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. 2: Department of Biodiversity, Conservation and Attractions (2024). FloraBase - TheWestern Australian Flora. https://florabase.dpaw.wa.gov.au/

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Pre-Survey Likelihood of Occurrence	Habitat occurs within the Survey Area	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Verticordia insignis subsp. *eomagis*	P3		X		X	12.81	Aug - Nov	Sandy soils over laterite. Sandplains, rocky rises.[2]	Low	Yes	Low
Verticordia luteola var. *luteola*	P3		X		X	9.29	Nov - Dec	Grey sand over gravel. Flats.[2]	Medium	No	Low
Verticordia muelleriana subsp. *muelleriana*	P3		X		X	7.38	Sep - Dec or Jan	White/grey or yellow sand. Sandplains.[2]	Medium	Yes	Medium
Banksia chamaephyton	P4		X		X	6.58	Oct - Dec	Grey or white sand over laterite.[2]	Medium	Yes	Medium
Calothamnus accedens	P4		X		X	12.16	Jan - Feb	Sandy soils over laterite, brown loam. Road verge.[2]	Low	Yes	Low
Calothamnus brevifolius	P4		X		X	18.69	Jan - Feb or Apr	White/grey or yellow sand.[2]	Low	Yes	Low
Calytrix chrysantha	P4		X		X	16.30	Dec or Jan - Feb	White, grey or yellow/brown sand. Flats.[2]	Low	Yes	Low
Desmocladus elongatus	P4		X		X	13.14	Aug - Dec	White or grey sand, sandy soil.[2]	Low	Yes	Low
Diuris recurva	P4		X		X	19.60	Jul - Aug	Loam. Winter-wet areas.[2]	Low	No	Low
Eucalyptus ebbanoensis subsp. *photina*	P4		X		X	14.32	Sep - Dec or Jan - Mar	Sandy clay, red sand. Lateritic breakaways, sandplains.[2]	Low	Yes	Low
Eucalyptus macrocarpa subsp. *elachantha*	P4		X		X	6.03	Aug - Sep or Nov - Dec	White or grey sand over laterite. Hillslopes, ridges, sandplains.[2]	Medium	Yes	Medium
Eucalyptus rhodantha var. x *petiolaris*	P4		X		X	12.43	Oct - Dec Jan	Sandy loam, laterite. Undulating country, hillslopes	Low	Yes	Low
Eucalyptus zopherophloia	P4		X		X	19.05	Oct - Dec or Jan	Grey/white sand with limestone rubble. Coastal areas.[2]	Low	No	Low
Grevillea rudis	P4		X		X	13.07	or Apr or Jun - Sep or Nov -	White, grey, yellow or red sand, often with gravel and over laterite.[2]	Low	Yes	Low
Hemiandra sp. Watheroo (S. Hancocks 4)	P4		X		X	7.18	Oct - Jan	white-grey sand on flat ground, the slopes of ridges or low hills in open low woodland with open scrub heath.[2]	Medium	Yes	Medium
Lepidobolus densus	P4		X		X	3.69	Aug or Sep	Yellow lateritic sand, lateritic gravel. Dry kwongan.[2]	High	No	Low

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2024 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing. 1: Department of the Environment (2024). SPRAT EPBC Threatened Flora in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. 2: Department of Biodiversity, Conservation and Attractions (2024). FloraBase - TheWestern Australian Flora. https://florabase.dpaw.wa.gov.au/

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Pre-Survey Likelihood of Occurrence	Habitat occurs within the Survey Area	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Pityrodia viscida	P4		X		X	7.43	Sep - Dec or Jan - Feb	Lateritic sand.[2]	Medium	No	Low
Schoenus griffinianus	P4		X		X	13.28	Sep - Oct	White sand.[2]	Low	Yes	Low
Schoenus natans	P4		X		X	17.06	Oct	Winter-wet depressions.[2]	Low	No	Low
Thelymitra apiculata	P4		X		X	5.86	May - Jul	Grey sand, lateritic gravel.[2]	Medium	No	Low
Verticordia penicillaris	P4		X		X	15.69	Sep - Oct	Shallow gritty soils. Granite outcrops.[2]	Low	No	Low

Appendix C Flora Inventory

Flora and Fauna Assessment

Killawarra Solar and BESS Project

Trina Solar

SLR Project No.: 675.072651.00003

1 April 2025

Family	Taxa
Anarthriaceae	*Lyginia imberbis*
Araliaceae	*Trachymene cyanopetala*
	Trachymene pilosa
Asparagaceae	*Lomandra hastilis*
Asteraceae	*Actinobole uliginosum*
	**Arctotheca calendula*
	Blennospora drummondii
	Hyalosperma demissum
	**Hypochaeris glabra*
	**Monoculus monstrosus*
	Podotheca gnaphalioides
	Siemssenia capillaris
	**Sonchus oleraceus*
	**Ursinia anthemoides* subsp. *anthemoides*
	Waitzia acuminata var. *acuminata*
Brassicaceae	*Raphanus raphanistrum*
Campanulaceae	*Wahlenbergia gracilenta*
Casuarinaceae	*Allocasuarina humilis*
Colchicaceae	*Burchardia congesta*
Crassulaceae	*Crassula colorata*
Cyperaceae	*Caustis dioica*
	Mesomelaena pseudostygia
	Schoenus clandestinus
Dilleniaceae	*Hibbertia hypericoides* subsp. *hypericoides*
Droseraceae	*Drosera humilis*
	Drosera magna
Ecdeiocoleaceae	*Ecdeiocolea monostachya*
Fabaceae	*Daviesia nudiflora*
	Gastrolobium spinosum
	Jacksonia floribunda
	Jacksonia hakeoides
	**Ornithopus compressus*
	**Trifolium campestre*
Geraniaceae	*Erodium cygnorum*
Goodeniaceae	*Dampiera spicigera*
Haloragaceae	*Glischrocaryon aureum*
Iridaceae	*Patersonia occidentalis*

Family	Taxa
Myrtaceae	*Apectospermum spinescens*
	Babingtonia camphorosmae
	Calothamnus quadrifidus
	Eremaea sp.
	Eucalyptus todtiana
	Leptospermopsis oligandra
	Melaleuca aspalathoides
	Melaleuca sp.
	Pileanthus filifolius
	Scholtzia laxiflora
	Verticordia grandis
	Verticordia sp.
Orchidaceae	*Caladenia flava*
	Elythranthera brunonis
Poaceae	*Austrostipa elegantissima*
	Austrostipa macalpinei
	**Avena barbata*
	**Bromus diandrus*
	**Ehrharta longiflora*
	Neurachne alopecuroidea
	**Pentameris airoides*
	**Vulpia myuros*
Proteaceae	*Banksia attenuata*
	Banksia kippistiana
	Banksia nivea
	Banksia prionotes
	Banksia sessilis
	Banksia shuttleworthiana
	Banksia sphaerocarpa
	Conospermum triplinervium
	Grevillea eriostachya
	Grevillea erinacea (P3)
	Hakea incrassata
	Hakea lissocarpha
	Petrophile brevifolia
	Petrophile shuttleworthiana
	Xylomelum angustifolium

Family	Taxa
Rutaceae	*Geleznowia verrucosa*
Scrophulariaceae	**Zaluzianskya divaricata*
Stylidiaceae	*Levenhookia pusilla*

Appendix D Flora Site Sheets

Flora and Fauna Assessment

Killawarra Solar and BESS Project

Trina Solar

SLR Project No.: 675.072651.00003

1 April 2025

FLORA SITE SHEET

Project Name Three Springs Wind Farm
Site: TSNR1
Location MGA 50 364375 **mE** 6716678 **mN**

Described by: NW
Date: 10/09/2024
Type: Releve



Landform: Undulating plain
Rock Type: Cream
Soil Type: Sand
Soil Colour: Cream

Vegetation: *Low open woodand of Eucalyptus todtiana and Xylomelum angustifolium over a tall open shrubland of Leptospermopsis oligandra, Banksia sphaerocarpa and Calothamnus quadrifidus over a tall open tussock grassland of Ecdeiocolea monostachya, *Ehrarta longiflora and *Avena barbata*

Condition: Very Good **Disturbance Type:** Weeds
Fire Age: >15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Actinobole uliginosum	2	0.1	
Allocasuarina humilis	120	0.2	
Apectospermum spinescens	100	1	
Arctotheca calendula	30	2	
Austrostipa elegantissima	90	0.2	
Austrostipa macalpinei	5	0.2	
Avena barbata	65	10	
Babingtonia camphorosmae	110	0.5	
Banksia attenuata	180	1.5	
Banksia kippistiana	90	1	
Banksia nivea	50	1.5	
Banksia sessilis	200	2	
Banksia shuttleworthiana	50	1	
Banksia sphaerocarpa	140	1.5	
Blennospora drummondii	5	0.5	
Burchardia congesta	45	0.1	
Caladenia flava	15	0.2	
Calothamnus quadrifidus	180	3	
Conospermum triplinervium	120	1	
Crassula colorata	3	0.1	
Daviesia nudiflora	60	1.5	
Drosera magna	50	0.1	
Ecdeiocolea monostachya	120	4	
Ehrharta longiflora	65	8	
Elythranthera brunonis	40	0.1	
Eremaea sp.	65	3	
Erodium cygnorum	5	0.5	
Eucalyptus todtiana	600	15	
Gastrolobium spinosum	100	1	
Geleznowia verrucosa	50	0.4	
Hakea incrassata	110	1.5	
Hakea lissocarpha	120	2	
Hibbertia hypericoides subsp. hypericoides	50	0.5	
Hypochaeris glabra	1	0.3	
Jacksonia floribunda	150	1	
Jacksonia hakeoides	50	1	
Leptospermopsis oligandra	250	3	
Levenhookia pusilla	3	0.1	
Melaleuca aspalathoides	50	2	
Melaleuca sp.	80	1.5	
Mesomelaena pseudostygia	40	0.3	
Patersonia occidentalis	40	0.4	
Pentameris airoides	10	0.2	
Petrophile shuttleworthiana	150	1.5	
Pileanthus filifolius	40	0.5	
Podotheca gnaphalioides	30	0.3	

Raphanus raphanistrum	50	0.3
Siemssenia capillaris	25	0.2
Sonchus oleraceus	1	0.2
Trachymene cyanopetala	15	0.2
Trachymene pilosa	20	0.2
Ursinia anthemoides subsp. anthemoides	25	3
Verticordia grandis	120	1
Vulpia myuros	25	3
Wahlenbergia gracilenta	25	0.1
Waitzia acuminata var. acuminata	30	0.2
Xylomelum angustifolium	500	3
Zaluzianskya divaricata	15	0.1

FLORA SITE SHEET

Project Name Three Springs Wind Farm
Site: TSNR2
Location MGA 50 364390 **mE** 6715415 **mN**



Described by: NW
Date: 10/09/2024
Type: Releve

Landform: Undulating plain
Rock Type: Yellow
Soil Type: Loam,Sand
Soil Colour: Yellow

Vegetation: *Low open woodand of Eucalyptus todtiana and Xylomelum angustifolium over a tall open shrubland of Leptospermopsis oligandra, Banksia sphaerocarpa and Calothamnus quadrifidus over a tall open tussock grassland of Ecdeiocolea monostachya, *Ehrarta longiflora and *Avena barbata*

Condition: Very Good **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Actinobole uliginosum	2	0.1	
Arctotheca calendula	15	0.3	
Austrostipa elegantissima	50	0.5	
Austrostipa macalpinei	5	0.1	
Banksia kippistiana	40	0.5	
Banksia prionotes	200	1.5	
Banksia shuttleworthiana	40	0.5	
Banksia sphaerocarpa	200	4	
Blennospora drummondii	3	0.1	
Bromus diandrus	25	0.3	
Burchardia congesta	15	0.1	
Caladenia flava	20	1	
Calothamnus quadrifidus	150	2	
Caustis dioica	50	0.8	
Crassula colorata	3	0.2	
Dampiera spicigera	25	3	
Drosera humilis	10	0.1	
Ecdeiocolea monostachya	110	5	
Ehrharta longiflora	40	10	
Eremaea sp.	50	3	
Erodium cygnorum	6	0.2	
Eucalyptus todtiana	800	2	
Geleznowia verrucosa	60	0.2	
Glischrocaryon aureum	40	0.3	
Grevillea eriostachya	300	3	
Hyalosperma demissum	1	0.1	
Hypochaeris glabra	1	2	
Jacksonia floribunda	200	1	
Leptospermopsis oligandra	350	15	
Levenhookia pusilla	2	0.1	
Lomandra hastilis	100	1.5	
Lyginia imberbis	40	1	
Melaleuca sp.	150	4	
Mesomelaena pseudostygia	80	1	
Monoculus monstrosus	30	0.1	
Neurachne alopecuroidea	15	0.2	
Ornithopus compressus	3	0.1	
Petrophile brevifolia	40	0.3	
Pileanthus filifolius	150	2	
Podotheca gnaphalioides	30	0.3	
Raphanus raphanistrum	50	0.3	
Schoenus clandestinus	2	0.2	
Scholtzia laxiflora	60	2	
Siemssenia capillaris	15	0.2	
Sonchus oleraceus	20	0.2	
Trachymene pilosa	10	0.2	

Trifolium campestre	10	0.1
Ursinia anthemoides subsp. anthemoides	20	0.2
Verticordia sp.	100	1
Vulpia myuros	15	2
Xylomelum angustifolium	500	1

Appendix E Fauna Database Search

Flora and Fauna Assessment

Killawarra Solar and BESS Project

Trina Solar

SLR Project No.: 675.072651.00003

1 April 2025

Conservation Status: State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation, Commonwealth - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR/CE - Critically Endangered, EN - Endangered, VU - Vulnerable, MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, Database: NM - NatureMap, PMST - EPBC Protected Matters Search Tool, DBCA - DBCA Threatened and Priority Fauna database search, Fi

Family	Scientific Name	Common Name	Conservation Status		Database			Field
			State	Commonwealth	NM	PMST	DBCA	
Aves								
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill, Broad-tailed Thornbill	-	-	2			
Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	-	-	11			
Acanthizidae	*Acanthiza uropygialis*	Chestnut-rumped Thornbill	-	-	3			
Acanthizidae	*Calamanthus cautus*	Shy Groundwren, Shy Heathwren	-	-	2			
Acanthizidae	*Gerygone fusca*	Western Gerygone	-	-	6			
Acanthizidae	*Pyrrholaemus brunneus*	Redthroat	-	-	4			
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren	-	-	5			
Acanthizidae	*Smicrornis brevirostris*	Weebill	-	-	5			
Accipitridae	*Aquila audax*	Wedge-tailed Eagle	-	-	5			1
Accipitridae	*Elanus axillaris*	Black-shouldered Kite	-	-	2			
Accipitridae	*Haliaeetus leucogaster*	White-bellied Sea-eagle	-	MA		1		
Accipitridae	*Hieraaetus morphnoides*	Little Eagle	-	-	1			
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar	-	-	1			
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra	-	-	1			
Alcedinidae	*Todiramphus sanctus*	Sacred Kingfisher	-	MA	2			
Anatidae	*Anas gracilis*	Grey Teal	-	-	4			
Anatidae	*Anas superciliosa*	Pacific Black Duck	-	-	2			
Anatidae	*Chenonetta jubata*	Australian Wood Duck, Wood Duck, Maned Duck	-	-	1			
Anatidae	*Cygnus atratus*	Black Swan	-	-	2			
Anatidae	*Oxyura australis*	Blue-billed Duck	P4	-			18	
Anatidae	*Tadorna tadornoides*	Australian Shelduck, Mountain Duck	-	-	3			
Apodidae	*Apus pacificus*	Pacific Swift, Fork-tailed Swift	MI	MI, MA		2	2	
Ardeidae	*Ardea pacifica*	White-necked Heron	-	-	2			
Ardeidae	*Bubulcus coromandus*	Eastern Cattle Egret	-	-		1		
Artamidae	*Artamus cinereus*	Black-faced Woodswallow	-	-	7			
Artamidae	*Artamus cyanopterus*	Dusky Woodswallow	-	-	1			
Artamidae	*Cracticus nigrogularis*	Pied Butcherbird	-	-	5			
Artamidae	*Cracticus torquatus*	Grey Butcherbird	-	-	2			
Artamidae	*Gymnorhina tibicen*	Australian Magpie	-	-	4			
Cacatuidae	*Cacatua leadbeateri*	Pink Cockatoo	-	-	2			
Cacatuidae	*Cacatua sanguinea*	Little Corella	-	-	1			
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU			2	
Cacatuidae	*Eolophus roseicapilla*	Galah	-	-	14			2
Cacatuidae	*Zanda latirostris*	Carnaby's Cockatoo	EN	EN	7		133	
Cacatuidae	*Zanda sp. 'white-tailed black cockatoo'*	-	EN	EN	1		57	
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike	-	MA	7			
Casuariidae	*Dromaius novaehollandiae*	Emu	-	-	2			
Charadriidae	*Anarhynchus ruficapillus*	Red-capped Plover	-	MA	1			
Charadriidae	*Charadrius melanops*	Black-fronted Dotterel	-	-	1			
Charadriidae	*Erythrogonys cinctus*	Red-kneed Dotterel	-	-	1			
Charadriidae	*Thinornis cucullatus*	Hooded Plover, Hooded Dotterel	-	-	1		11	
Charadriidae	*Vanellus tricolor*	Banded Lapwing	-	-	2			
Columbidae	*Ocyphaps lophotes*	Crested Pigeon	-	-	7			
Columbidae	*Phaps chalcoptera*	Common Bronzewing	-	-	4			
Corvidae	*Corvus coronoides*	Australian Raven	-	-	14			3
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	-	MA	1			
Cuculidae	*Chalcites osculans*	Black-eared Cuckoo	-	MA		1		
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird	-	-	1			
Estrildidae	*Taeniopygia castanotis*	Australian Zebra Finch	-	-	1			
Falconidae	*Falco cenchroides*	Nankeen Kestral	-	MA	9			3
Falconidae	*Falco longipennis*	Australian Hobby	-	-	1			
Falconidae	*Falco peregrinus*	Peregrine Falcon	OS	-	1		2	
Hirundinidae	*Cheramoeca leucosterna*	White-backed Swallow	-	-	2			
Hirundinidae	*Hirundo neoxena*	Welcome Swallow	-	MA	3			
Hirundinidae	*Petrochelidon nigricans*	Tree Martin	-	MA	10			
Laridae	*Chroicocephalus novaehollandiae*	Silver Gull	-	-	1			
Locustellidae	*Cincloramphus cruralis*	Brown Songlark	-	-	2			2
Locustellidae	*Cincloramphus mathewsi*	Rufous Songlark	-	-	2			
Maluridae	*Malurus assimilis*	Purple-backed Fairywren	-	-	6			
Maluridae	*Malurus leucopterus*	White-winged Fairywren	-	-	7			

Family	Scientific Name	Common Name	Conservation Status		Database			Field
			State	Commonwealth	NM	PMST	DBCA	
Maluridae	*Malurus pulcherrimus*	Blue-breasted Fairywren	-	-	1			
Maluridae	*Malurus sp.*	-	-	-	1			
Maluridae	*Malurus splendens*	Splendid Fairywren	-	-	3			
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU	3		29	
Meliphagidae	*Acanthagenys rufogularis*	Spiny-cheeked Honeyeater	-	-	4			
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	-	-	2			
Meliphagidae	*Anthochaera lunulata*	Western Little Wattlebird, Western Wattlebird	-	-	4			
Meliphagidae	*Certhionyx variegatus*	Pied Honeyeater	-	-	2			
Meliphagidae	*Epthianura albifrons*	White-fronted Chat	-	-	5			
Meliphagidae	*Gavicalis virescens*	Singing Honeyeater	-	-	10			
Meliphagidae	*Gliciphila melanops*	Tawny-crowned Honeyeater	-	-	12			1
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater	-	-	19			
Meliphagidae	*Manorina flavigula*	Yellow-throated Miner	-	-	3			
Meliphagidae	*Phylidonyris niger*	White-cheeked Honeyeater	-	-	14			
Meliphagidae	*Sugomel nigrum*	Black Honeyeater	-	-	3			
Meropidae	*Merops ornatus*	Rainbow Bee-eater	-	MA		1		
Monarchidae	*Grallina cyanoleuca*	Magpie-lark	-	MA	9			
Motacillidae	*Anthus australis*	Australian Pipit	-	-				4
Motacillidae	*Motacilla cinerea*	Grey Wagtail	MI	MI, MA		2		
Oreoicidae	*Oreoica gutturalis*	Crested Bellbird	-	-	1			
Otididae	*Ardeotis australis*	Australian Bustard	-	-	1			
Pachycephalidae	*Colluricincla harmonica*	Grey Shrikethrush	-	-	6			
Pachycephalidae	*Pachycephala pectoralis*	Golden Whistler	-	-	2			
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler	-	-	4			
Pardalotidae	*Pardalotus striatus*	Striated Pardalote	-	-	4			
Petroicidae	*Melanodryas cucullata*	Hooded Robin	-	-	1			
Petroicidae	*Petroica goodenovii*	Red-capped Robin	-	-	8			
Podicipedidae	*Poliocephalus poliocephalus*	Hoary-headed Grebe	-	-	2			
Podicipedidae	*Tachybaptus novaehollandiae*	Australasian Grebe, Black-throated Grebe	-	-	2			
Psittaculidae	*Barnardius zonarius*	Australian Ringneck	-	-	13			
Psittaculidae	*Pezoporus wallicus flaviventris*	Western Ground Parrot	CR	CE	1		1	
Recurvirostridae	*Cladorhynchus leucocephalus*	Banded Stilt	-	-	1			
Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	-	MA	4			
Recurvirostridae	*Recurvirostra novaehollandiae*	Red-necked Avocet	-	MA	4			
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	-	-	2			
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail	-	-	7			1
Rostratulidae	*Rostratula australis*	Australian Painted Snipe	EN	EN, MA		1		
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	MI	MI, MA		2	1	
Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	MI	VU, MI, MA		2	4	
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	CR	CE, MI, MA		2	4	
Scolopacidae	*Calidris melanotos*	Pectoral Sandpiper	MI	MI, MA		2		
Scolopacidae	*Calidris ruficollis*	Red-necked Stint	MI	MI, MA			8	
Scolopacidae	*Tringa glareola*	Wood Sandpiper	MI	MI, MA			3	
Scolopacidae	*Tringa nebularia*	Common Greenshank	MI	EN, MI, MA			16	
Scolopacidae	*Xenus cinereus*	Terek Sandpiper	MI	VU, MI, MA			1	
Strigidae	*Ninox boobook boobook*	Southern Boobook	-	MA	1			
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	MI	MI, MA			5	
Zosteropidae	*Zosterops lateralis*	Grey-breasted White-eye, Silvereye	-	MA	7			
Mammalia								
Canidae	*Canis familiaris*	Dingo / Dog	-	-	1			
Dasyuridae	*Dasyurus geoffroii fortis*	Western Quoll, Chuditch	VU	VU		1		
Dasyuridae	*Parantechinus apicalis*	Dibbler	EN	EN		1		
Dasyuridae	*Phascogale tapoatafa wambenger*	Wambenger Brush-tailed Phascogale	CD	-			1	
Dasyuridae	*Sminthopsis crassicaudata*	Fat-tailed Dunnart	-	-	2			
Dasyuridae	*Sminthopsis dolichura*	Little Long-tailed Dunnart	-	-	1			
Dasyuridae	*Sminthopsis granulipes*	White-tailed Dunnart	-	-	1			
Megadermatidae	*Macroderma gigas*	Ghost Bat	VU	VU		1	2	
Molossidae	*Austronomus australis*	White-striped Free-tailed Bat	-	-	1			
Muridae	*Mus musculus*	House Mouse	-	-	4			
Muridae	*Pseudomys albocinereus*	Ash-grey Mouse	-	-	2			
Pseudocheiridae	*Pseudocheirus occidentalis*	Western Ringtail Possum	CR	CE			1	
Tarsipedidae	*Tarsipes rostratus*	Honey Possum, Noolbenger	-	-	1			
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat	-	-	1			
Vespertilionidae	*Nyctophilus geoffroyi geoffroyi*	Lesser Long-eared Bat	-	-	1			
Reptilia								
Agamidae	*Ctenophorus maculatus*	Spotted Sand Dragon	-	-	5			
Agamidae	*Moloch horridus*	Thorny Devil	-	-	1			
Elapidae	*Neelaps calonotos*	Black-striped Snake	P3	-			1	

Family	Scientific Name	Common Name	Conservation Status		Database			Field
			State	Commonwealth	NM	PMST	DBCA	
Elapidae	*Pseudonaja affinis*	Dugite	-	-	1			
Pythonidae	*Aspidites ramsayi*	Woma	P1	-			3	
Scincidae	*Egernia stokesii badia*	Western Spiny-tailed Skink	VU	EN		1	10	
Scincidae	*Tiliqua rugosa*	Bobtail	-	-	1			

Appendix F Fauna Habitat Site

Flora and Fauna Assessment

Killawarra Solar and BESS Project

Trina Solar

SLR Project No.: 675.072651.00003

1 April 2025

TSNR1

Project	Three Springs			Latitude	-29.6725384	Longitude	115.5984454
Date	10-09-2024	Sample Type	Terrestrial vertebrate fauna - Habitat Assesment			Weather	Overcast

Landform and Soil		Rock	
Landform	Undulating plain	Rock type/s	None
Aspect	East	Pebble/stone cover	None
Soil type	Sand	Rock/boulder cover	None
Soil colour	Yellow	Outcropping cover	None
Condition		**Habitat Features**	
Quality	Very Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Leaf litter, overgrown vegetation, woody debris
Disturbance	Weeds		
Introduced fauna	None	Leaf litter cover	0-10%

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*Eucalyptus todtiana and Xylomelum angustifolium*
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (20-50%)	*Leptospermopsis oligandra, Banksia sphaerocarpa and Calothamnus quadrifidus*
Ground stratum	Low (>0.5 m)	Open Tussock Grassland	*Ecdeiocolea monostachya, Ehrarta longiflora*



Fulcrum photo ID	aa9d27c8-bc29-4a52-b666-9c007443645c,85fe97dc-c87a-471c-b64c-

TSNR2

Project	Three Springs			Latitude	-29.6839333	Longitude	115.5984483
Date	10-09-2024	Sample Type	Terrestrial vertebrate fauna - Habitat Assesment			Weather	Overcast

Landform and Soil		Rock	
Landform	Undulating plain	Rock type/s	None
Aspect	East	Pebble/stone cover	None
Soil type	Loam,Sand	Rock/boulder cover	None
Soil colour	Yellow	Outcropping cover	None
Condition		**Habitat Features**	
Quality	Very Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Woody Debris
Disturbance	Weeds		
Introduced fauna	None	Leaf litter cover	0-10%

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*Eucalyptus todtiana and Xylomelum angustifolium*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Leptospermopsis oligandra, Banksia sphaerocarpa and Calothamnus quadrifidus*
Ground stratum	Low (>0.5 m)	Open Tussock Grassland	*Ecdeiocolea monostachya, Ehrarta longiflora*



Fulcrum photo ID	b2043bdf-7877-4bde-8b39-577b1670f5c9,77cd035f-ab13-4f97-b77a-

Appendix G Fauna Likelihood Table

Flora and Fauna Assessment

Killawarra Solar and BESS Project

Trina Solar

SLR Project No.: 675.072651.00003

1 April 2025

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Birds						
Anatidae	*Oxyura australis* Blue-billed Duck	P4	-	Densely vegetated freshwater lakes, swamps, dams (Morcombe, 2003).	The DBCA database identified 18 records within 50 km of the Survey Area, including 39 km southeast in 1999 and 45.5 km southwest in 2003 (DBCA, 2024c).	**Low** No suitable habitat within the Survey Area. No recent nearby records.
Apodidae	*Apus pacificus* Pacific Swift, Fork-tailed Swift	MI	MI, MA	Low to very high airspace over varied habitat (Pizzey and Knight, 2012).	The DBCA database identified two records within 50 km of the Survey Area, including 21.3 km north in 1978 and 47.9 km northeast in 2000 (DBCA, 2024c).	**Low** No suitable habitat within the Survey Area. No recent nearby records.
Cacatuidae	*Calyptorhynchus banksii naso* Forest Red-tailed Black Cockatoo	VU	VU	Tall eucalypt forest, woodland, feeds on seeds of large-fruited eucalypts (Menkhorst et al., 2017).	The DBCA database identified two records within 50 km of the Survey Area, including 29.2 km east in 2021 and 38.2 km southeast in 1966 (DBCA, 2024c).	**Low** Survey Area occurs outside species distribution. No nearby records.
Cacatuidae	*Zanda latirostris* Carnaby's Cockatoo	EN	EN	Forests, woodlands, heathlands, farms; feeds on Banksias and Hakeas, pine plantations (Morcombe, 2003).	The DBCA database identified 133 records within 50 km of the Survey Area, including 10 km northeast in 2001 and 36.1 km southwest in 2021 (DBCA, 2024c).	**High** Survey Area contains limited suitable foraging habitat.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Cacatuidae	*Zanda sp. 'white-tailed black cockatoo'* -	EN	EN	Forests, woodlands, heathlands, farms; feeds on Banksias and Hakeas, pine plantations (Morcombe, 2003).	The DBCA database identified 57 records within 50 km of the Survey Area, including 17.6 km southwest in 1977 and 20.2 km southwest in 1982 (DBCA, 2024c).	**High** Records are assumed as Carnaby's Cockatoo.
Falconidae	*Falco peregrinus* Peregrine Falcon	OS	-	Most environments with suitable nest sites: cliff faces preferred, including man-made ones, commonly uses stick nests built by other species (Menkhorst et al., 2017).	The DBCA database identified 57 records within 50 km of the Survey Area, including 10.5 km north in 2011 and 35 km northwest in 2002 (DBCA, 2024c).	**Low** No recent nearby records. Species may use the airspace above the Survey Area for hunting.
Megapodiidae	*Leipoa ocellata* Malleefowl	VU	VU	Mallee, acacia, paperbark, she-oak and other scrubs; eucalypt woodland; coastal heath; mostly on sandy or gravel soils (Pizzey and Knight, 2012).	The DBCA database identified 29 records within 50 km of the Survey Area, including 15.7 km north in 2005 and 23.7 km northeast in 2016 (DBCA, 2024c).	**Medium** Nearby recent records, however Survey Area lacks large areas of suitable habitat.
Motacillidae	*Motacilla cinerea* Grey Wagtail	MI	MI, MA	Running water near disused quarries; sandy, rocky streams in escarpments; sewage ponds, ploughed fields, airfields (Pizzey and Knight 2012).	No nearby records identified from the database searches or literature. Species only returned from PMST which measures distribution, not individual records (DCCEEW, 2024).	**Low** No recent records or suitable habitat present within the Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Psittaculidae	*Pezoporus wallicus flaviventris* Western Ground Parrot	CR	CE	Coastal heathlands with diverse low-growing shrubs. (Pizzey and Knight 2012).	The DBCA database identified one historical record within 50 km of the Survey Area, including 11 km southwest (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.
Rostratulidae	*Rostratula australis* Australian Painted Snipe	EN	EN, MA	Well-vegetated shallows and margins of wetlands, dams, sewage ponds; wet pastures, marshy areas, irrigation systems, lignum, tea-tree scrub, open timber (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature. Species only returned from PMST which measures distribution, not individual records (DCCEEW, 2024).	**Low** No recent records or suitable habitat present within the Survey Area.
Scolopacidae	*Actitis hypoleucos* Common Sandpiper	MI	MI, MA	Shallow, pebbly, muddy or sandy sedges of rivers and streams, coastal to far inland; dams, lakes, sewage ponds; margins of tidal rivers; waterways in mangroves or saltmarsh; mudflats; rocky or sandy beaches; causeways, riverside lawns, drains, street gutters (Pizzey and Knight, 2012).	The DBCA database identified one record within 50 km of the Survey Area, occurring 46.4 km southwest in 2002 (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.
Scolopacidae	*Calidris acuminata* Sharp-tailed Sandpiper	MI	VU, MI, MA	Tidal mudflats, saltmarshes, mangroves; shallow fresh, brackish or saline inland wetlands; muddy edges of lagoons, swamps, lakes, floodwaters, dams, irrigated pastures and crops; sewage ponds, saltfields (Morcombe, 2003; Pizzey and Knight, 2012).	The DBCA database identified four records within 50 km of the Survey Area, including 19.6 km northeast in 1981 and 46.4 km southwest in 1997 (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	*Calidris ferruginea* Curlew Sandpiper	CR	CE, MI, MA	Inter-tidal mudflats of estuaries, lagoons, mangrove channel; saltmarsh, saltfields; fresh, brackish or saline wetlands; flooded saltbush surrounds of inland lakes; dams, floodwaters, sewage ponds (Morcombe, 2003; Pizzey and Knight, 2012).	The DBCA database identified four records within 50 km of the Survey Area, including 19.6 km northeast in 1981 and 45.6 km southwest in 2003 (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.
Scolopacidae	*Calidris melanotos* Pectoral Sandpiper	MI	MI, MA	Shallow fresh waters, often with low grass or other herbage; swamp margins, flooded pastures, sewage ponds; occasionally tidal areas, saltmarshes (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature. Species only returned from PMST which measures distribution, not individual records (DCCEEW, 2024).	**Low** No recent records or suitable habitat present within the Survey Area.
Scolopacidae	*Calidris ruficollis* Red-necked Stint	MI	MI, MA	Tidal mudflats, saltmarshes, sandy or shelly beaches; saline and freshwater wetlands, salt fields, sewage ponds (Pizzey and Knight, 2012).	The DBCA database identified eight records within 50 km of the Survey Area, including 19.6 km northeast in 1981 and 45.6 km southwest in 2004 (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.
Scolopacidae	*Tringa glareola* Wood Sandpiper	MI	MI, MA	Muddy margins of wetlands with emergent sedges and taller fringing vegetation; tidal mangroves; margins of tidal mudflats; saltmarshes, sewage pond (Pizzey and Knight, 2012; Menkhorst et al., 2017).	The DBCA database identified three records within 50 km of the Survey Area, including 45.8 km southwest in 2010 and 46.4 km southwest in 1997 (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	*Tringa nebularia* Common Greenshank	MI	EN, MI, MA	Mudflats, estuaries, saltmarshes, swamps, margins of lakes, muddy shallows of lagoons; permanent and temporary wetlands, claypans; commercial saltfield, irrigated crops, sewage ponds (Morcombe, 2003; Pizzey and Knight, 2012).	The DBCA database identified 16 records within 50 km of the Survey Area, including 21.3 km southwest in 1978 and 45.6 km southwest in 2004 (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.
Scolopacidae	*Xenus cinereus* Terek Sandpiper	MI	VU, MI, MA	Tidal mudflats, estuaries; shores and reefs of islands; coastal swamps, commercial saltfields (Pizzey and Knight, 2012).	The DBCA database identified one record within 50 km of the Survey Area, occurring 46.4 km southwest in 1997 (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.
Threskiornithidae	*Plegadis falcinellus* Glossy Ibis	MI	MI, MA	Well-vegetated wetlands, wet pastures, ricefields, flooded waters, floodplains; brackish or occasionally saline wetlands, mangroves, mudflats, occasionally dry grasslands (Pizzey and Knight, 2012).	The DBCA database identified five records within 50 km of the Survey Area, including 46.4 km southwest in 2004 and 2000 (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.
Mammals						
Dasyuridae	*Dasyurus geoffroii fortis* Western Quoll, Chuditch	VU	VU	Areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck and Strahan, 2008).	No nearby records identified from the database searches or literature. Species only returned from PMST which measures distribution, not individual records (DCCEEW, 2024).	**Low** No recent records or suitable habitat present within the Survey Area

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Dasyuridae	*Parantechinus apicalis* Dibbler	EN	EN	Dense, long unburnt vegetation with a thick litter layer and sandy soils (DBCA, 2012). Mature mallee-heath on mainland; low heath and scrubland on islands (Van Dyck, Gynther and Baker, 2013).	No nearby records identified from the database searches or literature. Species only returned from PMST which measures distribution, not individual records (DCCEEW, 2024).	**Low** No recent records or suitable habitat present within the Survey Area.
Dasyuridae	*Phascogale tapoatafa wambenger* Wambenger Brush-tailed Phascogale	CD	-	Arboreal with most successful foraging using mature, rough-barked trees, large logs and dead standing trees. Formerly occurred throughout the dry sclerophyll forests and woodlands of temperate and tropical Australia, preferring open forest with sparse groundcover, but uses habitats ranging from mallee to rainforest (Van Dyck and Strahan, 2008).	The DBCA database identified one record within 50 km of the Survey Area, occurring 34.6 km north in 2000 (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.
Megadermatidae	*Macroderma gigas* Ghost Bat	VU	VU	Deep caves and mines, and occasionally rock fissures and boulder piles occurring within a widespread but patchy distribution across northern Australia from the arid Pilbara to the lush rainforests of north Queensland (Baker and Gynther, 2023).	The DBCA database identified two records within 50 km of the Survey Area, both of which occurred 34.1 km southwest in 2007 (DBCA, 2024c).	**Low** Survey Area is situated outside species distribution.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Pseudocheiridae	*Pseudocheirus occidentalis* Western Ringtail Possum	CR	CE	Moist SW corner of WA. Coastally associated with Peppermint and Tuart communities. Away from the coast, found in Jarrah, Wandoo and Marri forests (Van Dyck, Gynther and Baker, 2013).	The DBCA database identified one record within 50 km of the Survey Area, occurring 36 km northwest in 2021 (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.
Reptiles						
Elapidae	*Neelaps calonotos* Black-striped Snake	P3	-	Dunes and sand-plains vegetated with heaths and eucalypt/banksia woodlands. Restricted to sandy coastal strip near Perth, WA between Mandurah and Cataby, with isolated populations further north near Eneabba and Dongara (Wilson and Swan, 2021).	The DBCA database identified one record within 50 km of the Survey Area, occurring 44.3 km southwest in 2007 (DBCA, 2024c).	**Low** Survey Area contains limited suitable habitat, however there are no nearby recent records.
Pythonidae	*Aspidites ramsayi* Woma	P1	-	Woodlands, heaths, and shrublands, often with spinifex. Shelters mainly in abandoned monitor and mammal burrows and in soil cracks (Wilson and Swan, 2021).	The DBCA database identified three records within 50 km of the Survey Area, occurring 33.9 km east in 1950 and 45.1 km northeast in 1967 (DBCA, 2024c).	**Low** No recent records or suitable habitat present within the Survey Area.
Sincidae	*Egernia stokesii badia* Western Spiny-tailed Skink	VU	EN	Occupies rock crevices and hollow timber in southwest interior of WA and on Dirk Hartog Island, Shark Bay (Wilson and Swan, 2021).	The DBCA database identified ten records within 50 km of the Survey Area, occurring 23.1 km northeast in 1945 and 24.7 km west in 2014 (DBCA, 2024c).	**Medium** Three records of the species within the previous 15 years. Limited suitable habitat present within the Survey Area.

Appendix H – Bushfire Management Plan

Bushfire management plan / statement addressing the bushfire protection criteria coversheet

Site address: Lot 10896 Turkey Flat Road, Kadathinni

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 6 Month Dec Year 2024

Report author or reviewer: Linden Wears

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☐ Level 3 practitioner ☑

If accredited please provide the following.

BPAD accreditation number: 19809 Accreditation expiry: Month June Year 2026

Bushfire management plan version number: Rev 0

Bushfire management plan date: Day 27 Month March Year 2025

If one or more of the following are selected, then these should be automatically referred to DFES	YES	NO
Strategic planning is required to address SPP 3.7 and the Guidelines	☐	☑
The application is a vulnerable land use	☐	☑

None of the Above ☑

If one or more of the following are selected, and the decision-maker requires input form DFES, then the application can be referred.	YES	NO
The BAL rating has been calculated by a method other than Method 1 as prescribed by AS 3959	☐	☑
An outcomes-based approach has been submitted to demonstrate compliance with the bushfire protection criteria	☐	☑

None of the Above ☑

Note: If a subdivision or development application meets all the acceptable solutions and does not otherwise trigger a referral as listed above, seeking advice from DFES on SPP 3.7 or other matters is at the discretion of the decision-maker.

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author or reviewer 

Date 27 March 2025

Trina Solar – Tathra Solar and BESS Facility

Lot 10896 Turkey Flat Road, Kadathinni

Bushfire Management Plan

Date: 27 March 2025

Prepared For: SLR Consulting Pty Ltd

Linfire Ref: 20240919380SLR-BMP-001_0

Linfire Consultancy

ABN: 577 930 47299

Revision	Issue Date	Revision Description	Approved By
0	27 Mar 2025	Issued for Approval	Linden Wears (Level 3 BPAD 19809)

Disclaimer and Limitation

This report is prepared solely for the nominated client, and any future residents of the subject lot(s), and is not for the benefit of any other person and may not be relied upon by any other person.

To the maximum extent permitted by the law, Linfire Consultancy, its employees, officers, agents and the writer ("Linfire") excludes all liability whatsoever for:

1. claim, damage, loss or injury to any property and any person caused by fire or as a result of fire or indeed howsoever caused;
2. errors or omissions in this report except where grossly negligent; and the proponent expressly acknowledges that they have been made aware of this exclusion and that such exclusion of liability is reasonable in all the circumstances.

If despite the provisions of the above disclaimer Linfire is found liable then Linfire limits its liability to the lesser of the maximum extent permitted by the law and the proceeds paid out by Linfire's professional or public liability insurance following the making of a successful claim against such insurer.

Fire is an unpredictable force of nature. Changing climatic factors (whether predictable or otherwise) either before or at the time of a fire can also significantly affect the nature of a fire and in a bushfire prone area it is not possible to completely guard against bushfire. The mitigation strategies contained in this Bushfire Management Plan (BMP) are considered to be prudent minimum standards only, based on the standards prescribed by relevant authorities. It is expressly stated that Linfire do not guarantee that if such standards are complied with or if a property owner exercises prudence, that a building or property will not be damaged or that lives will not be lost in a bush fire.

Further, the achievement of the level of implementation of fire precautions will depend on the actions of the landowner or occupiers of the land, over which Linfire has no control. If the proponent becomes concerned about changing factors then either a review of the existing BMP, or a new BMP, should be requested. Linfire accepts no liability or responsibility whatsoever for or in respect of any use or reliance upon this report and its supporting material by any third party.

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1.0 Proposal details

1.1 Background

Trina Solar (the Proponent) is seeking to lodge a development application (DA) the proposed solar and Battery Energy Storage (BESS) facility on Lot 10896 on Plan 210818, Turkey Flat Road, Kadathinni (the project area), in the Shire of Three Springs.

The proposed facility will require the installation of the following buildings and infrastructure (see Figure 1):

- O&M Building
- Storage/Maintenance Building
- Storage/Workshop Building (within BESS yard)
- 500 MW solar photovoltaic (PV) array and 114 inverter stations
- Centralised BESS (400 MW)
- Substation and Switchyard
- Firewater Tanks
- Internal Roads

Regarding onsite personnel, once operational, the following is expected:

- Occupant numbers likely to be 2 to 4 staff, 5 days a week (business hours)
- There will be at least one on-call technician allocated to the facility for all other times

1.2 Site description

The project area is approximately 624.2 ha of existing agricultural land within Lot 10896, and is surrounded by the following (see Figure 2 and Figure 3):

- To the south is the balance of Lot 10896, which is primarily scrub vegetation, with some grassland near Turkey Flat Road from previous clearing.
- Turkey Flat Road and verge to the east, with agricultural lots on No.1534 (Lot 10898) and No.1088 (Lot 10901) Turkey Flat Road further to the east, which contain mainly grassland but with larger plots of scrub vegetation
- Unmanaged grassland with isolated plots of scrub/forest vegetation to the north within agricultural lot No.3688 (Lot 10897) Eneabba-Three Springs Road, with Eneabba-Three Springs Road further north.
- Agricultural lot No.3282 (Lot 10895) Eneabba-Three Springs Road to the west, containing grassland areas, as well as significant plots of scrub and woodland vegetation.

Within the project area is an existing transmission line and associated 60 m wide easement, that runs from the south-west corner through to the central northern part of the project area.

Vehicular access to the project area is via Turkey Flat Road, which extends north to Three Springs-Eneabba Road, and south to Carnamah-Eneabba Road.

There is no existing reticulated town main water supply in the local area, nor any existing street hydrants.

1.3 Purpose

1.3.1 Current Bushfire Regulatory Requirements

As portions of the project area are designated as bushfire prone as per the *Map of Bush Fire Prone*

Areas (DFES 2024; see Plate 1), should any permanent buildings be sited in these areas, the proposal would need to be assessed against *State Planning Policy 3.7: Bushfire* (SPP 3.7; Western Australia Planning Commission (WAPC) 2024) and the *Planning for Bushfire Guidelines* (the WA Guidelines; WAPC 2024).

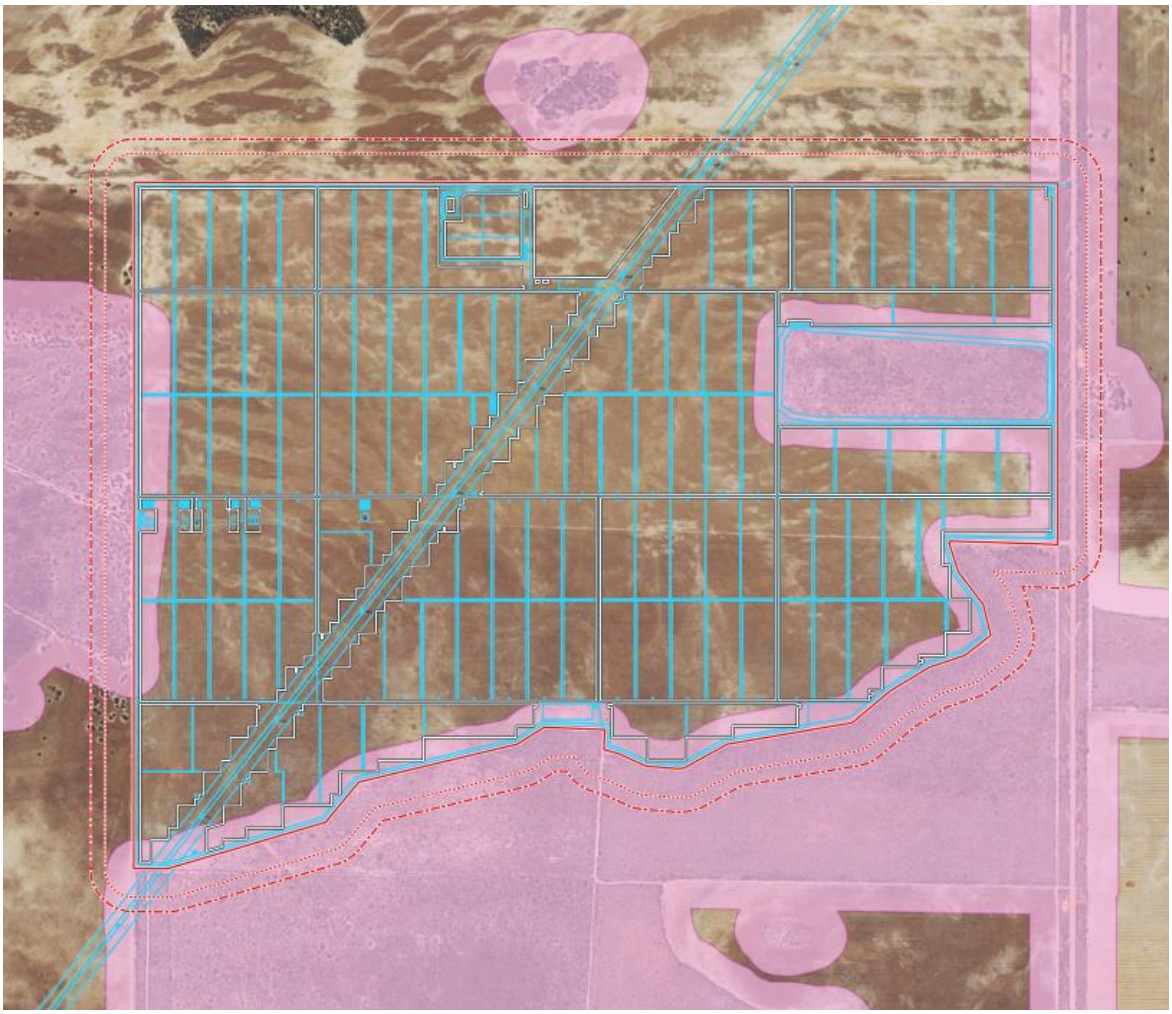


Plate 1: Map of Bush Fire Prone Areas (DFES 2025)

In accordance with Bushfire Protection Criteria 7 (BPC 7; Development – Commercial and Industrial) of the WA Guidelines, application of SPP 3.7 and the WA Guidelines applies only to buildings that are designated bushfire prone, and have a pre-development radiant heat impact of BAL-40/FZ (i.e., prior to management measures such as Asset Protection Zones).

The permanent buildings proposed as part of this project are sited outside the designated bushfire prone area within the project area, and on this basis, there is no formal trigger to assess the proposal against SPP 3.7 and the WA Guidelines. However, given building siting is surrounded by unmanaged grassland, it would likely have a pre-development rating of BAL-40/FZ which could occur without appropriate vegetation management measures.

Application of SPP3.7 and the WA Guidelines is only required for "habitable buildings" as defined in WA Planning Regulations, and given the renewable energy infrastructure (e.g. BESS and solar) are not considered "habitable building", assessment is not triggered, however the following is noted:

- As compliance with SPP 3.7 and the WA Guidelines isn't triggered for proposed renewable energy infrastructure, there is no statutory requirement for this infrastructure to comply with any specific requirements.
    - It is noted that BPC 7 of the WA Guidelines does make reference to hazardous,

flammable or combustible materials (under A2.4), which applies at some level to the proposed BESS containers which contain Li-ion batteries (or similar), however other parts of the renewable energy infrastructure are not captured under this clause.

- Current referral advice typically provided by DFES is that strict compliance is unlikely to be required or achieved with SPP 3.7 and the WA Guidelines, however application of the Country Fire Authority *Design Guidelines for Renewable Energy Facilities v4* (the CFA Guidelines; CFA 2023), provides the best design guidance for these type of renewable energy facilities at this stage.
    - It is noted that the CFA Guidelines currently has no formal status in WA, however it is understood DFES are currently in the process of drafting their own version of the CFA Guidelines, and while the timing of this is unconfirmed, the content is expected to broadly align with that from the CFA.
    - The CFA Guidelines contains guidance and what it terms “Model Requirements” for all renewable energy facilities as well as specific measures for wind, solar, battery energy storage (BESS) and substation/electric line infrastructure. It contains a number of sections pertaining to proposed design, construction, commissioning and operational requirements these facilities.
    - A key requirement is that a Risk Management Plan (RMP) is developed for renewable energy facilities.
- The WAPC have release a Position Statement on Renewable Energy Facilities (principally wind turbine and solar array systems), providing some high-level guidance as follows:
    - The objectives of the position statement include facilitate appropriate development of renewable energy facilities while minimising any potential impact upon the environment, natural landscape, and urban areas.
    - Wind turbines and solar arrays in bushfire prone areas should be designed and maintained so they are not a bushfire risk to surrounding bushland, and where possible should not be in bushfire prone areas with an ‘extreme’ bushfire hazard level or bushfire attack level (BAL) - 40 or BAL- Flame Zone.
    - A minimum 10 metres clearance to combustible vegetation in the form of an Asset Protection Zone (APZ) is recommended, which should be managed in a low threat state, in accordance with the WA Guidelines.

1.3.2 Bushfire Compliance Approach

Based on the regulatory requirements detailed in Section 1.3.1, the following bushfire compliance approach is proposed:

- Given the proposed buildings are not sited in a designated bushfire prone area, there is no formal requirement to assess the proposal against, and demonstrate compliance with SPP 3.7 and the WA Guidelines, however given the project area is surrounded by unmanaged grassland such that the initial BAL impact on buildings and infrastructure would be BAL-40 or greater, the Proponent has elected to voluntarily respond to the bushfire risk through demonstrating compliance with SPP 3.7 and the WA Guidelines as much as practical. This is to be documented in the project Bushfire Management Plan (BMP), the contents of which are detailed below;
- A Bushfire Risk Management Plan (BRMP) that accompanies this BMP, assesses the level of compliance of the proposed renewable infrastructure, against the relevant Model Requirements of the CFA Guidelines, to demonstrate the bushfire risk has been appropriately managed.
    - While the Risk Management Plan required by the CFA Guidelines is expected to address both structural fires and bushfires, the focus of the BRMP is to

address the bushfire-related risk to (and from) the proposed renewable energy infrastructure.

This Bushfire Management Plan (BMP) has been prepared to address requirements for development applications under SPP 3.7 Policy Measure 7.1 (ii) and Section 2.2 the WA Guidelines, in addition to Section 7 relating to Commercial/Industrial developments, including:

- The identification of any environmental, biodiversity or conservation values on the subject site(s).
    - Where relevant, details on how the clearing of native vegetation specifically for bushfire mitigation to achieve the bushfire protection measures, can be avoided through the use of siting and design measures.
    - Where the clearing of native vegetation cannot be avoided, details on how the proposal will minimise the clearing are to be provided.
- A BAL Contour Map or BAL assessment.
- The identification of any bushfire hazard issues arising from the assessment.
- Assessment against Bushfire Protection Criteria 7 (Development – Commercial and Industrial) demonstrating compliance of the following for proposed buildings:
    - Siting of all buildings in BAL-29 or lower, including provision of suitably sized Asset Protection Zones (APZ's; low fuel zones around buildings).
    - Justification of any native vegetation clearing to implement the APZ
    - Siting of all hazardous, flammable and/or combustible materials in BAL-29 or lower, and appropriate protection from radiant heat impact.
    - Provision of compliant vehicular access
    - Provision of suitable firewater supply.

The focus of this BMP is to demonstrate compliance of the proposed buildings with SPP 3.7 and the WA Guidelines, accompanied by a summary of the bushfire management measures for the renewable energy infrastructure derived from the project BRMP, to provide a complete summary of the Proponents bushfire risk management obligations for this project.

1.4 Other plans/reports

There are no known bushfire reports or assessments that have been prepared previously for the project area.

Linfire has prepared a Bushfire Risk Management Plan (Linfire 2025) detailing the level of compliance of the proposed renewable infrastructure, against the CFA Guidelines. The resultant bushfire management measures from the BRMP, have been incorporated into Section 5.0 of the BMP, to provide a collated summary of all risk management measures required for the proposed development. The BRMP should be read in conjunction within this BMP.

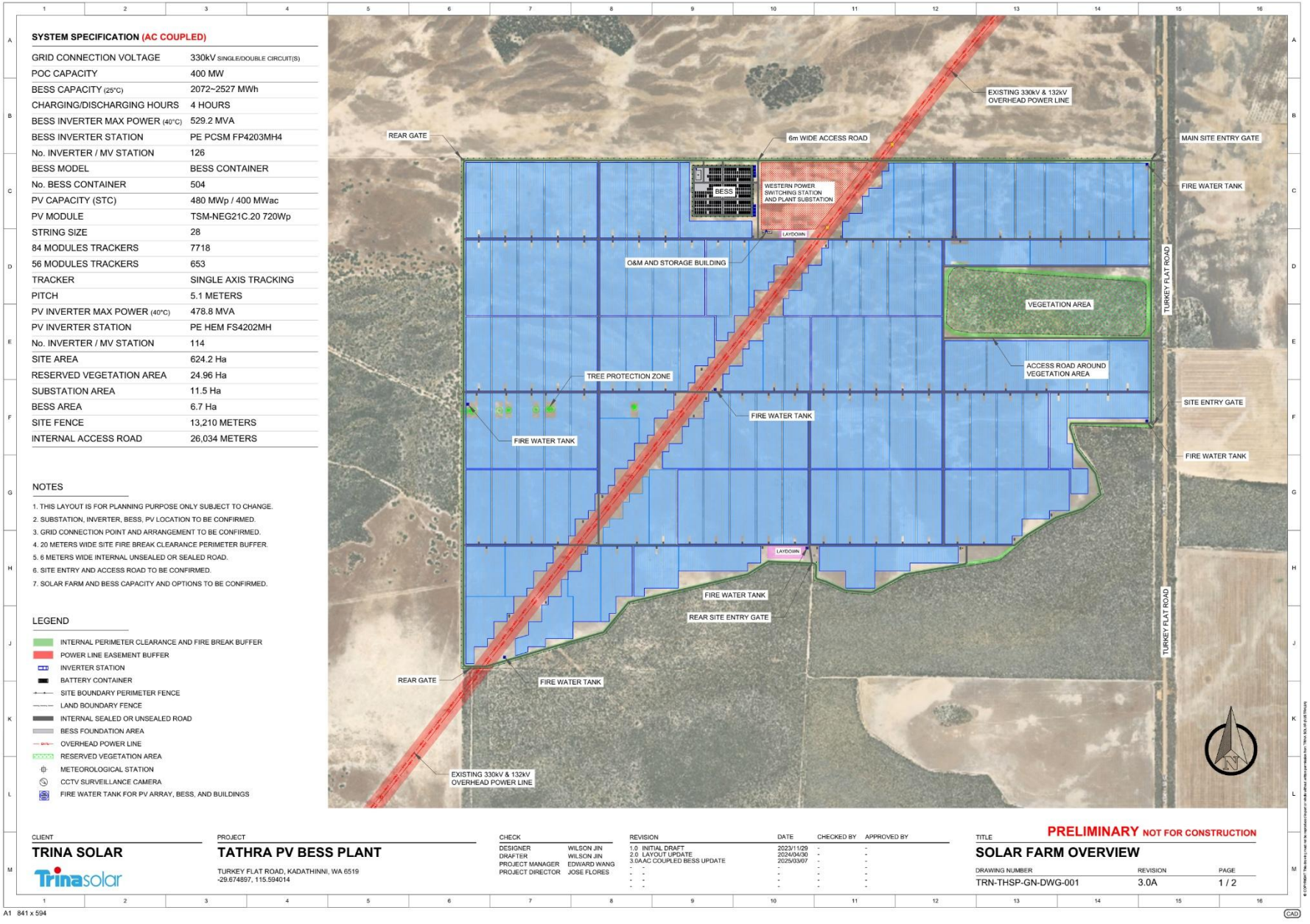
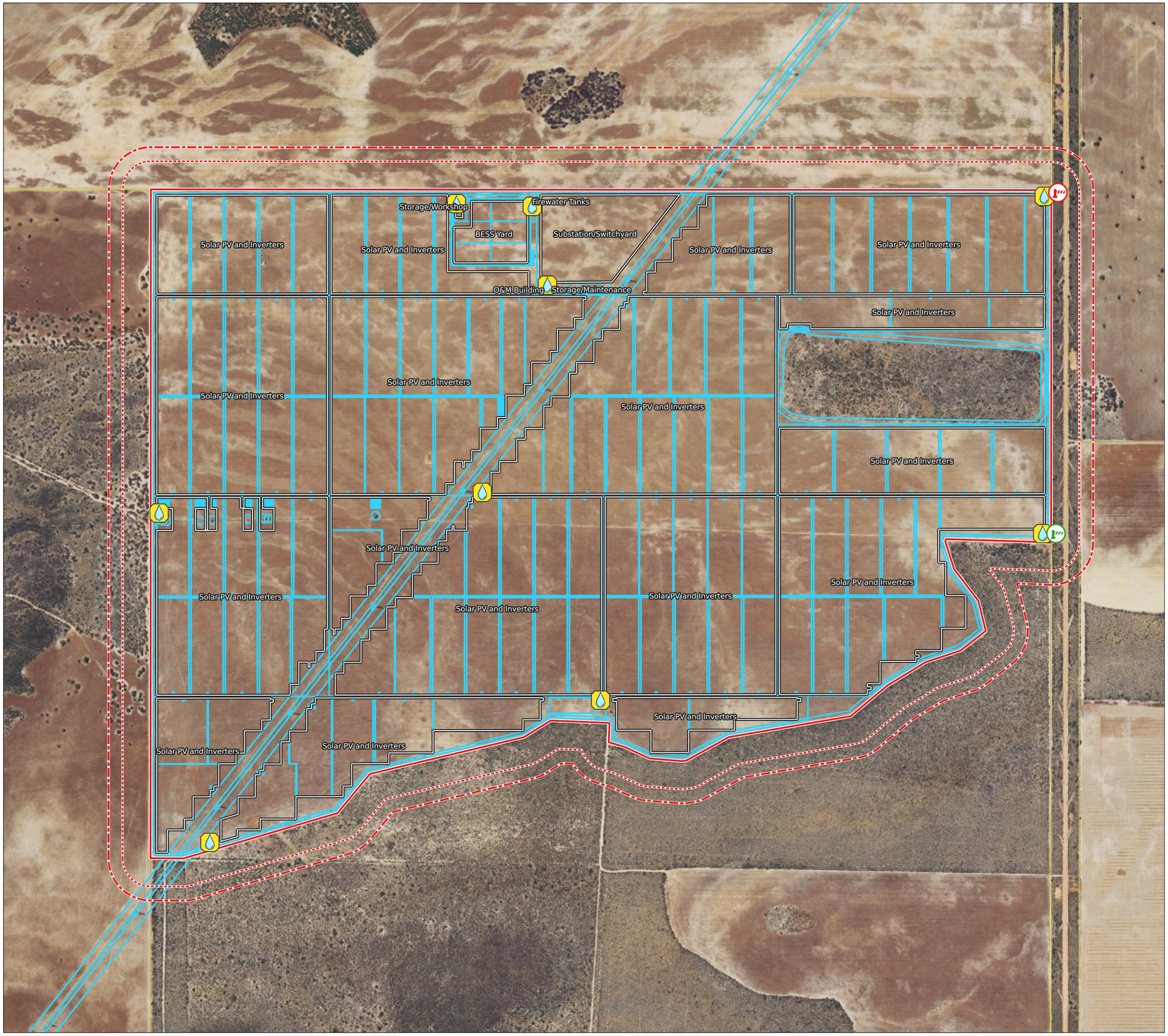


Figure 1: Development Plan



Legend

Mitigation Measures

- Main Site Entrance
- Alternative Site Entrance
- Firewater Tank
- Buildings/Infrastructure
- Project Area
- 100m
- 150m
- Cadastre

Scale 1:12,500

0 200 400 600 Metres

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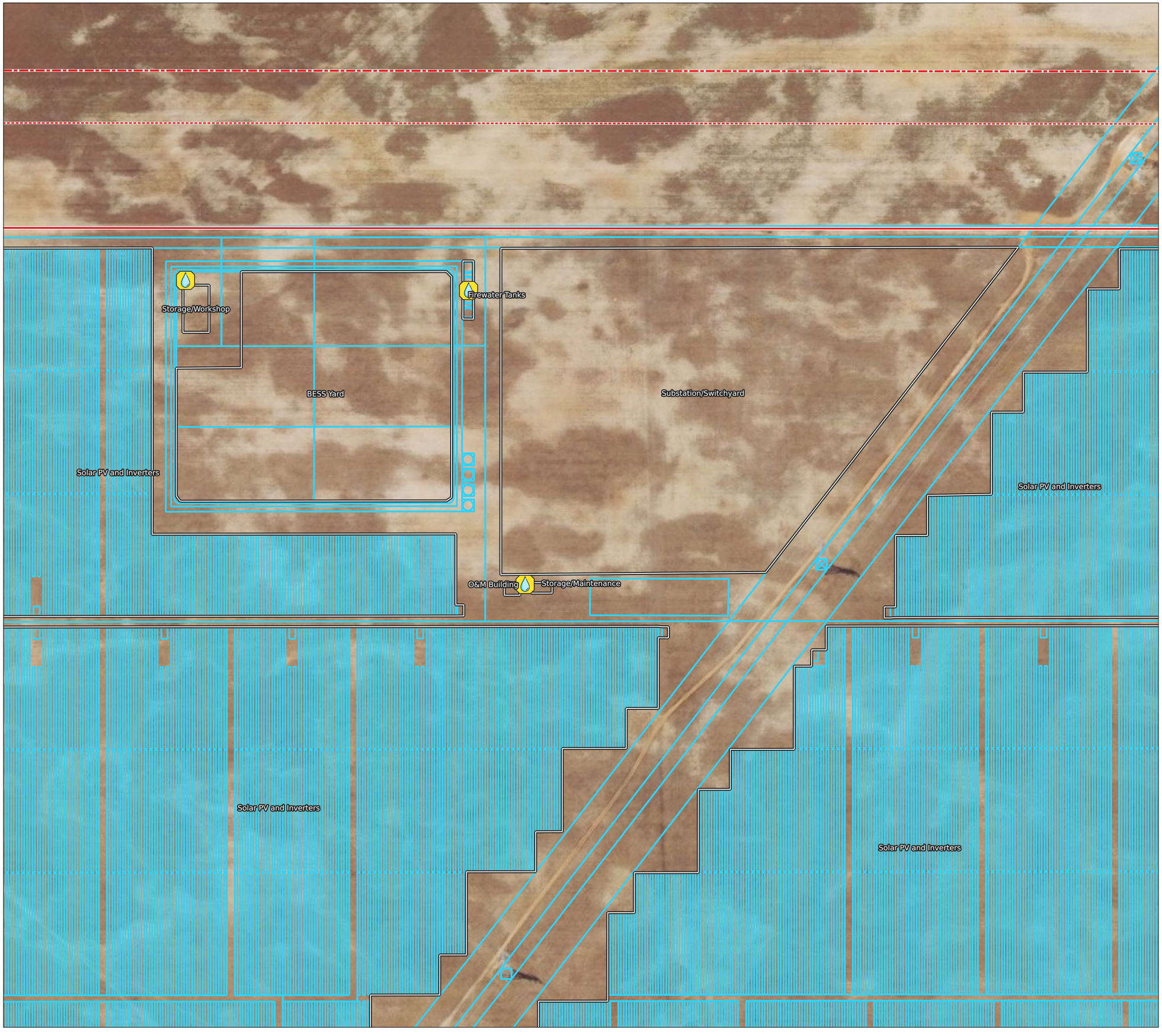
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Trina Solar

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Figure 2: Site Overview

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Legend

Mitigation Measures

- Firewater Tank
- Proposed Development
- Buildings/Infrastructure
- Project Area
- 100m
- 150m
- Cadastre

Scale 1:3,300

0 50 100 150 Metres

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Figure 3: Site Overview (Proposed Buildings, BESS and Substation)

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2.0 Environmental considerations

2.1 Native vegetation - modification and clearing

The development is proposed in grassland areas only, which is expected to be fully cleared as part of the proposal. The only clearing of non-grassland vegetation is to be within Turkey Flat Road verge, to establish the site entrances, especially the northern main entrance.

While not aware of any specific constraints to clearing, Linfire assumes that all relevant environmental and heritage studies will be conducted, and all required environmental approvals will be obtained, prior to commencing any on-site vegetation modification or clearing required to construct the development or implement the onsite Asset Protection Zones.

Should any constraints be identified as part of the environmental or heritage studies that would prevent vegetation clearing or modification, the design is to be tailored to ensure the implementation of compliant APZs can be achieved.

2.2 Revegetation / Landscape Plans

No revegetation is proposed as part of the proposal.

All vegetation modification and management is to be conducted in accordance with the requirements detailed in Section 5.1 of this BMP, including compliance with the APZ standards from the WA Guidelines (see Appendix 4) and requirements for low threat vegetation and managed gardens in accordance with AS 3959—2018 Clause 2.2.3.2 (f) (see Appendix 5).

3.0 Bushfire assessment results

The project area includes both proposed buildings and renewable energy infrastructure, however it is noted that it is only the proposed buildings that trigger assessment against SPP 3.7 and the WA Guidelines. Given the scope of this BMP is the proposed habitable buildings, the vegetation and BAL contour mapping could be taken from just the building extent, however given there is a measure from the project BRMP to site renewable energy infrastructure in various BAL ratings as well, the mapping has been undertaken for the entire site.

3.1 Assessment inputs

3.1.1 Vegetation classification

Linfire assessed classified vegetation and exclusions within 150 m of the project area through on-ground verification on 6 December 2024 in accordance with *AS 3959—2018 Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2018) and the *Visual Guide for Bushfire Risk Assessment in Western Australia* (DoP 2016).

Georeferenced site photos and a description of the vegetation classifications and exclusions based on expected post-development conditions are contained in Appendix 1, summarised on Table 1, and depicted on Figures 4 and 5, with additional zoomed in maps provided in

3.1.2 Effective slope

Linfire assessed effective slope under classified vegetation through on-ground verification on 6 December 2024 in accordance with AS 3959. Results were cross-referenced with Landgate 5 m contour data and are depicted in Table 1 and Figures 3, 4 and 5.

Site observations indicate that land is elevated to the north and north-east, and descends through the project area to the south and south-west, resulting in classified vegetation having an assessed effective slope of either flat/upslope or downslope 0° – 5°.

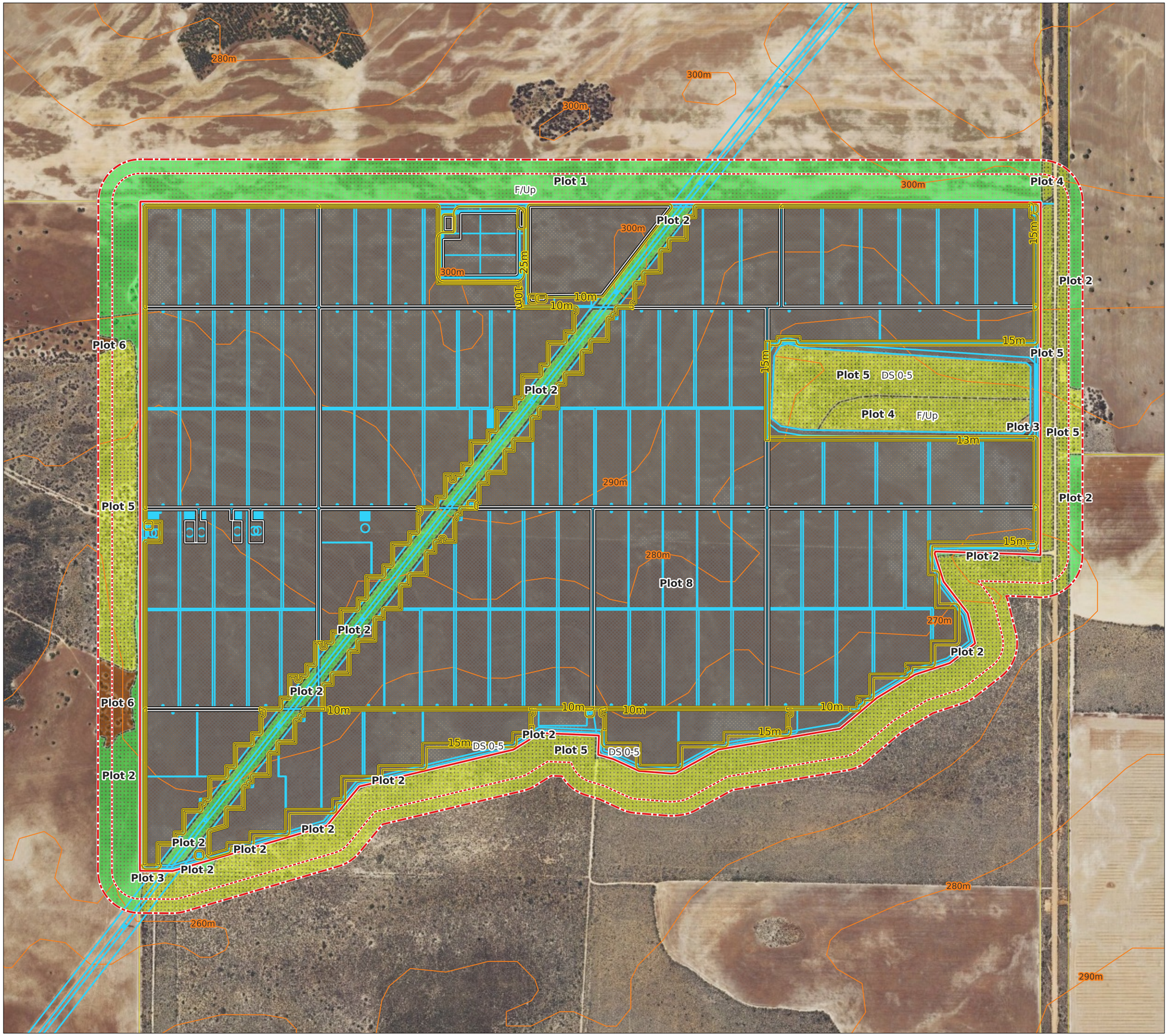
3.1.3 Summary of inputs

Table 1 illustrates the anticipated post-development vegetation classifications and exclusions for the project and assessment areas, following completion of development works and implementation of nominated Asset Protection Zones and low threat landscaping. The post-development vegetation classifications/exclusions and effective slope are summarised in Table 1.

Table 1: Post-development vegetation classifications/exclusions and effective slope

Vegetation plot	Vegetation classification	Effective slope	Comments
1	Class G Grassland	Flat/upslope (0°)	Unmanaged grassland that is currently, or could regrow, to more than 100 mm high. Includes unmanaged grassland within Western Power transmission corridor.
2	Class G Grassland	Downslope >0–5°	
3	Class C Shrubland	Flat/upslope (0°)	Vegetation less than 2 m high
4	Class D Scrub	Flat/upslope (0°)	Vegetation between 2 m and 6 m high. In places much of this vegetation is less than 2 m high and could be considered shrubland, however it has been conservatively assessed as scrub.
5	Class D Scrub	Downslope >0–5°	

Vegetation plot	Vegetation classification	Effective slope	Comments
6	Class B Woodland	Downslope >0–5°	Well spaced trees with grassy understorey.
7	Excluded – Non-vegetated (Clause 2.2.3.2 [e])	N/A	Existing non-vegetated land, on Turkey Flat Road.
8	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	Land to be modified to non-vegetated elements (roads, buildings, paths, infrastructure, cleared land etc) or managed low threat vegetation (managed landscaping, slashed grass etc)



Legend

- Contours
- Buildings/Infrastructure
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot
- Asset Protection Zone

Classified Vegetation

- B. Woodland
- C. Shrubland
- D. Scrub
- G. Grassland
- Excluded Clause 2.2.3.2(e)
- Modified to non vegetated and low threat

Scale 1:12,500

0 200 400 600 Metres

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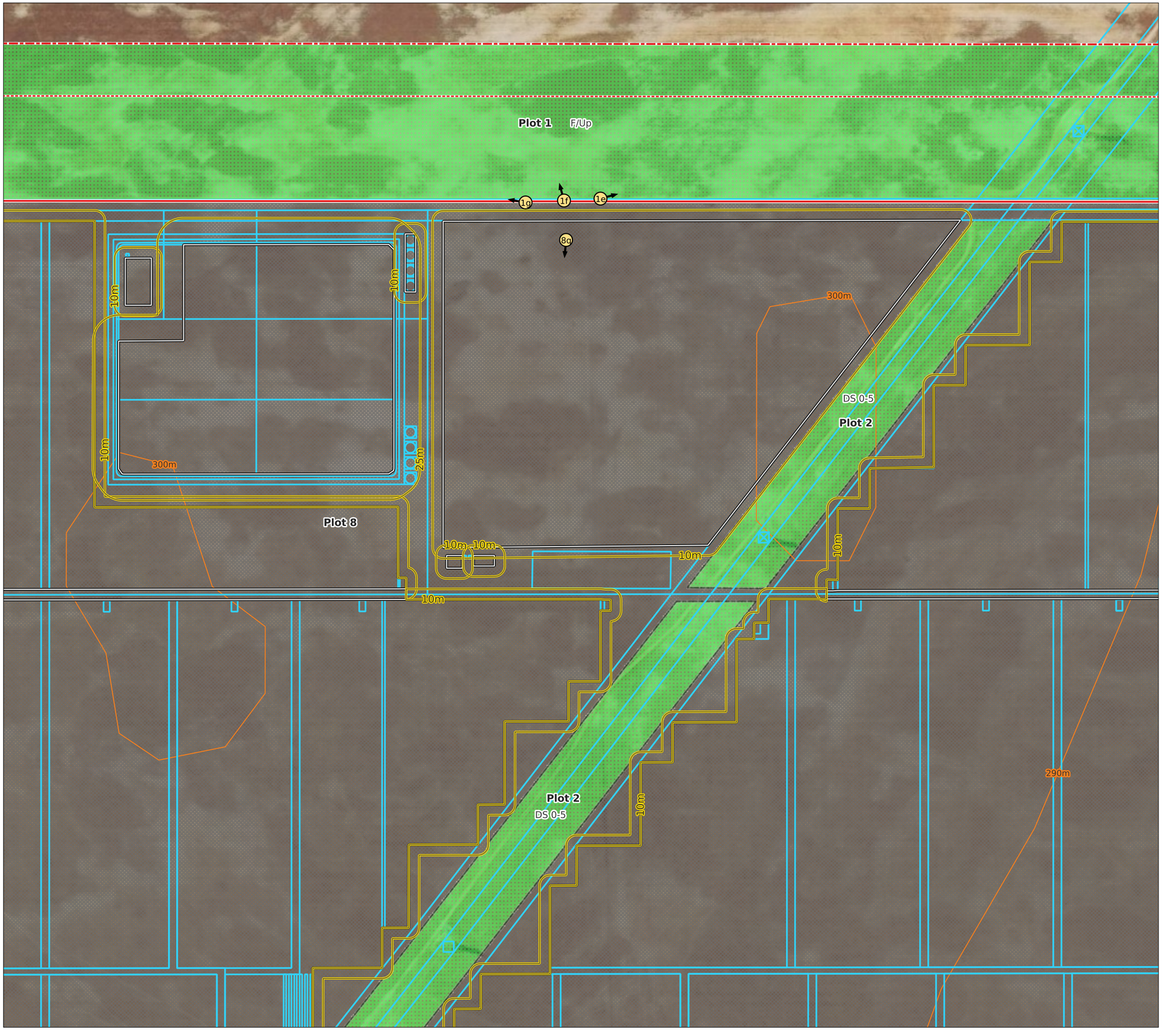
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Figure 4: Post-Development Vegetation and Effective Slope (Overall Facility)

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Legend

- Photo Location
- Contours
- Buildings/Infrastructure
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot
- Asset Protection Zone

Classified Vegetation

- G. Grassland
- Modified to non vegetated and low threat

Scale 1:3,300

0 50 100 150 Metres

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Figure 5: Post-Development Vegetation and Effective Slope (Proposed Buildings, BESS and Substation)

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3.2 Assessment outputs

3.2.1 Bushfire Attack Level (BAL) contour assessment

Linfire has undertaken a BAL contour assessment in accordance with Method 1 of AS 3959 for the project area (see Figures 6 to 9). The Method 1 procedure incorporates the following factors:

- state-adopted FDI 80 rating
- vegetation classification
- effective slope
- distance maintained between proposed development areas and the classified vegetation.

The BAL rating gives an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by proposed future development and subsequently informs the standard of building construction and/or setbacks required for proposed habitable development to potentially withstand such impacts.

The BAL contours are based on:

- the vegetation classifications and effective slope observed at the time of inspection
- the anticipated post-development vegetation based on proposed vegetation modification and management proposed to implement the development including bushfire management measures.

The results of the BAL contour assessment are detailed in Table 2, Table 3 and illustrated on Figures 6 and 7, which summarises the BAL impact on all the proposed buildings, with the highest BAL rating being **BAL–29** (within substation envelope) with all other buildings in **BAL-Low.**

Given the scope of the BMP is for the proposed buildings (O&M building, Storage/Maintenance building, Storage/Workshop building, substation buildings) only, the measurements on Table 2 are taken from classified vegetation to the buildings and the firewater tanks, with Table 3 summarising those for the renewable energy infrastructure (BESS, solar panel arrays, inverters, substation).

Table 2: BAL contour assessment results (to proposed buildings)

Method 1 BAL determination				
Plot	**Vegetation classification**	**Effective slope**	**Separation distance**	**Highest BAL**
1	Class G Grassland	Flat/upslope (0°)	>50 m	BAL–Low
2	Class G Grassland	Downslope >0–5°	10 m	BAL–29
3	Class C Shrubland	Flat/upslope (0°)	>100 m	BAL–Low
4	Class D Scrub	Flat/upslope (0°)	>100 m	BAL–Low
5	Class D Scrub	Downslope >0–5°	>100 m	BAL–Low
6	Class B Woodland	Downslope >0–5°	>100 m	BAL–Low
7	Excluded – Non-vegetated (Clause 2.2.3.2 [e])	N/A	N/A	N/A
8	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	N/A	N/A

Table 3: BAL contour assessment results (to all renewable energy infrastructure)

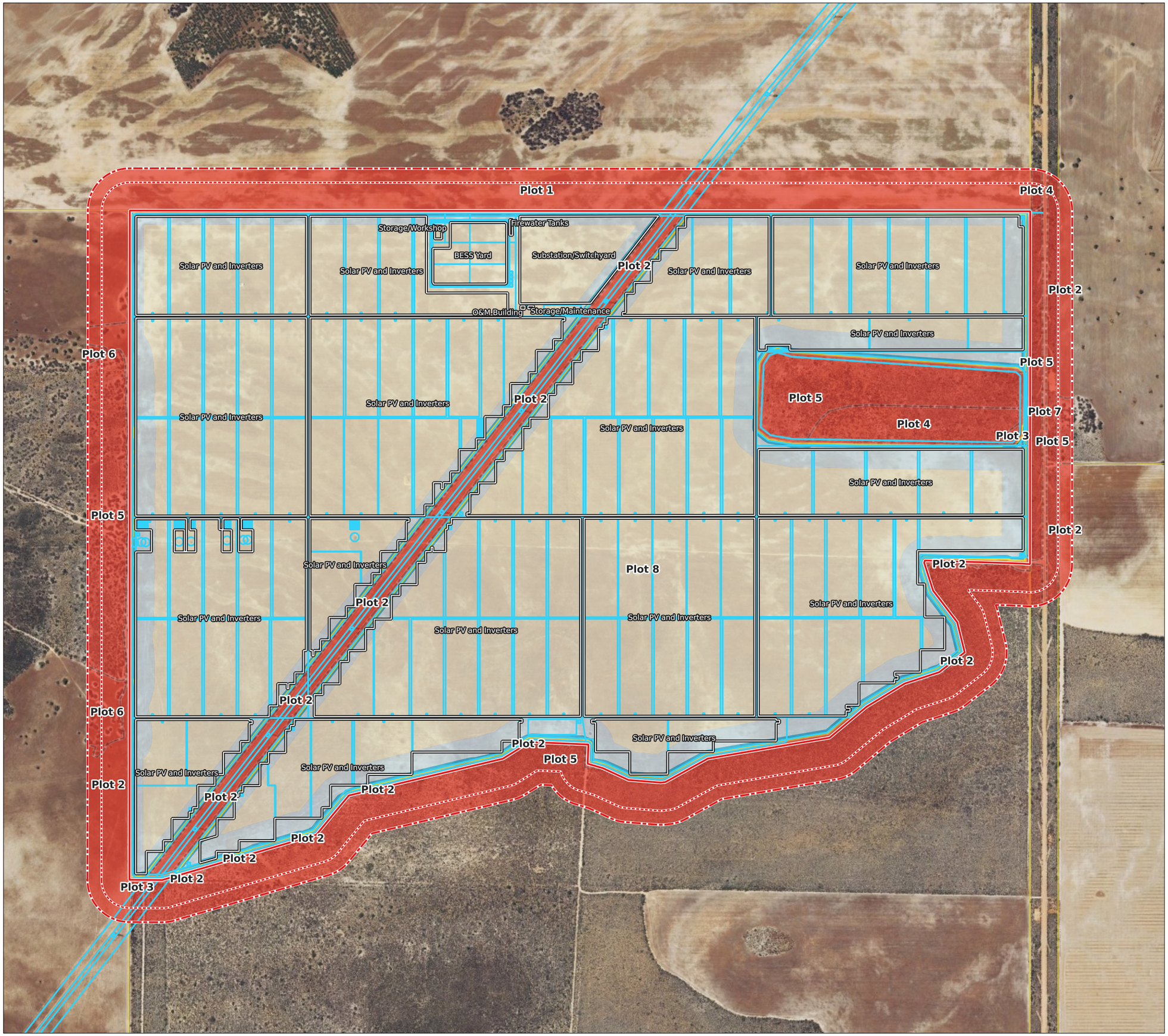
Method 1 BAL determination				
Plot	**Vegetation classification**	**Effective slope**	**Separation distance**	**Highest BAL**
1	Class G Grassland	Flat/upslope (0°)	10 m	BAL–29
2	Class G Grassland	Downslope >0–5°	10 m	BAL–29
3	Class C Shrubland	Flat/upslope (0°)	24 m	BAL–12.5
4	Class D Scrub	Flat/upslope (0°)	24 m	BAL–19
5	Class D Scrub	Downslope >0–5°	20 m	BAL–29
6	Class B Woodland	Downslope >0–5°	29 m	BAL–19
7	Excluded – Non-vegetated (Clause 2.2.3.2 [e])	N/A	N/A	N/A
8	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	N/A	N/A

Table 4 below lists the BAL applicable to each proposed building and the firewater tanks within the proposed development. In addition to the buildings, Table 4 also summarises the BAL impacts on proposed renewable energy infrastructure for discussion in the project BRMP.

Table 4: BAL applicable to each building/infrastructure element

Building / element	Initial BAL	APZ	Revised BAL
Proposed Buildings and Firewater Tanks			
O&M Building	BAL–FZ	• 10 m wide APZ around building perimeter	BAL–Low
Storage/Maintenance	BAL–FZ	• 10 m wide APZ around building perimeter	BAL–Low
Storage/Workshop (with BESS yard)	BAL–FZ	• 10 m wide APZ around building perimeter • BESS yard to be kept in non-vegetated state	BAL–12.5
Substation Envelope	BAL–FZ	• 10 m wide APZ around substation envelope perimeter • Substation and switchyard to be kept in to be kept in non-vegetated state	BAL-29 to BAL-Low
Firewater tanks	BAL–FZ	• 10 m wide APZ around perimeter of firewater tanks	BAL-29 to BAL-Low
Proposed Renewable Energy Infrastructure			
BESS	BAL–FZ	• 25 m wide APZ around perimeter of BESS cells	BAL–12.5
Solar PV arrays	BAL–FZ	• 10 m-15 m wide APZ around perimeter of solar PV arrays and inverter stations	BAL-29 to BAL-Low
Inverter stations	BAL–FZ	• 10 m-15 m wide APZ around perimeter of solar PV arrays and inverter stations	BAL-29 to BAL-Low
Substation Envelope	BAL–FZ	• 10 m wide APZ around substation envelope perimeter • Substation and switchyard to be kept in to be kept in non-vegetated state	BAL-29 to BAL-Low

Should there be any changes in development design or classified vegetation extent that results in a modified BAL outcome, then the BAL contours will need to be reassessed.



Legend

- Buildings/Infrastructure
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot

BAL Contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low

Scale 1:12,500

0 200 400 600 Metres

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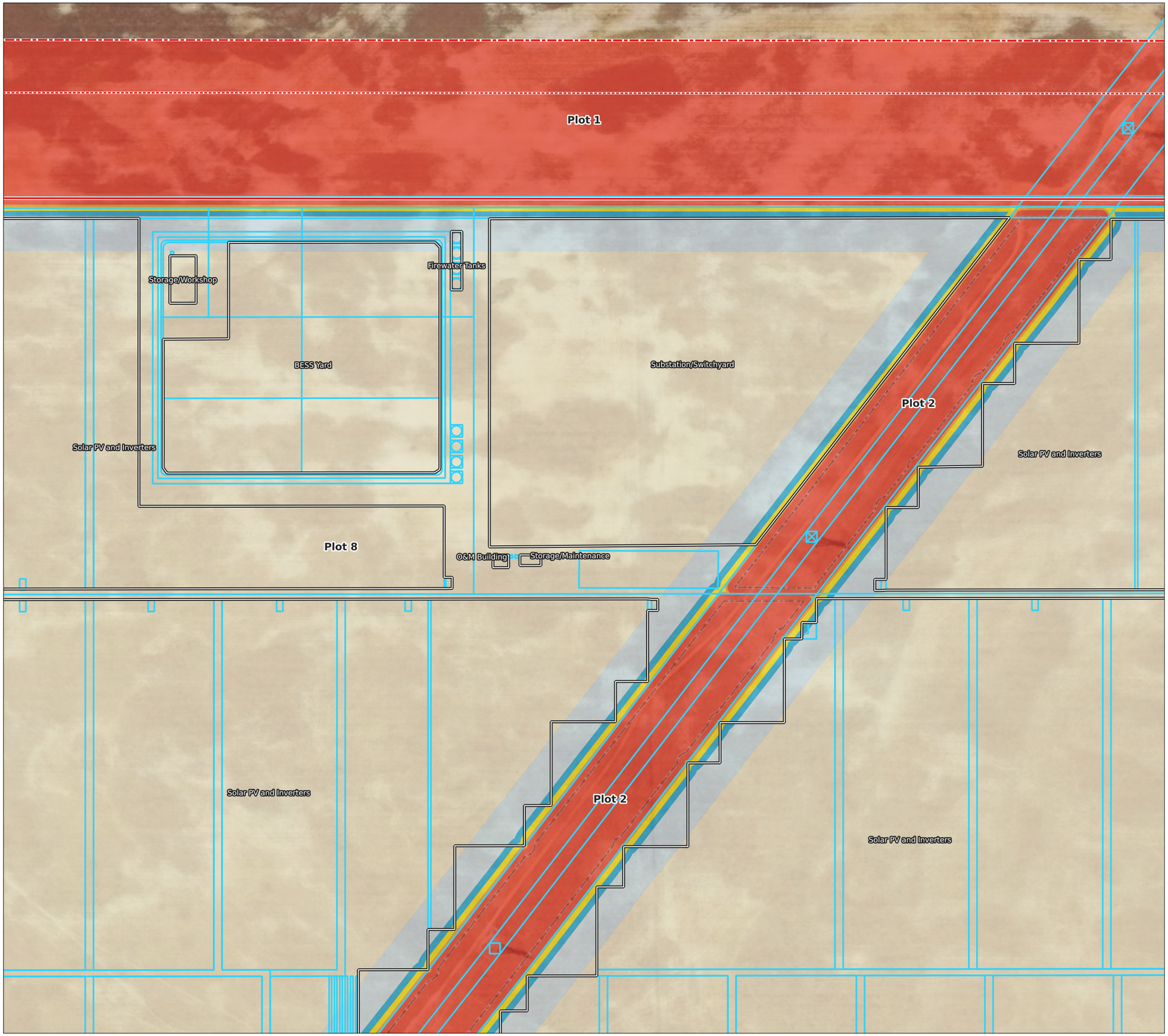
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Trina Solar

Tathra Solar and BESS Facility

Figure 6: BAL Contour Plan Overall Facility)

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Legend

- Buildings/Infrastructure
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot

BAL Contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low

Scale 1:3,300

0 50 100 150 Metres

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Figure 7: BAL Contour Plan (Proposed Buildings, BESS and Substation)

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4.0 Identification of bushfire hazard issues

4.1 Bushfire context

The project area is surrounded by unmanaged vegetation in all directions, with extended fire runs possible to the site primarily through unmanaged grassland vegetation, however significant plots of non-grassland vegetation does occur to the south and west.

Upon completion of development, the bushfire threat to the proposed buildings which are located on the northern part of the project area, will primarily be from the northern interface which is mostly unmanaged grassland with isolated plots of forest and scrub vegetation. There will also be some exposure from the retained scrub and shrubland vegetation within the site, to the south of the buildings. The buildings will be mostly shielded from direct bushfire impact from all other directions, by the proposed BESS and solar infrastructure, which will also have vegetation modification and management obligations under the project BRMP,

Given the above, the potential bushfire impact on the proposed buildings would be primarily from fully-developed grassland fire, with extended fire runs possible from the north, with few natural or man-made features that currently exist that would prevent bushfire behaviour reaching steady-state conditions. This would be expected to produce fires which would have elevated radiant heat flux however with a quick residence time (e.g. 10-15 seconds of peak radiant heat flux), and with limited ember attack. Fire within the scrub and shrubland vegetation to the south could also produce steady-state bushfire conditions, which would be expected to have elevated radiant heat flux, a slightly longer residence time and some associated ember attack.

Notwithstanding, any fire approaching the development, would represent a threat to the proposed buildings and occupants, if not appropriately managed. It is acknowledged that the bushfire risk to the proposed development posed by these hazards can be managed through standard application of Acceptable Solutions under the Guidelines, as well as through a direct bushfire suppression response if required.

Further review of the bushfire hazard to the renewable infrastructure is detailed in the BRMP (Linfire, 2025) that accompanies this BMP.

4.2 Bushfire hazard issues

Examination of the environmental considerations (Section 2.0) and the bushfire risk assessment (Section 3.0) has identified the following bushfire hazard issues:

1. Based on the existing extent of vegetation outside proposed infrastructure and roads, the proposed development is subject to an initial BAL of BAL-FZ. Vegetation modification and management will be required to ensure sufficient separation between proposed buildings/infrastructure and unmanaged vegetation, to limit the impact of bushfires on the development and prevent ignition and spread of a fire from proposed infrastructure. Given the potential hazards associated with onsite Dangerous Goods (e.g. BESS), particular attention will need to be provided to areas where these are manufactured or stored.
2. Ensuring sufficient internal vehicular access to the proposed development, to enable egress by onsite staff, but as importantly, provide sufficient access to the infrastructure to enable attending bushfire fighting appliances to control or suppress any fires.
3. Ensuring a compliant bushfire fighting water supply for fire brigade is provided to protect the proposed building will be crucial.
4. The proposed development contains renewable energy infrastructure (including BESS), a separate BRMP has been prepared to demonstrate compliance with the CFA Guidelines (refer to Linfire, 2025).

4.3 Bushfire safety strategy

The following bushfire safety strategy is proposed to demonstrate compliance with the Bushfire Protection Criteria of the Guidelines and address the bushfire hazards identified above:

1. Create sufficient separation between buildings and infrastructure from surrounding classified vegetation by establishing suitably sized APZs to achieve a compliant rating of BAL-29 or less, and to reduce the bushfire impact on proposed hazardous materials to minor levels as required, to improve the effectiveness of the other mitigation measures incorporated into the facility.
2. Provide compliant vehicular access to the proposed buildings, from the surrounding public road network, to enable occupant egress and to facilitate firefighter access.
3. Provide a secure bushfire fighting water supply, to enable refill of bushfire fighting appliances.
4. Incorporate the bushfire risk management measures for the proposed renewables infrastructure detailed in the project BRMP, including appropriate bushfire emergency management procedures, into this BMP.

Based on the above, Linfire considers the bushfire hazards within and adjacent to project area and the associated bushfire risks are manageable through standard management responses outlined in the WA Guidelines. These responses will be factored into proposed development as early as possible at all stages of the planning process to ensure a suitable, compliant and effective bushfire management outcome is achieved for protection of future life, property and environmental assets.

5.0 Bushfire management measures

The following bushfire management measures, informed by the compliance assessment in this BMP and the project BRMP for renewable energy infrastructure (Linfire, 2025), and are required to be implemented as part of the development and increase the level of bushfire risk mitigation across the site.

Where possible, the bushfire management measures for both the buildings (from BMP) and renewable energy infrastructure (from BRMP) have been depicted on Figures 8 to 12 in this BMP.

5.1 Vegetation modification and management

The BAL contour plan assumes that the proposed development area (Plot 8), being cleared of grassland and maintained as non-vegetated land or low threat vegetation by the Proponent, for the life of the project.

In order to manage the bushfire risk to the development, additional guidance is provided to ensure sufficient separation is to be provided between proposed buildings and infrastructure, and unmanaged vegetation, including the following requirements:

- Non-Vegetated Zone (NVZ) and Asset Protection Zone (APZs) around the perimeter of the following:
  - O&M building
  - Storage/Maintenance building
  - Storage/Workshop building (near BESS yard)
  - Substation buildings
  - Firewater tank/s
- NVZ/APZ around the perimeter of all renewable energy infrastructure including
  - BESS cells (BESS yard)
  - Solar PV arrays and Inverter Stations
  - Substation and switchyard envelope.
- Non-vegetated land within perimeter NVZ/APZ of the following:
  - BESS cells (BESS yard)
  - Substation and switchyard envelope
- Non-vegetated land or managed vegetation within solar PV arrays and around inverter station (i.e. within perimeter NVZ/APZ around solar PV arrays)

Where stipulated, the NVZ/APZ must be non-vegetated, however outside this they can be either non-vegetated or managed low threat landscaping established in accordance with the APZ standards from the WA Guidelines (see Appendix 4) and AS 3959 Clause 2.2.3.2 (e) and (f) (see Appendix 5), however would preferably be non-vegetated where possible.

All onsite vegetation modification and management (including NVZ/APZ) is to be conducted and maintained by the Proponent for the life of the facility. It is noted that there is minor NVZ/APZ incursion into the Western Power transmission corridor (in addition to internal road crossings), and while these areas are currently grazed land devoid of vegetation, it is assumed that the Proponent will secure the necessary permissions from Western Power to implemented to clear and maintain vegetation their land.

Further information on vegetation management is provided in the sections below.

5.1.1 Non-Vegetated Zone/Asset Protection Zone– Buildings and Associated Firewater Tank/s

In order to ensure sufficient separation is maintained between proposed buildings and firewater

tank/s, and surrounding unmanaged vegetation, the following NVZ/APZs will be required:

- 10 m wide NVZ/APZ around the perimeter of the following to achieve BAL-29 or lower on any buildings:
  - O&M building
  - Storage/Maintenance building
  - Storage/Workshop building (near BESS yard)
  - Substation/Switchyard envelope
- 10 m wide NVZ/APZ around any firewater tanks associated with the above buildings, to achieve BAL-29 or lower, and provide separation from any renewable energy infrastructure.
  - No renewable energy infrastructure is permitted in the 10 m NVZ/APZ around any firewater tanks

5.1.2 Non-Vegetated Zone/Asset Protection Zones – Renewable Energy Infrastructure

Sufficient separation is to be maintained between proposed renewable energy infrastructure, and surrounding unmanaged vegetation, to protect infrastructure from approaching bushfire impact, while also reducing the potential for onsite infrastructure fires to ignite a bushfire.

5.1.2.1 BESS System and Associated Firewater Tanks

The following NVZ/APZs will be required for the BESS system:

- The BESS units are to have a 25 m wide perimeter NVZ/APZ to achieve BAL-12.5 or lower, consisting of the following:
  - A 10 m wide NVZ adjacent to the BESS units, that is non-combustible (constructed of concrete, mineral earth or non-combustible mulch etc) and free of vegetation and obstructions at all times, with no plant or equipment unless totally non-combustible.
  - Outside the 10 m NVZ, the remaining 15 m can be non-vegetated or otherwise comply with the APZ standards from the WA Guidelines, with the following clarifications:
    - Have no trees located close enough to BESS's such that any falling branches or trees could mechanically damage the BESS
    - Largely consist of managed grassland (<100 mm in height) or low groundcovers
- All land within the BESS perimeter NVZ/APZ (i.e. within BESS yard), are to be non-combustible (constructed of concrete, mineral earth or non-combustible mulch etc) and free of vegetation and obstructions at all times, with no plant or equipment unless totally non-combustible.
- 10 m wide NVZ/APZ around any firewater tanks associated with the above BESS system, to achieve BAL-29 or lower, and provide separation from any renewable energy infrastructure.
  - No renewable energy infrastructure is permitted in the 10 m NVZ/APZ around any firewater tanks

5.1.2.2 Substation/Switchyard

The following NVZ/APZs will be required for the substation/switchyard:

- The substation is to have an 10 m wide perimeter NVZ/APZ to achieve no less than BAL-29.
  - In order to limit the chance of electrical faults in the substation from igniting a bushfire, all within the substation NVZ/APZ consisting entirely of non-vegetated

elements.

- All land within the substation/switchyard perimeter APZ (i.e. with substation/switchyard envelope) is to be non-combustible (constructed of concrete, mineral earth or non-combustible mulch etc) and free of vegetation and obstructions at all times, with no plant or equipment unless totally non-combustible.

5.1.2.3 Solar PV Array and Inverter Stations

In order to ensure sufficient separation is maintained between proposed solar PV and Inverter Stations, and unmanaged vegetation, the following APZs will be required:

- A 10 m – 15 m wide NVZ/APZ, is to be established around the perimeter of the solar panel arrays and Inverter Station envelopes, to achieve BAL-29 or lower on this infrastructure.
    - Ideally the perimeter NVZ/APZs around solar panel arrays and inverters should be non-combustible (constructed of concrete, mineral earth or non-combustible mulch) and free of vegetation as much as practical, or otherwise compliant with the APZ standards, with no plant or equipment unless non-combustible.
- 10 m wide NVZ/APZ around any firewater tanks associated with the above solar PV system, to achieve BAL-29 or lower, and provide separation from any renewable energy infrastructure.
    - No renewable energy infrastructure is permitted in the 10 m NVZ/APZ around any firewater tanks

Within the perimeter solar panel APZs, all vegetation beneath the solar panels and around inverter station (Plot 8) is to be managed to limit the potential for ignition and spread of fire from an electrical fault, or damage to panels from an external bushfire.

- Ideally this would be kept in a non-vegetated state, however management of grass to less than 100 mm in height as per the APZ standards during bushfire season is also sufficient.

5.2 Vehicular access

Vehicular access requirement to the proposed facility from Turkey Flat Road, as well as within the development, is broadly divided into requirements for access to the buildings as per WA Guidelines, and access to the renewable energy infrastructure as per CFA Guidelines.

While these requirements are detailed in separate sections below, to avoid confusion, the vehicular access specifications will largely comply with WA Guidelines, with additional guidance provided from CFA Guidelines where required.

The internal roads, site entrances, gates and signage are to be constructed and maintained by the Proponent in perpetuity (or for the life of the facility).

5.2.1 Vehicular access – Buildings and Firewater Tank/s

The internal road accessing the future buildings and associated firewater tank/s, is to comply with the requirements of A3.1, including the following:

- Comply with the requirements in Appendix B.3 Table 10, Column 5 (see Appendix 6)
    - While the preference is that internal roads are at least 6 m wide, where >4 m wide but <6m wide, passing bays are to be provided every 200 m that are 6m wide x 20m long.
- Provide compliant turnarounds (see Appendix 6) or loop roads within 30 m of each permanent building.
- Provide vehicular access to the firewater tanks (or tank suction connection) required for

the buildings in accordance with A4.1, to enable attending fire appliances to refill, including a hardstand adjacent to tank suction connection and sufficient provision for fire appliance turnaround.

- Any vehicular access gates, including those at site entrances, are to have clear opening of no less than 6 m.
    - If any site entrances or gates within the facility are to be locked to restrict access, keys are to be provided to DFES/local fire brigades prior to operation.

5.2.2 Vehicular Access – Renewable Energy Infrastructure and Firewater Tank/s

The internal road network accessing the renewable energy infrastructure is to comply with the private driveway specifications of WA Guidelines as detailed in Section 5.2.2, with the following additional guidance provided from the CFA Guidelines:

- At least 2 site entrances are to be provided to the facility from Turkey Road into the development.
- All gates are to comply with the requirements detailed in Section 5.2.1.
- Emergency Information Book and Signage (see Section 5.6) is to be provided at the nominated site entrance for attending emergency services personnel.
- Provide vehicular access to the firewater tanks (or tank suction connection) required for the renewable energy infrastructure, to enable attending fire appliances to refill, including a hardstand adjacent to tank suction connection and sufficient provision for fire appliance turnaround.

5.2.2.1 Vehicular Access - BESS Units

In addition to the requirements of Section 5.2.2, the following are also to be provided for the BESS units:

- At least 2 entrance/exit gates are to be provided to the BESS yard, and the internal road to be configured as loop road, to avoid creation of any internal dead-end roads.
- Provide a perimeter road around the BESS cells, and provide access in between the BESS cells,
- The perimeter road around the BESS units, and within the BESS cells are to be 6 m minimum width, and otherwise compliant with private driveway standards of the WA Guidelines.

5.2.2.2 Vehicular Access – Solar PV Arrays

In addition to the requirements of Section 5.2.2, the following are also to be provided for the Solar PV arrays:

- Internal road access is to be provided as perimeter loop roads around each solar PV array.
- Design to ensure at least two (2) but preferably more access points to each solar PV array (i.e. not single points of access)
- All internal roads are to comply with private driveway specifications of WA Guidelines noting the following:
    - The solar PV roads are to be at least 4 m wide, but if <6m wide, passing bays are to be provided every 600 m that are 6m wide x 20m long.

5.2.3 Staging of access

If development (and therefore construction of vehicular access) is to occur on a staged basis, vehicular access arrangements will need to ensure that all occupants are provided with compliant access at all stages.

5.3 Firewater supply

Given there is no reticulated water supply to the site, the onsite firewater will be as follows:

- Provided for proposed buildings in accordance with WA Guidelines, in static firewater tank/s
- Provided for renewable energy infrastructure in accordance with the CFA Guidelines, as a fire hydrant system for the BESS and additional static firewater tank/s for the solar PV arrays.

Where appropriate, the requirements of the CFA Guidelines have been substituted with those of the WA Guidelines for ease of local application. All static firewater tanks are to comply with the relevant technical requirements from the WA Guidelines (see Appendix F) and the requirements from the CFA Guidelines including:

- Must be an above-ground water tank constructed of concrete or steel and must comply with AS 2419.1 and signage indicating 'FIRE WATER' (or similar approved) and the tank capacity must be fixed to each tank.
- The static water storage tanks must be located at vehicle access points to the facility and must be positioned at least 10 m from any infrastructure (e.g. BESS units etc.).
- The hard-suction point must be positioned within 4 m to a hardstand area or internal road, and protected from mechanical damage where necessary, and provide a clear access for emergency services personnel.

Additionally, all firewater tanks are to include the following:

- All firewater tanks are to be sited further than 10 m from infrastructure and buildings, as well as in an area of BAL-29 or lower
    - To ensure this is implemented, a 10 m wide NVZ/APZ around the perimeter of the tank/s
    - No infrastructure or buildings are permitted in the 10 m NVZ/APZ, and all land between the tank/s and nearby infrastructure, or buildings is to be non-vegetated.
- Vehicular access to the firewater tank/s is to be via proposed internal roads.
    - Vehicular access is to be provided to within 4 m of the tank suction point.

The Emergency Information Book and Signage to be provided at the site entrance for attending emergency services personnel (see Section 5.6) is to include the location of all onsite fire hydrant system, firewater tanks and the internal access routes to these tanks.

All firewater tanks are to be constructed, filled and maintained for the life of the project by the Proponent.

5.3.1 Firewater – Buildings

Bushfire fighting water supply for proposed buildings, is to be from static firewater tank/s as follows:

- The tank is to have no less than 10 kL per building (including those within the substation envelope, if any).
- This firewater requirements for the proposed buildings, can either be stored in a separate firewater tank, or combined with (i.e. added to) the firewater tank/s required for the renewable energy infrastructure, if located near the buildings (see Section 5.3.2).

The firewater tank is to comply with the specifications detailed in Section 5.3, including provision of NVZ/APZ to ensure it is an area of BAL-29 or lower and further than 10 m from any renewable energy infrastructure.

5.3.2 Firewater – Renewable Energy Infrastructure

5.3.2.1 Firewater - BESS Units

- Firefighting water supply for proposed BESS units is to comply with the requirements of CFA Guidelines for BESS facilities in areas without reticulated water supply as follows (unless agreed otherwise with DFES as detailed below):
    - The firewater supply must be of a quantity no less than 288,000L or as per the provisions for Open Yard Protection of AS 2419.1-2021, flowing for a period of no less than four hours at 20L/s, whichever is the greater.
    - The quantity of static firewater storage is to be calculated from the number of hydrants required to flow from AS 2419.1-2021: Fire hydrant installations, Table 2.2.5(D).
    - Fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet.
    - The firewater supply must be located at vehicle entrances to the facility, at least 10m from any renewable energy infrastructure and buildings.
    - The firewater supply must be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency. (e.g. Fire water tanks are to be located closer to the site entrance that the battery energy storage system).
    - The firewater supply must comply with relevant Australian Standards (including AS 2419.1)
- Given the substantial amount of firewater required, no additional capacity is proposed for bushfire fighting purposes (other than the 10 kL per building required to comply with the WA Guidelines as detailed in Section 5.3.1).
- ***While compliance with the CFA Guidelines is stated as a requirement of this BMP as detailed below, it is also noted that the CFA Guidelines may lag current BESS firefighting practice requiring less use of firewater, and on this basis, should DFES and the Proponent review the firewater system requirements and agree to a rationalised system or firewater capacity in line with current BESS firefighting responses, then this BMP would view this as an acceptable deviation from the CFA Guidelines.***

5.3.2.2 Firewater - Solar PV Arrays

- Firefighting water supply for proposed solar PV arrays is to comply with the requirements of CFA Guidelines for solar facilities as follows:
    - Provision 45 kL firewater tank at the main entrance to the facility
    - Provision of additional 45 kL fire water tanks for every additional 100 ha of solar PV panels (after the initial 100 ha).
- All firewater tanks are to be sited further than 10 m from infrastructure and buildings, as well as in an area of BAL-29 or lower
    - To ensure this is implemented, a 10 m wide NVZ/APZ around the perimeter of the tank/s
    - No infrastructure or buildings are permitted in the 10 m NVZ/APZ, and all land between the tank/s and nearby infrastructure, or buildings is to be non-vegetated.
- Vehicular access to the firewater tank/s is to be via proposed internal roads.
    - Access is to be provided to within 4 m of the tank suction point.

5.3.3 Provision of mobile fire trailer

A mobile fire trailer (or similar approved) is required to enable the onsite staff to:

- have on standby during any approved tasks that may ignite a bushfire (e.g. hot-works etc), or
- provide a rapid first response to any small onsite ignition events while the fire is in the incipient stage to prevent growth and spread of the fire

This firefighting infrastructure is not to be used by staff to fight developed bushfire i.e. staff not expected to fight bushfires.

As a minimum, the fire trailer (or similar approved) should have:

- No less than 1000 L tank
- Fire pump and hose reel
- Mounted on trailer or ute to enable easy transport around the site.
    - If on trailer, sufficient vehicles shall be onsite with capability to mount the trailer (e.g. equipped with appropriate tow balls).

The Proponent is to supply the fire trailer (or similar approved) prior to commissioning, and ensure it is maintained and ready for use at all times during bushfire season, including ensuring a full water tank and pump fuel tank.

5.4 Renewable Energy Infrastructure Design, Construction, Installation & Commissioning

The following measures are required for the proposed renewable energy infrastructure to manage the risk of fires, with more specific guidance provided in subsections below:

- All electrical equipment, including electrical cabling, junction boxes, inverters and transformers, must comply with relevant design, construction and installation standards of electrical equipment including relevant Australian Standards, and manufacturers recommendations.

5.4.1 BESS System

Ensure the following elements are included in the BESS:

- External container is to be non-combustible material (e.g. metal).
- Use suitable Li-ion batteries (or appropriate alternative), with sufficient cell quality and barriers, to limit potential for thermal runaway generating from internal cell defects and cascading thermal runaway.
- Battery management/monitoring systems for monitoring and managing the state of battery systems including shutdown if any of the voltage, current, or temperature changes are out of limit.
- Systems to prevent heat/fire spread within battery containers (such as thermal barriers, shut-down separators, isolation systems, cooling systems).
- Detection systems for smoke, heat (thermal), fire and toxic gas (off-gassing) within battery containers.
- Appropriate suppression systems for fire within battery containers.
- Systems to prevent explosion within battery containers by safely ventilating the system in a controlled manner to reduce the flammability of the atmosphere, such as ventilation, pressure relief and exhaust systems, including incorporation of adequate explosion prevention protection, where applicable.
- Warning and alarm systems within the battery containers, and/or the facility, to enable early warning for faults, operation of the battery energy storage system above

'normal'/safe parameters, smoke, off-gassing, and fire.

- Consideration of direct alarm monitoring to the fire brigade for BESS automatic detection systems (in liaison with DFES)
- Provide suitable ember protection (e.g. BAL-12.5 construction) to prevent embers from penetrating battery containers/enclosures including, but not limited to:
    - Battery enclosures via any external walls/roofs (if not completely sealed) and gas ventilation inlets/outlets.
    - Thermal management system (chiller) inlets and outlets
    - Any unsealed penetrations are to be appropriately sealed (with non-combustible material) or gaps/openings (>2mm) are to be screened with non-combustible (aluminium, steel, bronze) screening with maximum aperture <2mm.
- BESS installation is on a non-combustible surface (e.g. concrete)
- Where relevant and appropriate to the type of BESS installed, consider adopting:
    - Current versions of UL 9540 or FM Global Property Loss Prevention Data Sheet 5-33, for the design and operation of BESS's.
- Separation between the BESS's and any other electrical infrastructure, must be at least the distance where the radiant heat flux from a fully involved in fire in the infrastructure, does not create the potential for ignition of these site elements (adjacent battery containers/enclosures, on-site buildings, substations).
    - This is outside the bushfire scope, and is expected to be addressed by complying with relevant codes and standards, including Australian Standards, and any manufacturers recommendations.

5.4.2 Solar PV System

- Ensure the following elements are included in the solar panel array design and layout:
    - Solar energy facilities are to have a minimum six (6) metre separation, as follows, and has compliant vehicular access:
        - between solar panel banks (i.e. a bank of solar panels connected to a single power conversion unit/inverter), or
        - so that no unbroken area of solar panels is greater than 25ha.
    - The panel mounting posts will also be on-combustible (likely steel), so will not contribute to the fuel load or support fire
    - Cabling is either designed to be below-ground or installed as high as practical above-ground.
- Ensure inverters are designed to minimise fire risk and is provided with required separation from adjacent infrastructure and the combustible vegetation, in accordance with relevant Australian Standards and manufacturers recommendations.

5.4.3 Substation

- Substation infrastructure is to be designed, constructed and maintained to relevant Australian Standards and Western Power specifications.
- Ensure transformer is designed to minimise fire risk, incorporates either oil bund or flame trap (if required), and is provided with required separation from adjacent infrastructure and the combustible vegetation, in accordance with relevant Australian Standards, Western Power and manufacturer specifications.

5.4.4 Facility Monitoring

- Appropriate system monitoring for all renewable energy infrastructure must be provided, especially the BESS BMS and fire/gas detection, to ensure that any electrical or

equipment failures with the potential to ignite or propagate fire are rapidly identified and relevant site personnel notified to enable early fire brigade notification.

- Monitoring is to be configured to provide warning to relevant onsite and offsite personnel.

5.4.5 Additional Design, Construction and Commissioning Requirements

The proposed facility will need to incorporate these design, commissioning and construction requirements to manage the risk of onsite fire and bushfire from the development:

- Ensure an emergency communication system must be provided that is reliable and will operate in the event of power failure
- Ensure all electrical equipment (e.g. electrical cabling, junction boxes, inverters and transformers) must comply with relevant design, construction and installation standards of electrical equipment including relevant Australian Standards, and manufacturers recommendations.
- Install and commission fire detection, alarm and suppression systems at the earliest possible stage of construction.
- Provide first response firefighting equipment (e.g. extinguishers) at all construction portables/buildings onsite, in the vicinity of all construction activities, and in site-based vehicles.
- Provide mobile fire trailer (or similar approved) prior to commissioning of the renewable energy infrastructure.
- Ensure sufficient training provided to relevant personnel on the use of on-site firefighting equipment and first-aid, and responsibilities during emergencies
- Provide required fire protection equipment for Dangerous Goods as per relevant Australian Standards.
- Ensure tight ignition source control, including hot works and restriction of smoking to prescribed areas.
- Conduct any required vegetation management.
- Undertake all required infrastructure, equipment and vehicle maintenance.
- Incorporate emergency management procedures into the Construction Management Plan (or other relevant document) for the construction and commissioning phase, adopting similar concepts to those in Section 5.8 for the operational facility, which includes:
  - Adhere to restrictions and guidance during days of Fire Danger Rating of High to Catastrophic, and Total Fire Ban days and Harvest Movement Ban days
  - Regularly monitor for, and otherwise be aware of, bushfires in the local area, and evacuate offsite prior to bushfire impact onsite.
  - Emergency procedures for identified risks and hazards of the renewable energy infrastructure, including but not limited to
    - Bushfires
    - Onsite fire in renewable energy infrastructure (e.g. electrical infrastructure faults and fire in BESS or substation)
  - Ensure the response for any onsite fire or bushfire is the immediate notification of DFES.
  - The priority response action for a bushfire is immediate evacuation of all onsite personnel to offsite safer location (away from bushfire) ahead of bushfire impact on the site, and before bushfire impact (including smoke) on the vehicular access network to the offsite location.

- Notification of fire brigade at least seven days prior to the commissioning of any renewable energy infrastructure at the facility, especially the BESS units.
- Engage with fire brigade to offer a familiarisation visit prior to commissioning, as detailed in Section 5.7.

5.5 Renewable Energy Infrastructure Operation, Maintenance and Housekeeping

The following shall be conducted as part of ongoing operation and maintenance phases:

- Ensure ongoing compliance with the endorsed BMP and BRMP is achieved, especially prior to, and during, bushfire season. This includes all vegetation management, internal road access, fire system and firewater obligations.
- Ensure all Dangerous Goods (if any) comply with all relevant legislation, Australian Standards and requirements detailed in Section 5.9.
- Develop, implement and review Emergency Information Book and Signage (see Section 5.6) for attending emergency services personnel.
- Develop, implement and review the Emergency Management Plan (see Section 5.8)
- Ensure inspection, maintenance and any required repair activities are conducted by the Proponent for all renewable energy infrastructure, associated equipment, fire systems, communication systems, and vehicles at the facility, in line with relevant Australian Standards and manufacturers requirements.

  With respect to the BESS units, this should include the following:
  - A schedule, list of activities and accountabilities for the inspecting, testing, monitoring and servicing of the battery and its monitoring, safety and protective systems.
  - Monthly inspections of battery enclosures/ containers and related infrastructure for physical damage. Any damage must be immediately assessed and rectified by a suitably qualified person.
  - Regular inspection and removal of all combustible materials near the battery enclosures/containers and related infrastructure.

5.6 Emergency Information Book and Signage

An Emergency Information Book and/or signage must be located at the nominated site entrance to the facility, with any plans or information books provided in a weatherproof container (unless otherwise agreed with DFES).

The Emergency Information Book and/or signage is intended to provide to emergency responders with an overview of the facility. This information should be developed in liaison with relevant emergency services representatives (if possible) and should seek to include the following:

- A description of the premises, its infrastructure and operations.
- Up-to-date contact details for site personnel, regulatory authorities and site neighbours.
- Site plans that depict the entire site layout, including:
  - Buildings, substations and renewable energy infrastructure (including BESS units),
  - Internal roads and surrounding public roads
  - Fire protection systems and equipment, including firewater tanks
  - Grid connections, drains and isolation valves,
  - Dangerous goods storage areas
  - Neighbours and
  - North direction and scale

- The following BESS details, plans and information:
    - Schematics and technical data for BESS units, the number of units on-site, and the number of battery racks or modules within each unit.
    - Details of the hazards for the BESS, including thermal events/runaway, electrical safety hazards, explosion hazards, dangerous goods hazards (including off-gassing), and the effects of fire on the BESS (e.g., explosion, release of toxic gases).
    - Details of all provided battery failure/safety and protective systems, including a description, the activation process/automatic trigger, and any hazards associated with these systems.
    - Specifications for safe operating conditions for temperature.
    - Details of the elements monitored/controlled by the Battery Management System (BMS), including internal temperature, state of charge, voltage, etc. and the locations this information is available.
    - The shutdown and/or isolation procedures if the BESS are involved in fire or emergency incident, and appropriate personnel contact details for verifying that the battery enclosure/container system has been isolated/shutdown and de-energised during emergencies.
- The following solar PV system details and information:
    - Specifications for safe operating conditions for temperature, and the hazards related to electricity generation at the facility.
    - Emergency procedures for isolation and shutdown where solar panels and/or related infrastructure are involved in fire.
    - Emergency procedures for fires within the vicinity of solar energy facilities.
- Details of any emergency equipment, including the type and location of fire and gas detection and suppression systems.
- A manifest of dangerous goods (if required) and Safety Data Sheets (SDS) for dangerous goods stored on-site.
- Procedures for the management of emergencies, including evacuation, shelter-in-place (for facilities at risk of bushfire), containment of spills and leaks, and fire procedures (including infrastructure/plant fires, vehicle fires, bushfire)

A review of the information contained within the facility's Emergency Information Book and signage must be undertaken prior to commencement of bushfire season annually.

5.7 Emergency Services Familiarisation

Prior to commissioning of the facility, a familiarisation visit and explanation of the proposed facility, the specific hazards, the proposed fire safety systems and management measures, and the emergency procedures, is to be offered to local fire brigades and other emergency services.

The opportunity should be taken to ensure that the information in the proposed Emergency Information Book/Signage (see Section 5.6) is appropriate for their needs, and that they are familiar with where this will be located.

Additionally, it should be confirmed that any required keys or access codes to any secured parts of the site have been (or will be) supplied to the relevant fire brigade personnel.

A schedule for ongoing site familiarisation to account for changing personnel, facility infrastructure and hazards, and emergency exercises should be developed in conjunction with the local fire brigade.

5.8 Emergency Management Plan

The Proponent is to develop an emergency management plan for the facility, which comprehensively details the procedures for preparing for, and responding to, hazards to the facility, including the following for off-site bushfire, and on-site fire, emergencies:

- Facility details including key contacts and technical support during an emergency, site plan, details of renewable energy infrastructure, details of fire and emergency systems, and a manifest of dangerous goods.
- The identified risks and hazards associated with the renewable energy infrastructure, such as onsite fire, bushfires.
- Detail preparedness and pre-emptive actions to address the above hazards, including the following for onsite infrastructure fires and bushfire:
    - Ongoing compliance with the approved BMP and BRMP.
    - Ensuring ongoing maintenance of all buildings, fire and communication systems.
    - Determining forecast Fire Danger Rating (FDR), Total Fire Bans (TFB) and Harvest Vehicle Movement Bans (HVMB), during bushfire season
    - Modifying Site Activities (based on Forecast FDR and TFB).
    - Modifying Site Activities (based on Declared HVMB).
    - Monitoring DFES Bushfire Emergency Warnings for bushfire (and/or other signs of bushfire activity) within 50 km of the facility, and understanding the decision-making triggers.
- Detail emergency response procedures to address to all identified hazards including for onsite infrastructure fires, bushfire and management of firewater runoff.
- For a bushfire emergency, the response should include the following:
    - The immediate response to any onsite bushfire, or bushfire observed in the local area, is to notify DFES and local fire brigade immediately.
    - Conducting early offsite evacuation of all staff away from the bushfire if safe to do so (preferred response), ideally to Eneabba, Three Springs or Carnamah townsite may also be considered in order to travel away from approaching bushfire.
        - Essential staff should only remain onsite if directed by authorised DFES/local fire brigade personnel.
    - Conduct facility shutdown, If safe to do so prior to staff evacuation:
        - Reducing the facility to a low energy state (including discharging the BESS), in consultation with authorised DFES personnel (where possible)
        - Ensure all other buildings and plant are properly secured.
        - Ensure all vehicular access routes are open and available for use.
        - Ensure all fire and communications systems are ready for use.
    - If there is insufficient time to safely travel offsite without being impacted by bushfire, conduct onsite shelter in place in the O&M building.
        - It is noted that this building is not constructed for onsite refuge from bushfire and should only be considered as a last resort option only if offsite evacuation is not possible.
- Response to onsite fire, including BESS fire, is to include:
    - Immediately notify DFES to enable a rapid turnout, and relevant facility personnel

- Strongly consider full emergency shutdown of the BESS and substation unless there are mitigating circumstances. This should be conducted in consultation with authorised DFES personnel (where possible).
- If fire is within the BESS unit/s, ensure staff relocate as far as possible from the fire, and no less than 50 m away.
- If fire is not in the BESS (e.g. in solar farm), and it is safe to do so, trained personnel to conduct first attack response on any spot fires with mobile fire trailer, until DFES arrival.
- Notify neighbouring landowners.

The emergency management plan is to be reviewed regularly, and the relevant staff will need appropriate training and to conduct regular exercises to ensure everyone is fully conversant with the requirements of the plan and able to respond as required during all emergencies. Training should be conducted annually prior to bushfire season, and regular exercises conducted throughout the year.

The above is a high-level summary, with further specific detail on the requirements of the emergency management plan relating to bushfire and onsite infrastructure fire is provided in Appendix 9.

5.9 Dangerous Goods

The proposed development will contain dangerous goods (BESS units), with the storage and use of these onsite potentially increasing the risk of fire ignition at the proposed development.

The Proponent will be required to ensure there are strict controls on these potential ignition sources, such as storage and handling controls in accordance with the Dangerous Goods legislation and code, relevant Australian Standards and restrictions on hot works and electrical equipment within any on-site hazardous areas.

Should the facility propose any additional significant quantities of dangerous goods onsite such that the storage and use of these could potentially increase the risk of fire ignition at the proposed development, the Proponent will be required to do the following, with the final siting and bushfire risk management to be reviewed by an accredited bushfire practitioner:

- Ensure they are sited in areas of BAL-29 or lower as a minimum, and
- Protect from bushfire impact.

5.10 Building construction standards

Bushfire construction provisions of the National Construction Code require that buildings comply with the AS 3959 construction requirements, in accordance with the assessed BAL under AS 3959, provided the building is a Class 1, 2, 3 or associated Class 10a building/deck, or a “certain Class 9” building.

The proposed buildings are not expected to be any of the classifications nominated above, therefore in accordance with the National Construction Code, and as such, there is no statutory requirement for proposed buildings to meet the construction requirements of AS 3959.

Notwithstanding, given the nature of the proposed use and location, and that like all buildings there is potential vulnerability to bushfire and ember attack, it is recommended that consideration is given to voluntarily constructing buildings to the assessed BAL rating, or even just the requirements of BAL-12.5, to provide some resilience bushfire impact. It is noted that this is not a mandatory requirement, and simply a recommendation for consideration.

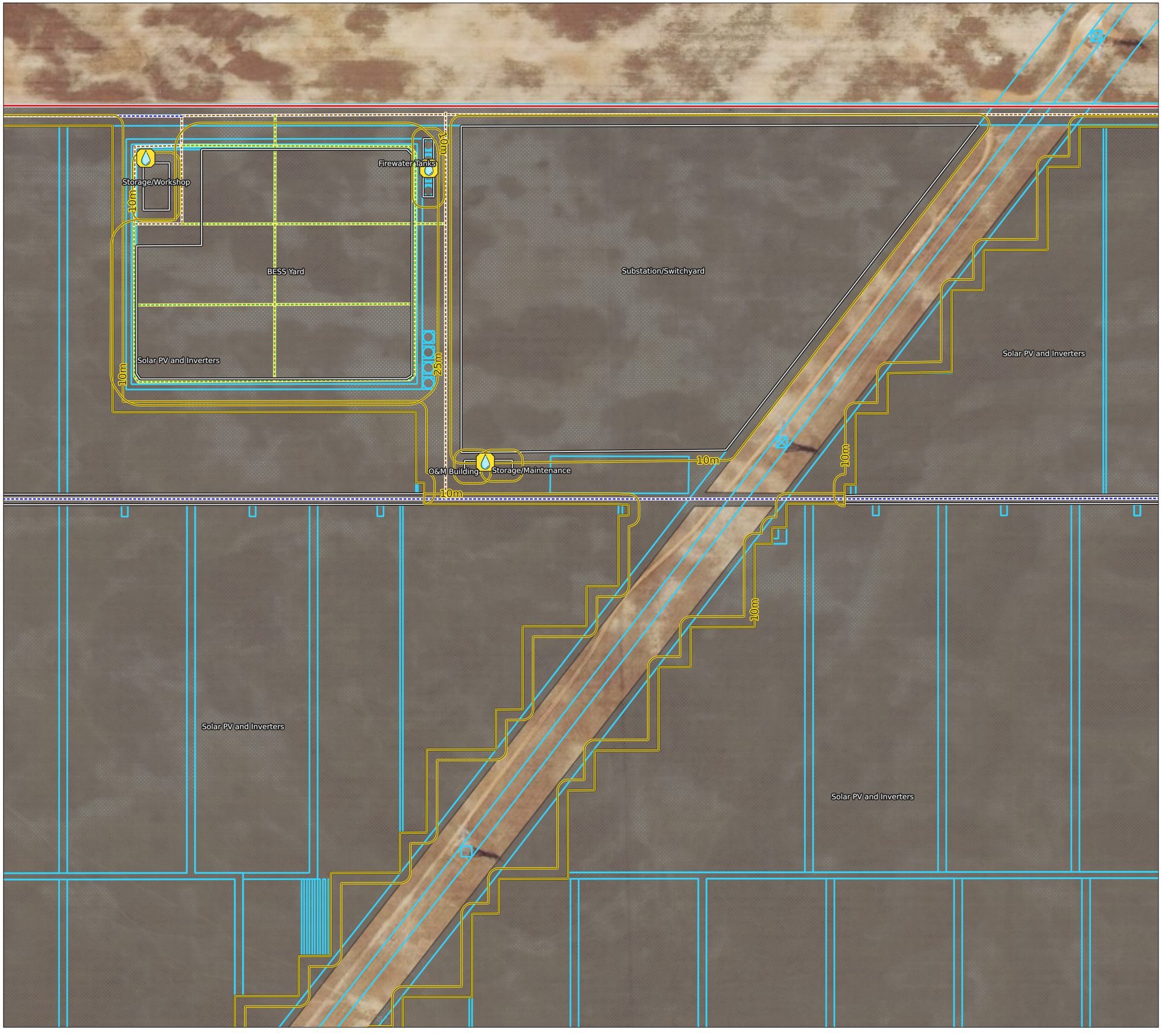
5.11 Compliance with annual firebreak notice

The Proponent is to comply with the current Shire of Three Springs annual firebreak notice as

amended (refer to Appendix 8).

While the firebreak notice requires that a 3 m wide trafficable perimeter firebreak is established as close as possible to all external boundaries, the internal loop road is considered to provide this function for the proposed development. Notwithstanding, the Proponent may need to seek variation of the firebreak notice with the Shire, unless they are the decision-maker who endorses the BMP. The landowner would still need to comply with the balance of the lot outside the scope of this BMP (e.g. provision of perimeter firebreak).

The mitigation measures detailed in the firebreak notice must be in place from 1 November to 28 February each year.



Legend

Mitigation Measures

- Firewater Tank
- Internal Road (to Buildings)
- Internal Road (to Solar Panels and Inverters)
- Internal Road (to/within BESS yard)
- Buildings/Infrastructure
- Project Area
- Cadastre
- Asset Protection Zone

Classified Vegetation

- Modified to non vegetated and low threat

Scale 1:3,300

0 50 100 150 Metres

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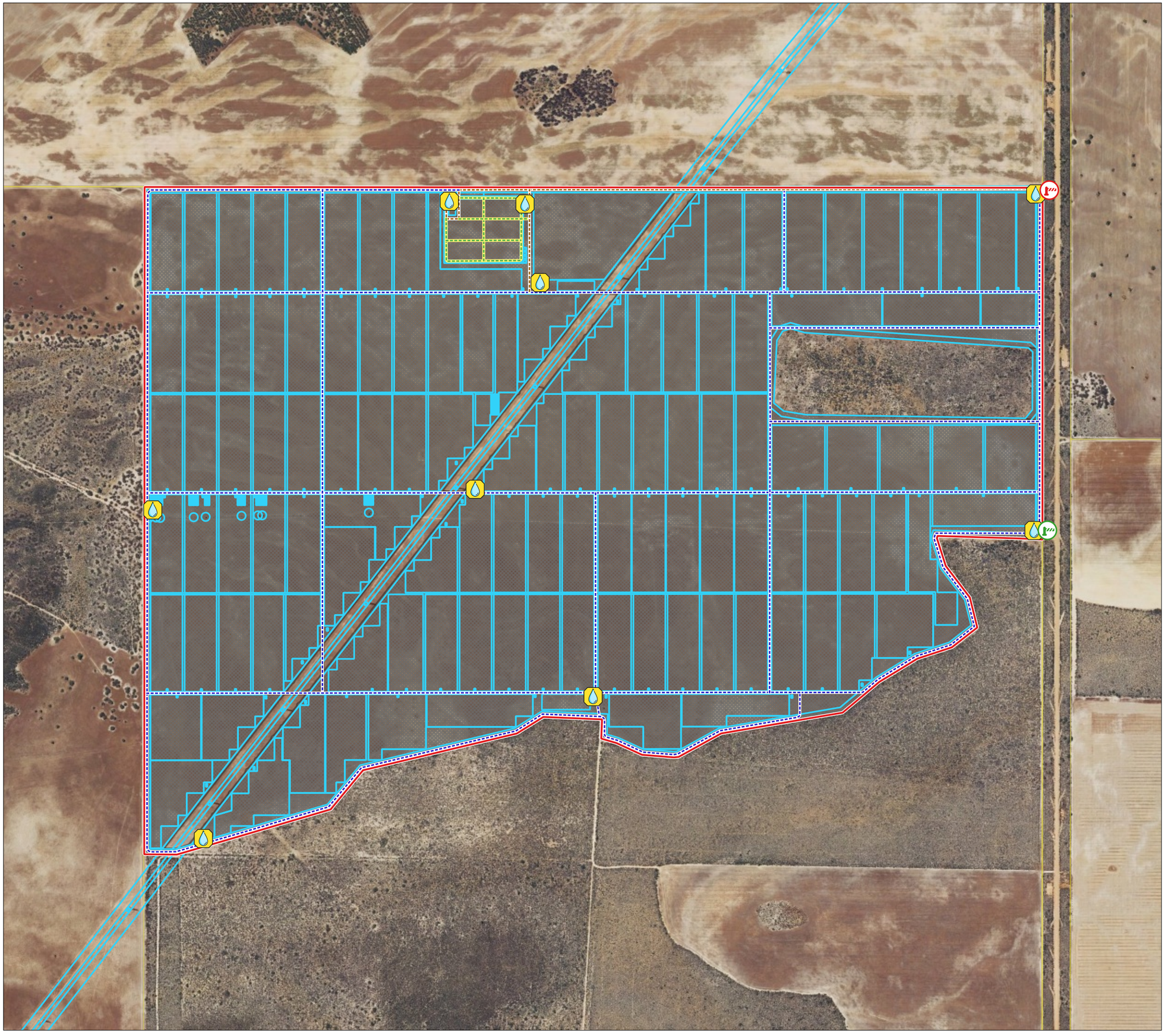
E linden@linfire.com.au

Trina Solar

Tathra Solar and BESS Facility

Figure 8: Bushfire Management Measures (Proposed Buildings. BESS and Substation)

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Legend

Mitigation Measures

- Main Site Entrance
- Alternative Site Entrance
- Firewater Tank
- Internal Road (to Buildings)
- Internal Road (to Solar Panels and Inverters)
- Internal Road (to/within BESS yard)
- Project Area
- Cadastre

Classified Vegetation

- Modified to non vegetated and low threat

Scale 1:12,500

0 200 400 600 Metres

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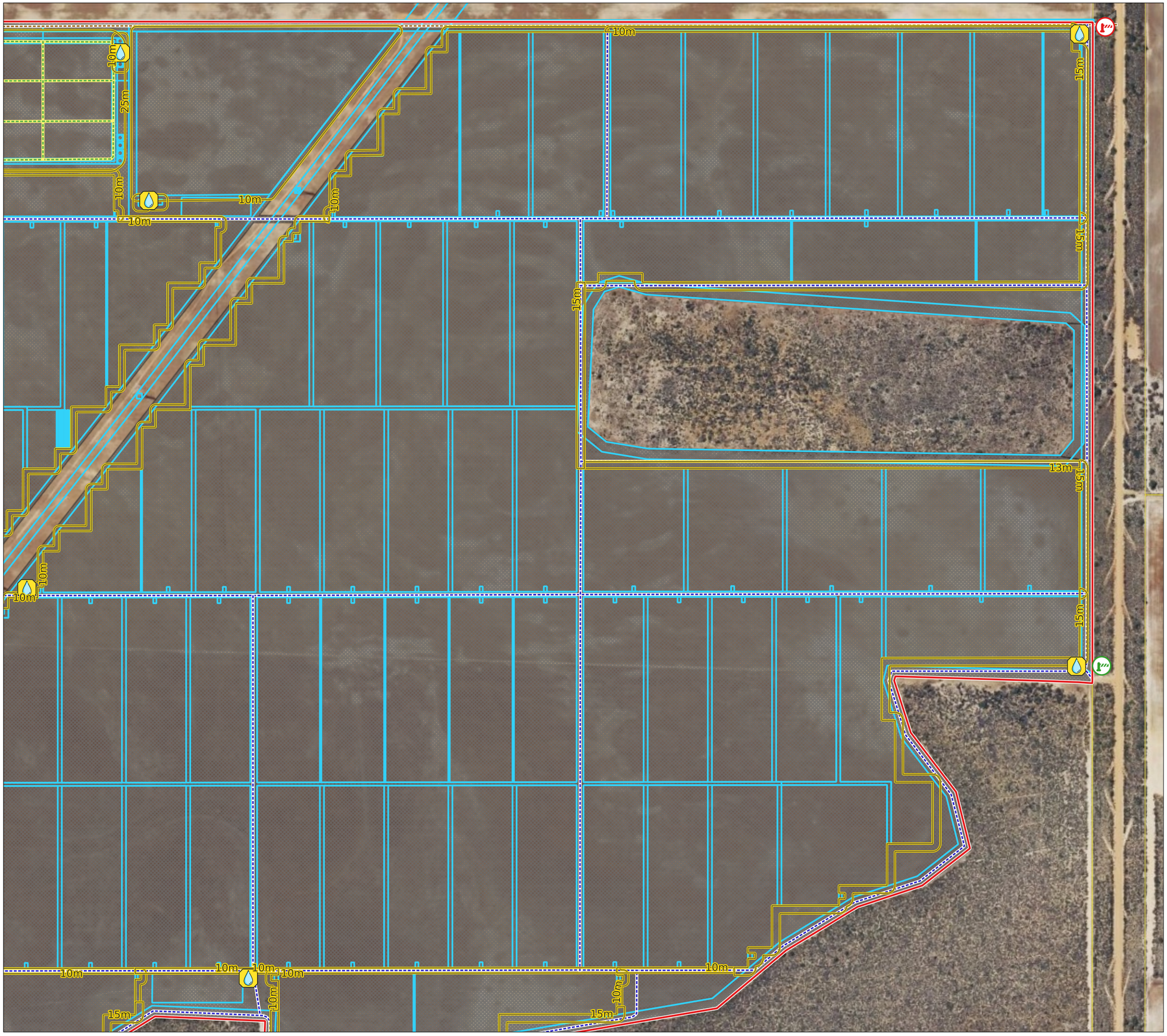
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Figure 9: Bushfire Management Measures (Overall - Vehicular Access and Firewater)

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Legend

Mitigation Measures

- Main Site Entrance
- Alternative Site Entrance
- Firewater Tank
- Internal Road (to Buildings)
- Internal Road (to Solar Panels and Inverters)
- Internal Road (to/within BESS yard)
- Project Area
- Cadastre
- Asset Protection Zone

Classified Vegetation

- Modified to non vegetated and low threat

Scale 1:6,700

0 100 200 300 Metres

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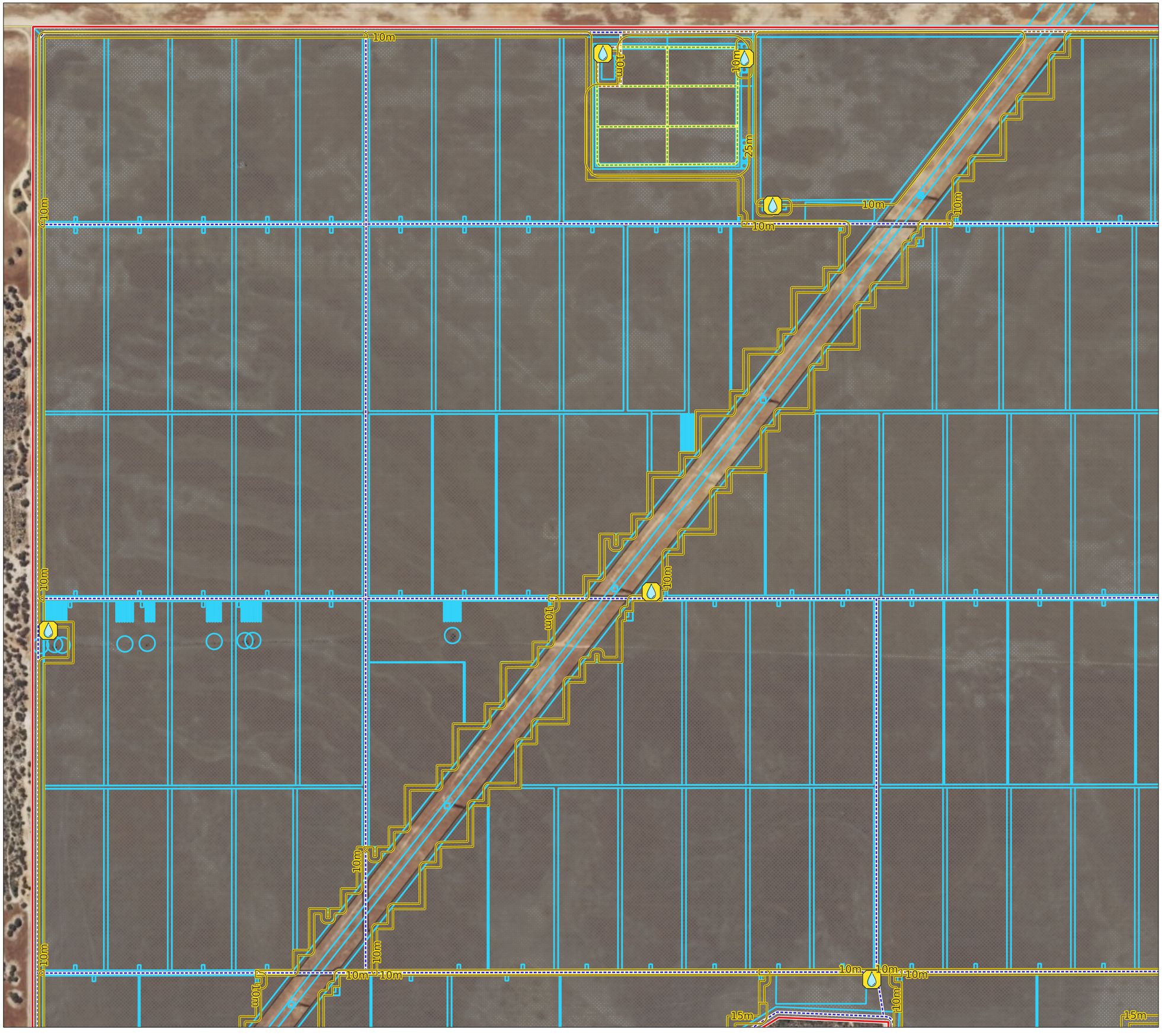
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Figure 10: Bushfire Management Measures (Overall - East)

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Legend

Mitigation Measures

- Firewater Tank
- Internal Road (to Buildings)
- Internal Road (to Solar Panels and Inverters)
- Internal Road (to/within BESS yard)
- Project Area
- Cadastre
- Asset Protection Zone

Classified Vegetation

- Modified to non vegetated and low threat

Scale 1:6,700

0 100 200 300 Metres

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Figure 11: Bushfire Management Measures (Overall - North-West)

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Legend

Mitigation Measures

- Firewater Tank
- Internal Road (to Solar Panels and Inverters)
- Project Area
- Cadastre
- Asset Protection Zone

Classified Vegetation

- Modified to non vegetated and low threat

Scale 1:6,700

0 100 200 300 Metres

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Figure 12: Bushfire Management Measures (Overall - South-West)

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6.0 Assessment against the bushfire protection criteria

6.1 Compliance table

An acceptable solutions assessment against Bushfire Protection Criteria 7 (Development – Commercial and Industrial) is provided below in Table 5.

Table 5: Compliance with Bushfire Protection Criteria 7 (Development – Commercial and Industrial) of the Guidelines

Bushfire protection criteria		Development response	
Outcomes	**Acceptable Solutions**	**Method of compliance**	**Proposed bushfire management measures**
Element 1: Location			
Not Applicable	Area 1: Not Applicable Area 2: Not Applicable	**Not Applicable**	Not Applicable
Element 2: Siting and Design			
Outcome O2 Ensure siting and design solutions: • manage or mitigate the bushfire risk to people, property and infrastructure; and • avoid, or where unavoidable, minimises the clearing of native vegetation	A2.1a Siting and Design Every habitable building achieves radiant heat impact not exceeding 29 kW/m² (BAL-29). A2.1b Siting in an area with a radiant heat impact exceeding 29 kW/m² (BAL-40 or BAL-FZ) The siting of a commercial or industrial habitable building, with a radiant heat impact exceeding 29 kW/m2 (BAL-40 or BAL-FZ) should only be considered where: • the lot was created prior to December 2015; and • there are demonstrated site characteristics and/or biodiversity or conservation values that prevent the achievement of a radiant heat impact not exceeding 29 kW/m2 (BAL-29); and • it is demonstrated that the reduction of the building footprint or a redesign to manage or mitigate the risk, is not practical or appropriate. If the provision of an APZ in accordance with Acceptable Solution A2.2 cannot be achieved, then the vegetation immediately surrounding the building is to be managed as defendable space in accordance with Appendix B.2, Table 9 – APZ technical requirements.	**Acceptable Solution**	A2.1a Siting and Design The BAL contour plan (see Figure 6 and 7, and Appendix 3) assumes that the majority of the project area, namely Plot 8, is to be maintained as non-vegetated land or low threat vegetation as required by the BMP, by the Proponent for the life of the project. Upon completion of development, and the vegetation management works including implementation of all nominated Non-Vegetated Zone (NVZ) and Asset Protection Zone (APZs) around the perimeter of the following as detailed in A2.2 below: • O&M building, Storage/Maintenance building and Storage/Workshop building to ensure they are sited in BAL-29 or less • Substation/switching station envelope (likely to house several buildings) to ensure any buildings are sited in BAL-29 or less. • Firewater tank/s to ensure they are sited in BAL-29 or lower • While the following are not buildings, the BRMP that accompanies this BMP also nominates additional vegetation modification and management requirements for the renewable energy infrastructure (see Section 5.1.2) to achieve the following: ◦ BESS containers will be sited in BAL-12.5 or less ◦ Substation/switching station envelope (infrastructure) will be sited in BAL-29 or less ◦ Solar panels and inverter stations will be sited in BAL-29 or less ◦ All other renewable energy infrastructure is sited in BAL-29 or lower. ◦ Firewater tanks associated with renewable energy infrastructure will be sited in BAL-29 or less All proposed buildings (and the firewater tanks associated with buildings) will be sited in BAL-29 or lower, and on this basis, compliance with A2.1a is achieved. Should any habitable building be required other than that nominated above, the required separation shall be assessed by an accredited bushfire practitioner. A2.1b Siting in an area with a radiant heat impact exceeding 29 kW/m² (BAL-40 or BAL-FZ) As detailed above, upon completion of development, all proposed habitable buildings will be sited in areas of BAL-29 or lower.
	A2.2 Asset Protection Zone (APZ) Where a habitable building cannot be wholly within an area with a radiant heat impact not exceeding 29 kW/m² (BAL-29) in its predevelopment state, an APZ is to be provided and meet the following requirements: **Width**: the APZ is to be measured from any external wall or supporting post or column of the building, and of sufficient size to ensure the radiant heat impact of a bushfire does not exceed 29 kW/m² (BAL-29) to any part of the building, in all	**Acceptable Solution**	Upon completion of development, the majority of the project area (Plot 8) is to be maintained as non-vegetated land or low threat vegetation by the Proponent, for the life of the project). In order to manage the bushfire risk to the buildings and firewater tanks associated with the buildings (i.e. required for bushfire fighting water supply) the following NVZ/APZs are required to ensure sufficient separation is to be provided: • 10 m wide NVZ/APZ around the perimeter of the following to achieve BAL-29 or lower on any buildings:

Bushfire protection criteria		Development response	
Outcomes	**Acceptable Solutions**	**Method of compliance**	**Proposed bushfire management measures**
	circumstances. **Location:** the APZ is to be contained solely within the boundaries of the lot, except in instances where: • the vegetation on the adjoining lot(s) is, and will continue to be, low threat as per Clause 2.2.3.2 of AS 3959 or the requirements of Appendix B.2, Table 9 – APZ technical requirements, or an alternative standard in a gazetted local planning scheme, on an ongoing basis in perpetuity; or • the adjoining land is and will remain in perpetuity, non-vegetated **Management:** the APZ is managed in accordance with the requirements of Appendix B.2, Table 9 – APZ technical requirements, or an alternative standard in a gazetted local planning scheme.		◦ O&M building ◦ Storage/Maintenance building ◦ Storage/Workshop building (near BESS yard) ◦ Substation/Switchyard envelope • 10 m wide NVZ/APZ around any firewater tanks associated with the above buildings, to achieve BAL-29 or lower, and provide separation from any renewable energy infrastructure. ◦ No renewable energy infrastructure is permitted in the 10 m NVZ/APZ around any firewater tanks Where stipulated, the NVZ/APZ must be non-vegetated, however outside this they can be either non-vegetated or managed low threat landscaping established in accordance with the APZ standards from the WA Guidelines (see Appendix 4) and AS 3959 Clause 2.2.3.2 (e) and (f) (see Appendix 5), however would preferably be non-vegetated where possible. All onsite vegetation modification and management (including NVZ/APZ) is to be conducted and maintained by the Proponent for the life of the facility. It is noted that there is minor NVZ/APZ incursion into the Western Power transmission corridor (in addition to internal road crossings), and the Proponent will need to secure the necessary permissions from Western Power to implemented to clear and maintain vegetation their land. In addition to the requirements above for habitable buildings proposed as part of this development, the BRMP that accompanies this BMP also nominates additional vegetation modification and management requirements for the renewable energy infrastructure, which are summarised in Section 5.1.2.
	A2.3 Clearing of native vegetation The development avoids, or where unavoidable, minimises the clearing of native vegetation.	**Acceptable Solution**	The project area has historically been used for agricultural purposes, and is currently grassland vegetation. The proposed development will result in clearing of all the existing grassland vegetation within the project area, to accommodate the buildings and infrastructure. Linfire assumes all relevant environmental approvals will be secured prior to commencing any on-site vegetation modification or clearing required to construct the development or implement this BMP.
	A2.4 Storage of hazardous, flammable and/or combustible materials Where a proposed land use will include the storage of hazardous, flammable and/or combustible materials as part of its ongoing day to day operations, the materials are to be stored in an area that: • is subject to a radiant heat impact not exceeding 29 kW/m2 (BAL-29); • is non-combustible and shields the materials to reduce their exposure to radiant heat from the bushfire to levels significantly lower than 29 kW/m^2 and prevents the entry of debris and embers; and • limits to the degree necessary and practical, the escape of sources of ignition from the stored materials into bushfire prone vegetation.	**Acceptable Solution**	The proposed BESS units will contain Li-ion batteries (or similar) that will be classified as Dangerous Goods. The project BRMP that accompanies this BMP to demonstrate the renewable energy infrastructure bushfire risk management measures comply with that of the CFA Guidelines, including reviewing and assessing the potential risk to and from the BESS units. Based on this, the BESS units are required to be sited in BAL-12.5 or lower, and 17 m wide NVZ/APZ has been nominated around the BESS cells, with all land within the cells to be non-vegetated. Additionally, the BESS containers are to be non-combustible material and ember protection is to be provided to prevent ember ingress penetrating in battery containers/enclosures and thermal management systems (see Section 5.4.1). The BESS units, and any other significant quantities of Dangerous Goods onsite (if any), will need to comply with all relevant Dangerous Goods legislation, codes and standards. Should significant quantities of dangerous goods (other than the BESS batteries) be stored or handled onsite, these should be reviewed by a BPAD Level 3 bushfire practitioner to ensure they are sited in areas of BAL-29 or lower, and appropriately protected from bushfire impact.
Element 3: Vehicular access			
Outcome O3 Ensure the design and capacity of vehicular access and egress provide: • for efficient and effective evacuation to a suitable destination(s) and/or • as a contingency measure for vulnerable land uses, an on-site shelter, where demonstrated appropriate, as a last resort option.	A3.1 Private Driveway There are no private driveway technical requirements (prescribed by these Guidelines) where the private driveway is within a lot serviced by reticulated water and is no greater than 70 metres in length between the most distant external part of the habitable building and the public road. In circumstances where the above conditions are not met, the private driveway is to meet all of the following requirements: • requirements in Appendix B.3 Table 10, Column 5; and • passing bays every 200 metres with a minimum length of 20 metres and a	**Acceptable Solution**	No public roads are proposed as part of this development. The existing public road nearest the project area is Turkey Flat Road, which is an usealed two-way road and appears compliant with Guidelines and sufficient for occupant egress and emergency services access. As detailed in Section 5.2.1, the internal road accessing the proposed buildings is to comply with the requirements of A3.1, including the following: • Comply with the requirements in Appendix B.3 Table 10, Column 5 (see Appendix 6) ◦ While the preference is that internal roads are at least 6 m wide, where >4 m wide but <6m wide, passing bays are to be provided every 200 m that are 6m wide x 20m long.

Bushfire protection criteria		Development response	
Outcomes	**Acceptable Solutions**	**Method of compliance**	**Proposed bushfire management measures**
	minimum additional carriageway width of 2 metres (i.e. the combined carriageway width of the passing bay and constructed private driveway to be a minimum 6 metres); and • turn-around area (Figure 30) and within 30 metres of the habitable building (Figure 38).		• Provide compliant turnarounds (see Appendix 6) or loop roads within 30 m of each proposed building • Provide access to within 4 m of the firewater tanks (or tank suction connection) in accordance with A4.1, to enable attending fire appliances to refill, and provide hardstand adjacent to tank suction connection and sufficient locations for fire appliance turnaround. • Any gates, including those at site entrances, are to have a clear opening of no less than 6 m. ○ If any site entrances are to be locked, keys are to be provided to DFES/local fire brigades prior to operation. The proposed development currently provides two vehicular access entrances to the facility from Turkey Flat Road, with the internal roads configured as a perimeter loop road network with several interconnecting roads also provided, which passes within 30 m of all proposed buildings. All access gates are to open at least 6 m wide. The Proponent is responsible for the construction and ongoing management of internal roads and vehicular access gates. In addition to the requirements above for access to the building envelope, the project BRMP that accompanies this BMP also nominates additional internal vehicular access arrangement for the renewable energy infrastructure, which are summarised in Section 5.2.2.
Element 4: Water			
Outcome O4 Ensure that sufficient water is available to enable people, property and infrastructure to be defended from bushfire.	A4.1 Water Supply Where a reticulated water supply is existing or proposed, a hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority. Where these specifications cannot be met, a water tank(s) should be provided in accordance with the requirements of Appendix A.4, Table 11 – Water supply dedicated for bushfire firefighting.	**Acceptable Solution**	Given there is no nearby reticulated town main water supply or street hydrants, the bushfire fighting water supply for the proposed buildings will need to be from static firewater tank/s as follows (see Section 5.3.1): • That have no less than 10 kL per building in accordance with the WA Guidelines. ○ This firewater requirements for the proposed buildings, can either be stored in a separate firewater tank, or combined with (i.e. added to) the firewater tank/s required for the renewable energy infrastructure (see Section 5.3.2). • Comply with the relevant technical requirements from the WA Guidelines (see Appendix 7) and the following requirements from the CFA Design Guidelines: ○ Must be an above-ground water tank constructed of concrete or steel and must comply with AS 2419.1 and signage indicating 'FIRE WATER' (or similar approved) and the tank capacity must be fixed to each tank. ○ The static water storage tanks must be located at vehicle access points to the facility and must be positioned at least ten (10) metres from any infrastructure (e.g. BESS, solar panels etc.). ○ The hard-suction point must be positioned within 4 m to a hardstand area, and protected from mechanical damage where necessary, and provide a clear access for emergency services personnel. The firewater tank is to be sited within the subject site in an area of BAL-29 or lower. The firewater tank is to be installed, filled and maintained for the life of the project by the Proponent. In addition to the requirements above for firewater to the building envelope, the project BRMP that accompanies this BMP also nominates additional firewater tanks around the project area for the renewable energy infrastructure, which are summarised in Section 5.3.2.

7.0 Responsibilities for implementation and management of the bushfire measures

Implementation of the BMP and BRMP applies to the Proponent to ensure bushfire management measures are adopted and implemented on an ongoing basis. A bushfire responsibilities table is provided in Table 6 to drive implementation of all bushfire management works associated with this project.

Table 6: Responsibilities for implementation and management of the bushfire measures

Implementation/management table	
No	***Implementation action***
Proponent (Buildings) - prior to building occupation	
1	Establish non-vegetated and low threat vegetation across Plot 8, and additional requirements of NVZ/APZ around proposed buildings, substation/switchyard envelope and associated firewater tanks, in accordance with the dimensions and standards detailed in Section 5.1.1 of the BMP. The Proponent is to secure any necessary approvals from Western Power to clear and manage vegetation within their transmission easement (if required).
2	Construct the internal driveway from the main site entrance to proposed buildings, substation/switchyard envelope and associated firewater tank/s, in accordance with the dimensions and standards detailed in Section 5.2.1 of the BMP. Construct the site entrance gates to the standards stated in the BMP, and ensure keys to any locked gates are provided to all relevant staff and onsite personnel, as well as being made available to DFES and local fire brigade.
3	Install the static firewater tank for the buildings in accordance with the requirements detailed in Section 5.3.1 and relevant Australian Standards.
4	Should any significant quantity of Dangerous Goods be proposed as part of development (other than proposed BESS batteries), comply with all relevant Dangerous Goods legislation, codes and relevant Australian Standards, as detailed in Section 5.9 of the BMP.
5	Comply with the Shire of Three Springs firebreak notice as it applies to the facility, as detailed in Section 5.11 of the BMP. Seek any necessary firebreak notice variations, if required.
Proponent (Renewable Energy Infrastructure) - prior to commissioning and facility occupation	
1	Establish non-vegetated and low threat vegetation across Plot 8, and additional requirements of NVZ/APZ around proposed renewable energy infrastructure, in accordance with the dimensions and standards detailed in Section 5.1.2 of the BMP.
2	Construct the internal driveway network to the renewable energy infrastructure (BESS, solar PV arrays, substation), in accordance with the dimensions and standards detailed in Section 5.2.2 of the BMP. Construct the site entrance gates to the standards stated in the BMP, and ensure keys to any locked gates are provided to all relevant staff and onsite personnel, as well as being made available to DFES and local fire brigade.
3	Install the firewater system for the renewable energy infrastructure in accordance with the requirements detailed in Section 5.3.2 of the BMP and relevant Australian Standards.
4	Provide a mobile fire trailer for the facility in accordance with the requirements detailed in Section 5.3.3 of the BMP.
5	Incorporate all the renewable energy infrastructure design, construction, installation and commissioning requirements detailed in Section 5.4 of the BMP for the facility.
6	Ensure any facility operation, maintenance and housekeeping requirements are in place prior to operation, as detailed in Section 5.5 of the BMP.

Implementation/management table	
No	***Implementation action***
7	Prepare and install the Emergency Information Book and signage in accordance with the requirements of Section 5.6 of the BMP.
8	Conduct the emergency services familiarisation site visit, in accordance with the requirements of Section 5.7 of the BMP.
9	Develop and implement the site emergency management plan, incorporating the recommended procedures for bushfire and onsite fire, detailed in Section 5.8 of the BMP
10	Comply with the Shire of Three Springs firebreak notice as it applies to the facility, as detailed in Section 5.11 of the BMP.
Proponent (Buildings)– ongoing (for life of project)	
1	Maintain the non-vegetated and low threat vegetation across Plot 8, and additional requirements of NVZ/APZ around proposed buildings, substation/switchyard envelope and associated firewater tanks, in accordance with the dimensions and standards detailed in Section 5.1.1 of the BMP.
2	Maintain the internal driveway from the main site entrance to proposed buildings, substation/switchyard envelope and associated firewater tank/s, in accordance with the dimensions and standards detailed in Section 5.2.1 of the BMP.
3	Maintain the static firewater tank for the buildings in accordance with the requirements detailed in Section 5.3.1 and relevant Australian Standards. Ensure the firewater tanks remain filled at all times, especially during bushfire season.
4	Review whether there are any introduced Dangerous Goods to the facility, and comply with all relevant Dangerous Goods legislation, codes and relevant Australian Standards, and the additional requirements detailed in Section 5.9 of the BMP.
5	Comply with the Shire of Three Springs firebreak notice as it applies to the facility, as detailed in Section 5.11 of the BMP.
Proponent (Renewable Energy Infrastructure)– ongoing (for life of project)	
1	Maintain the non-vegetated and low threat vegetation across Plot 8, and additional requirements of NVZ/APZ around proposed renewable energy infrastructure, in accordance with the dimensions and standards detailed in Section 5.1.2 of the BMP.
2	Maintain the internal driveway network to the renewable energy infrastructure (BESS, solar PV arrays, substation), in accordance with the dimensions and standards detailed in Section 5.2.2 of the BMP.
3	Maintain the firewater system for the renewable energy infrastructure in accordance with the requirements detailed in Section 5.3.2 of the BMP and relevant Australian Standards. Ensure the firewater tanks remains filled at all times, especially during bushfire season.
	Maintain the mobile fire trailer for the facility in accordance with the requirements detailed in Section 5.3.3 of the BMP. Ensure the water and fuel tanks remain filled at all times, especially during bushfire season.
4	Maintain any relevant renewable energy infrastructure requirements detailed in Section 5.4 of the BMP for the facility.
5	Ensure ongoing compliance with operation, maintenance and housekeeping requirements, as detailed in Section 5.5 of the BMP.
6	Review, and if required update, the Emergency Information Book and signage in accordance with the requirements of Section 5.6 of the BMP.
7	Continue the emergency services familiarisation visits, in accordance with the requirements of Section 5.7 of the BMP.
8	Review, and if required updated, the site emergency management plan, incorporating the recommended procedures for bushfire and onsite fire, detailed in Section 5.8 of the BMP

Implementation/management table	
No	***Implementation action***
9	Conduct ongoing review of the project Bushfire Risk Management Plan (BRMP), to ensure it still accurately reflects the risks posed by the development.
10	Comply with the Shire of Three Springs firebreak notice as it applies to the BESS facility, as detailed in Section 5.11 of the BMP.

8.0 References

Department of Fire and Emergency Services (DFES) 2024, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from: https://maps.slip.wa.gov.au/landgate/bushfireprone/,

Department of Planning (DoP) 2016, *Visual guide for bushfire risk assessment in Western Australia*, Department of Planning, Perth.

Linfire 2025, *Bushfire Risk Management Plan (Renewable Energy): Trina Solar – Solar and BESS Facility,* Linfire Consultancy, Perth.

Standards Australia (SA) 2018, Australian Standard *AS 3959–2018 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.

Western Australian Planning Commission (WAPC) 2024, *State Planning Policy 3.7: Bushfire*, Western Australian Planning Commission, Perth.

Western Australian Planning Commission (WAPC) 2024, *Planning for Bushfire Guidelines*, November 2024, Western Australian Planning Commission, Perth.

Appendix 1 Vegetation plot photos and description



Photo ID: 1a



Photo ID: 1b



Photo ID: 1c



Photo ID: 1d



Photo ID: 1e



Photo ID: 1f

Plot number	Plot 1
Vegetation classification	Class G Grassland
Description / justification	Grassland greater than 100 mm in height



Photo ID: 1g



Photo ID: 1h



Photo ID: 1i



Photo ID: 1j

Plot number	Plot 1
Vegetation classification	Class G Grassland
Description / justification	Grassland greater than 100 mm in height



Photo ID: 2a



Photo ID: 2b



Photo ID: 2c



Photo ID: 2d



Photo ID: 2e



Photo ID: 2f



Photo ID: 2g



Photo ID: 2h

Plot number	Plot 2
Vegetation classification	Class G Grassland
Description / justification	Grassland greater than 100 mm in height



Photo ID: 2i

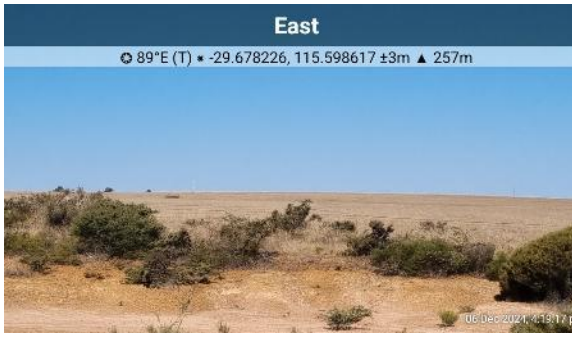


Photo ID: 2j



Photo ID: 2k



Photo ID: 2l

Plot number	Plot 2
Vegetation classification	Class G Grassland
Description / justification	Grassland greater than 100 mm in height



Photo ID: 3a



Photo ID: 3b

Plot number	Plot 3
Vegetation classification	Class C Shrubland
Description / justification	Shrub vegetation less than 2 m high at maturity



Photo ID: 4a



Photo ID: 4b



Photo ID: 4c



Photo ID: 4d

Plot number	Plot 4
Vegetation classification	Class D Scrub
Description / justification	Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity

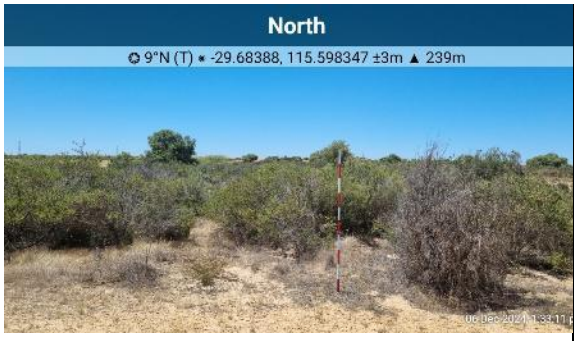


Photo ID: 5a



Photo ID: 5b



Photo ID: 5c



Photo ID: 5d



Photo ID: 5e



Photo ID: 5f



Photo ID: 5g



Photo ID: 5h

Plot number	Plot 5
Vegetation classification	Class D Scrub
Description / justification	Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity



Photo ID: 5i



Photo ID: 5j



Photo ID: 5k



Photo ID: 5l



Photo ID: 5m



Photo ID: 5n



Photo ID: 5o



Photo ID: 5p

Plot number	Plot 5
Vegetation classification	Class D Scrub
Description / justification	Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity



Photo ID: 5q



Photo ID: 5r



Photo ID: 5s

Plot number	Plot 5
Vegetation classification	Class D Scrub
Description / justification	Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity



Photo ID: 6a



Photo ID: 6b

Plot number	Plot 6
Vegetation classification	Class B Woodland
Description / justification	Trees 2-30 m at maturity, dominated by trees with a grassy understorey (lacks shrubby middle layer and deep surface litter)



Photo ID: 7a



Photo ID: 7b



Photo ID: 7c



Photo ID: 7d

Plot number	Plot 7
Vegetation classification	Excluded – Non-vegetated (Clause 2.2.3.2 [e])
Description / justification	Existing non-vegetated elements



Photo ID: 8a



Photo ID: 8b



Photo ID: 8c



Photo ID: 8d



Photo ID: 8e



Photo ID: 8f

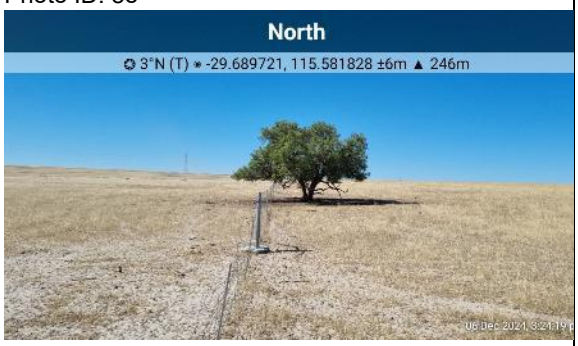


Photo ID: 8g



Photo ID: 8h

Plot number	Plot 8
Vegetation classification	Modified to non-vegetated (exclusion 2.2.3.2 [e]) and/or low threat (exclusion 2.2.3.2 [f]) state
Description / justification	Land to be modified to non-vegetated elements (roads, buildings, infrastructure) or low threat vegetation



Photo ID: 8i



Photo ID: 8j



Photo ID: 8k

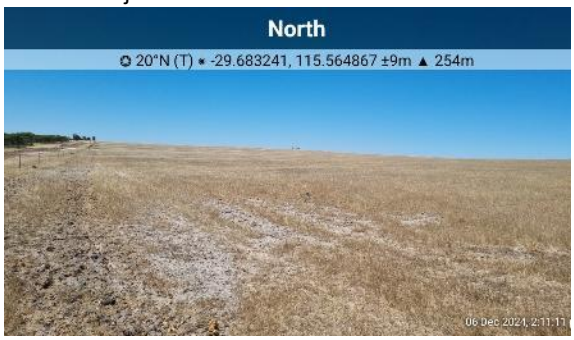


Photo ID: 8l



Photo ID: 8m



Photo ID: 8n



Photo ID: 8o



Photo ID: 8p

Plot number	Plot 8
Vegetation classification	Modified to non-vegetated (exclusion 2.2.3.2 [e]) and/or low threat (exclusion 2.2.3.2 [f]) state
Description / justification	Land to be modified to non-vegetated elements (roads, buildings, infrastructure) or low threat vegetation



Photo ID: 8q



Photo ID: 8r



Photo ID: 8s



Photo ID: 8t



Photo ID: 8u



Photo ID: 8v



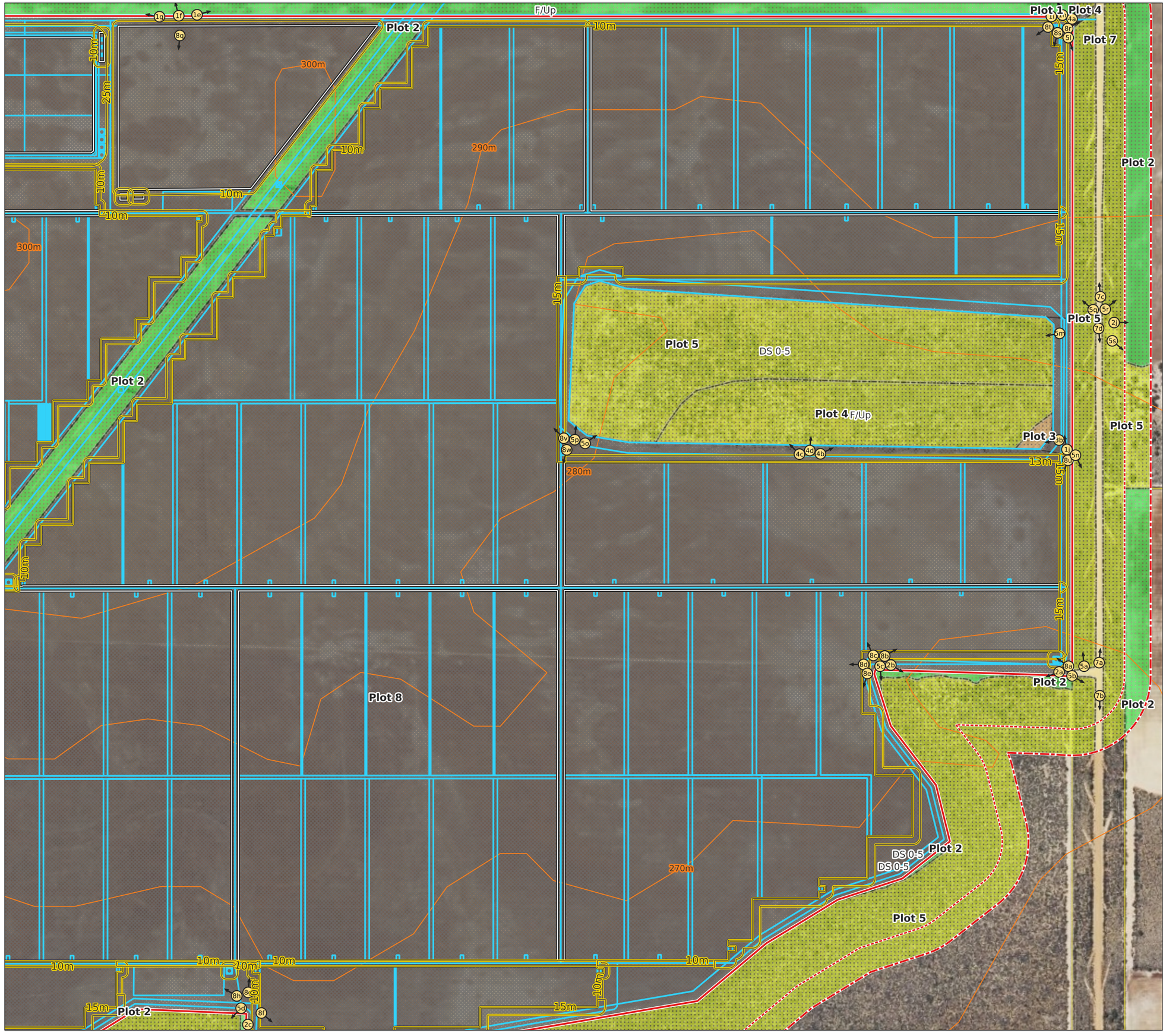
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Photo ID: 8x

Plot number	Plot 8
Vegetation classification	Modified to non-vegetated (exclusion 2.2.3.2 [e]) and/or low threat (exclusion 2.2.3.2 [f]) state
Description / justification	Land to be modified to non-vegetated elements (roads, buildings, infrastructure) or low threat vegetation

Appendix 2 Additional Post-Development Vegetation Maps



Legend

- Photo Location
- Contours
- Building Outline
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot
- Asset Protection Zone

Classified Vegetation

- C. Shrubland
- D. Scrub
- G. Grassland
- Excluded Clause 2.2.3.2(e)
- Modified to non vegetated and low threat

Scale 1:6,700

0 100 200 300 Metres

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M +61 (0)433 528 511

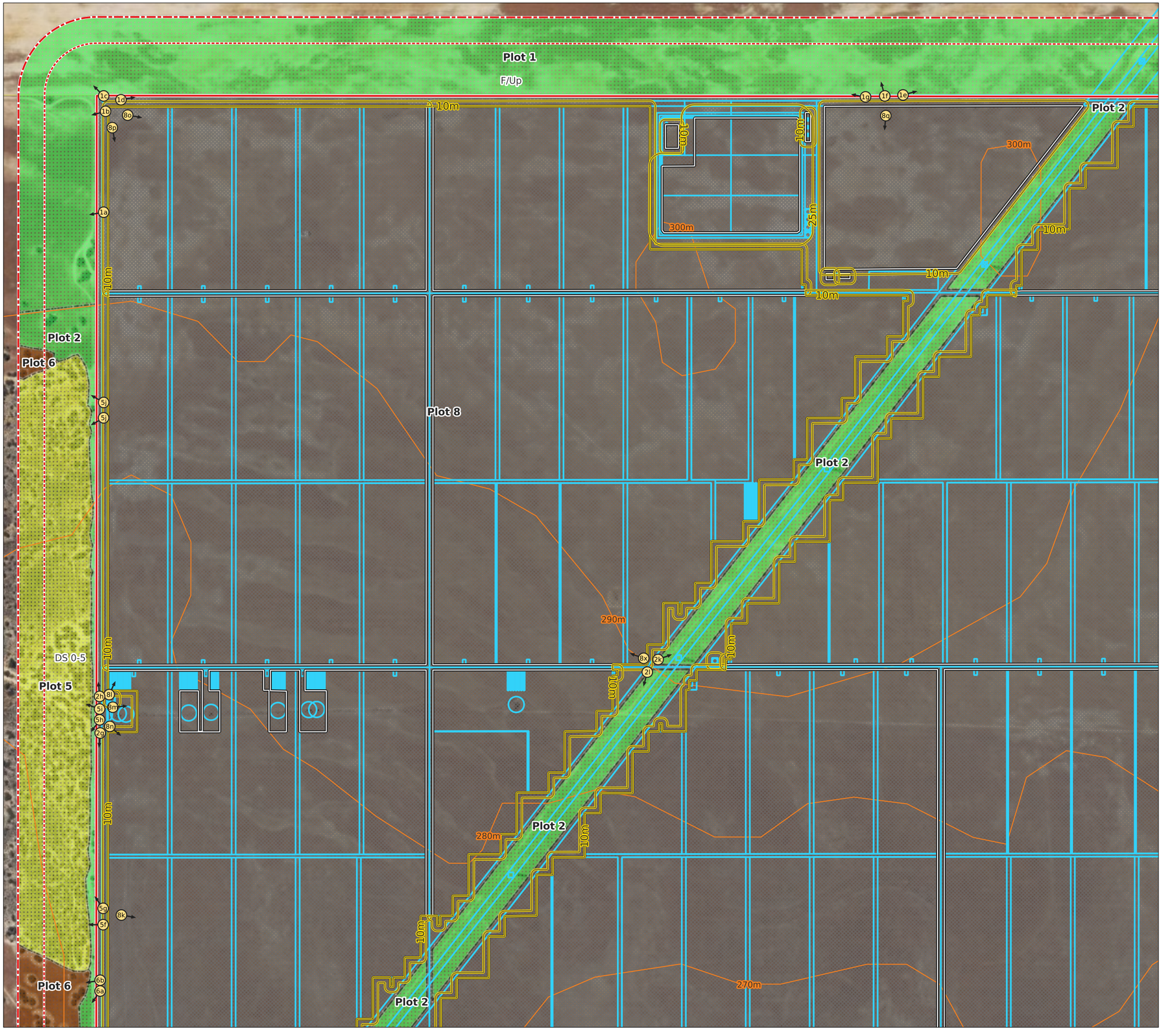
E linden@linfire.com.au

Trina Solar

Tathra Solar and BESS Facility

Post-development Vegetation and Effective Slope (East)

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Legend

- Photo Location
- Contours
- Building Outline
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot
- Asset Protection Zone

Classified Vegetation

- B. Woodland
- D. Scrub
- G. Grassland
- Modified to non vegetated and low threat

Scale 1:6,700

0 100 200 300 Metres

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Legend

- Photo Location
- Contours
- Building Outline
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot
- Asset Protection Zone

Classified Vegetation

- B. Woodland
- C. Shrubland
- D. Scrub
- G. Grassland
- Modified to non vegetated and low threat

Scale 1:6,700

0 100 200 300 Metres

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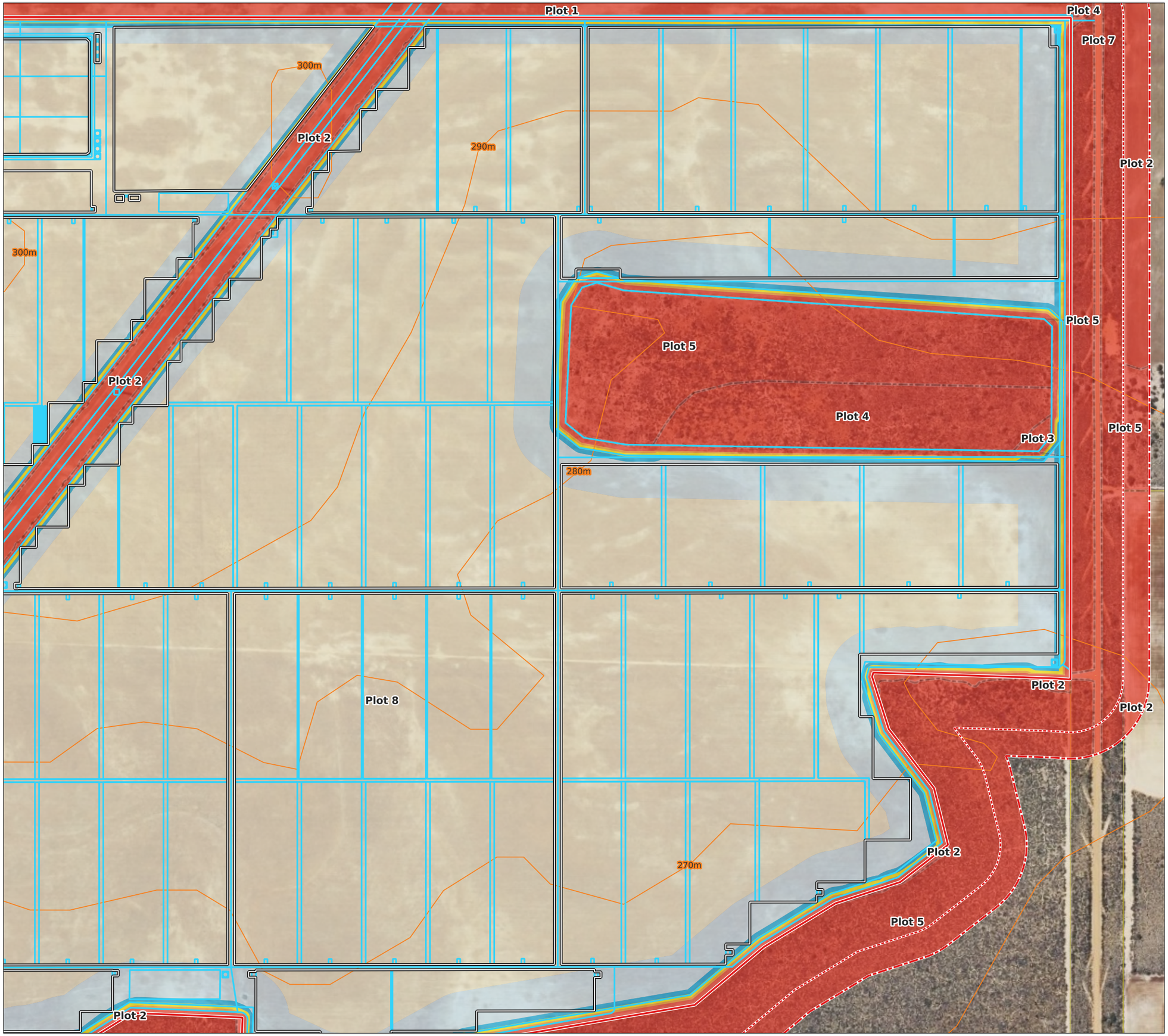
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Appendix 3 Additional BAL Contour Maps



Legend

- Contours
- Building Outline
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot

BAL Contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low

Scale 1:6,700

0 100 200 300 Metres

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BAL Contour Plan (East)

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Legend

- Contours
- Building Outline
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot

BAL Contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low

Scale 1:6,700

0 100 200 300 Metres

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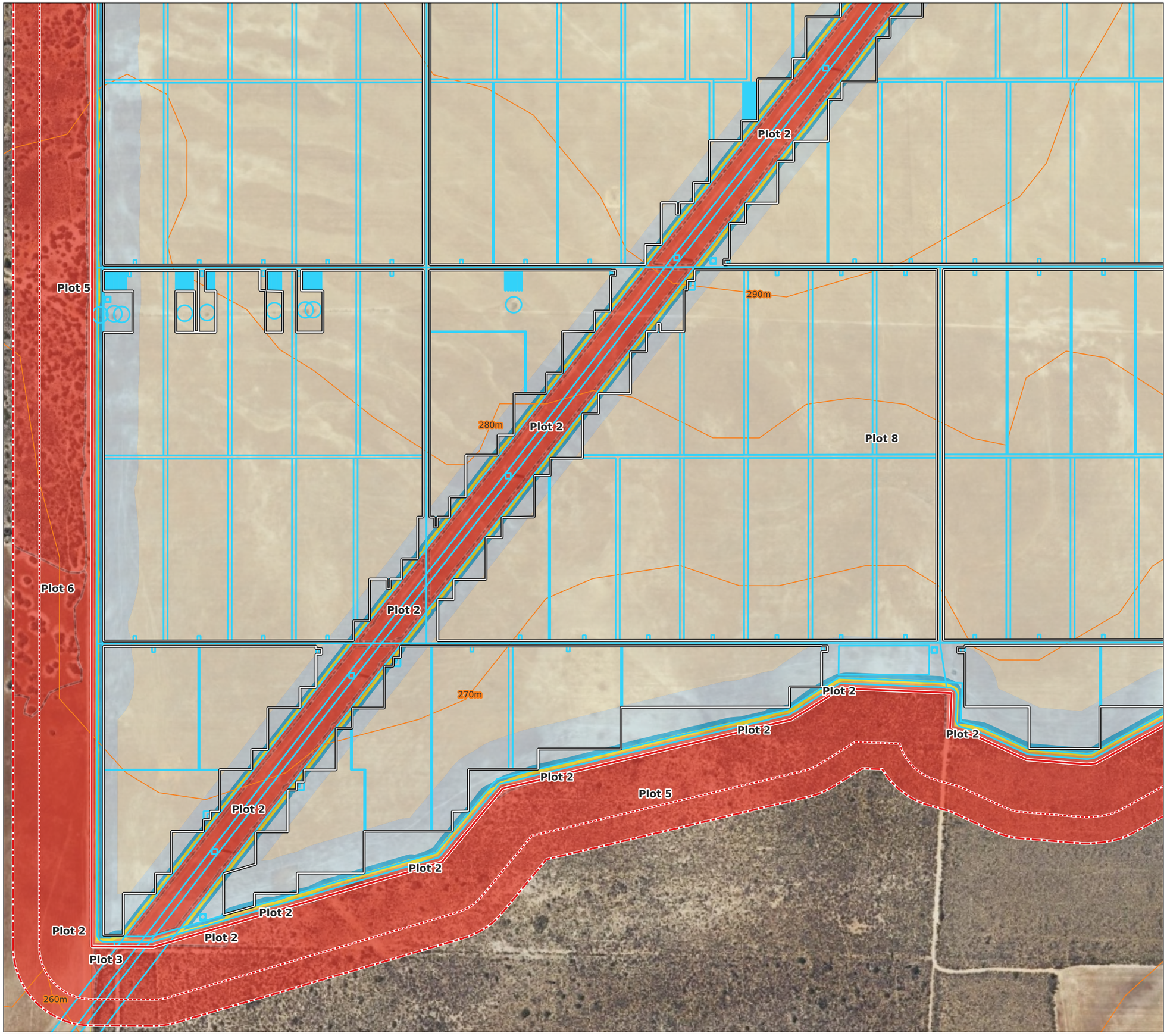
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BAL Contour Plan (North-West)

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Legend

- Contours
- Building Outline
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot

BAL Contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low

Scale 1:6,700

0 100 200 300 Metres

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Appendix 4 APZ standards (from Bushfire Guidelines)

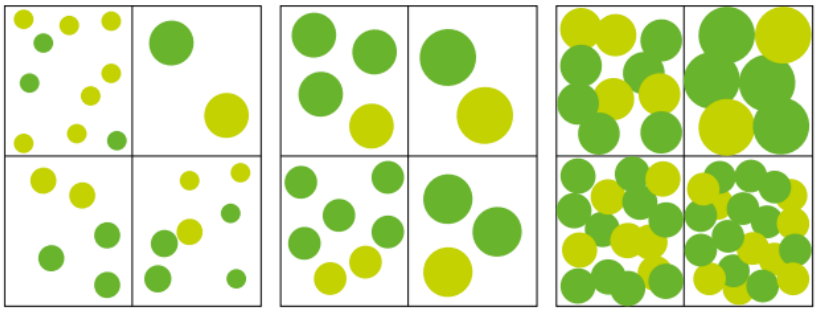
An APZ is a low fuel area maintained around a habitable building to increase the likelihood that it will survive a bushfire, by providing a defendable space and reducing the potential for direct flame contact, radiant heat exposure and ember attack. The APZ allows emergency services access and provides an area for firefighters and home-owners to defend their property.

An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed space that considers how existing and future mature vegetation, and combustible and non-combustible features interact with and affect the building's resilience to bushfire.

Vegetation management within an APZ should provide defendable space and be maintained to a low threat state, in perpetuity, in accordance with the requirements outlined below.

Table 9: Asset Protection Zone Technical Requirements

- **Trees* (> 6 metres in height)**
  - Trunks at maturity should be a minimum distance of six metres from all elevations of the building.
  - Branches at maturity should not touch or overhang a building or powerline.
  - Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation.
  - Canopy cover within the APZ should be <15 per cent of the total APZ area.
  - Tree canopies at maturity should be at least 5 metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ.



- **Shrub* and Scrub* (0.5 metres to 6 metres in height)**
  - Should not be located under trees or within three metres of buildings.
  - Should not be planted in clumps >5 square metres in area.
  - Clumps should be separated from each other and any exposed window or door by at least 10 metres.
  - Shrub and scrub >6 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height)**
  - Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load'.
  - Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
  - Ground covers >0.5 metres in height are to be treated as shrubs
- **Grass**
  - Grass should be maintained at a height of 100 millimetres or less, at all times.
  - Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
- **Fine Fuel load (combustible dead vegetation mater <6 mm in thickness)****

Table 9: Asset Protection Zone Technical Requirements

- Should be managed and removed on a regular basis to be maintained as low threat vegetation.
- Should be maintained at <2 tonnes per hectare (on average).
- Mulches should be non-combustible such as stone, gravel, shells, rock or crushed mineral earth or wood mulch >5 millimetres in thickness.

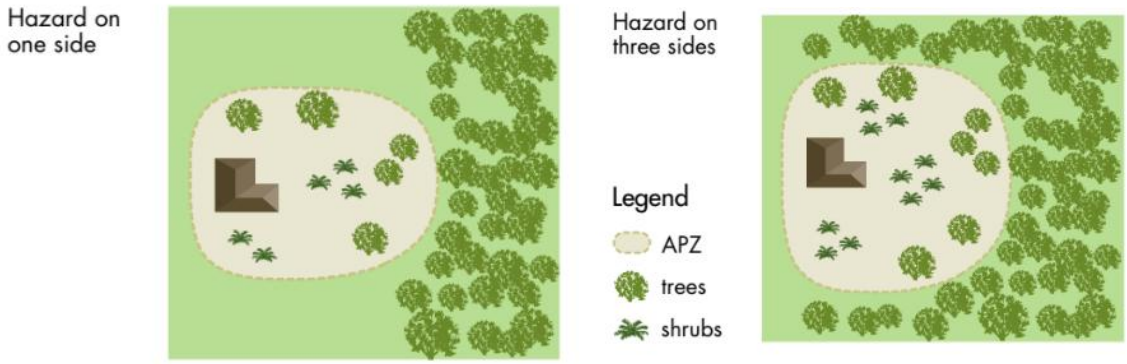
- **Defendable Space**
  - Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
- **Fences within the APZ**
  - Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959)
- **LPG Cylinders**
  - Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building.
  - The pressure relief valve should point away from the house.
  - No flammable material within six metres from the front of the valve.
  - Must sit on a firm, level and non-combustible base and be secured to a solid structure.

** Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes*

*** Fine fuel load:*

- *is the combustible, dead or dry vegetation matter on the ground, near ground, or elevated. Fine fuel includes grass, leaves, bark and twigs less than six millimetres in diameter that ignite readily and are burnt rapidly when dry.*
- *Fine fuel should be maintained at less than 2t/ha (100gm/m^2 equates to 1t/ha).*
  - *To estimate a fuel load (in t/ha), collect the dry fine fuel from a representative one square meter and weigh (in grams using kitchen scales) and multiply the weight by 0.01.*

Figure 25: Design of an Asset Protection Zone



B.2.2 Designing an Asset Protection Zone

An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed space that considers how existing and future mature vegetation, and combustible and non-

combustible features interact with and affect the building's resilience to bushfire.

An APZ should provide the greatest level of vegetation management within at least three metres of a habitable building, to ensure adequate unobstructed defendable space for emergency services to operate. This area should contain minimal vegetation and be free of combustible materials and obstructions. Within the remainder of the APZ, planting of vegetation can increase as you move farther away from the building.

The placement of plants within an APZ is a key design technique. Separation of garden beds with areas of low fuel or non-combustible material will break up fuel continuity and reduce the likelihood of vegetation within an APZ supporting a bushfire. It is important to consider the plant density and final structure and form of plants in their mature state.

Strategic landscaping measures can be applied, such as replacing weeds with low flammability vegetation to create horizontal and vertical separations between the retained vegetation.

Mulches used within the APZ should be non-combustible. The use of stone, gravel, shells, rock and crushed mineral earth is encouraged. Very fine or light mulch (such as shredded pine bark, pine needles, or poplar woodchips) less than five millimeters in diameter should be avoided. It is recommended that wood mulch is used in garden beds or areas where the moisture level is higher by regular irrigation, and these areas are separated with non-combustible elements, such as pathways and open spaces.

Incorporation of landscaping features, such as masonry feature walls, can provide habitable buildings with barriers to wind, radiant heat and embers. These features can include noise walls or wind breaks. Use of Appendix F of AS 3959 for bushfire resistant timber selection or the use of non-combustible fencing materials such as iron, brick, limestone, metal post and wire is encouraged within an APZ

B2.3 Management of an Asset Protection Zone

Ongoing maintenance of an APZ is usually enforced through a condition of a development approval, which should refer to Table 9 APZ technical requirements within this Appendix.

In addition to regular maintenance of an APZ, further bushfire protection can be provided by:

- ensuring gutters are free from vegetation
- installing gutter guards or plugs
- regular cleaning of underfloor spaces, or enclosing them to prevent gaps
- trimming and removing dead plants or leaf litter
- pruning climbing vegetation (such as vines) on a trellis, to ensure it does not connect to a building, particularly near windows and doors
- removing vegetation in close proximity to a water tank to ensure it is not touching the sides of a tank
- following the requirements of the relevant local government firebreak notice, which may include additional provisions such as locating wood piles more than 10 metres from a building.

Preparation of a property prior to the bushfire season and/or in anticipation of a bushfire is beneficial even if your plan is to evacuate. Embers can travel up to several kilometres from a bushfire and fall into small spaces and crevices or land against the external walls of a building.

Best practice recommends objects within the APZ are moved away from the building prior to any bushfire event.

Objects may include, but are not limited to:

- door mats
- outdoor furniture
- potted plants
- shade sails or umbrellas
- plastic garbage bins
- firewood stacks
- flammable sculptures
- playground equipment and children's toys.

B2.4 Plant Flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- **Fire resistant** – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- **Fire-retardant** – plants that can absorb more of the heat of the approaching bushfire without burning, compared to more flammable plants.
- **Fire wise** – plants that have been identified and selected based on their low flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire-retardant plant species that suit the environmental characteristics of an area.

When developing a recommended plant species list, local governments should consult with ecologists, land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.

Appendix 5 Low Threat Vegetation (AS 3959 Clause 2.2.3.2)

2.2.3.2 *Exclusions—Low threat vegetation and non-vegetated areas*

The following vegetation shall be excluded from a BAL assessment:

(a) Vegetation of any type that is more than 100 m from the site.

(b) Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified vegetation.

(c) Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other or of other areas of vegetation being classified vegetation.

(d) Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified vegetation.

(e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.

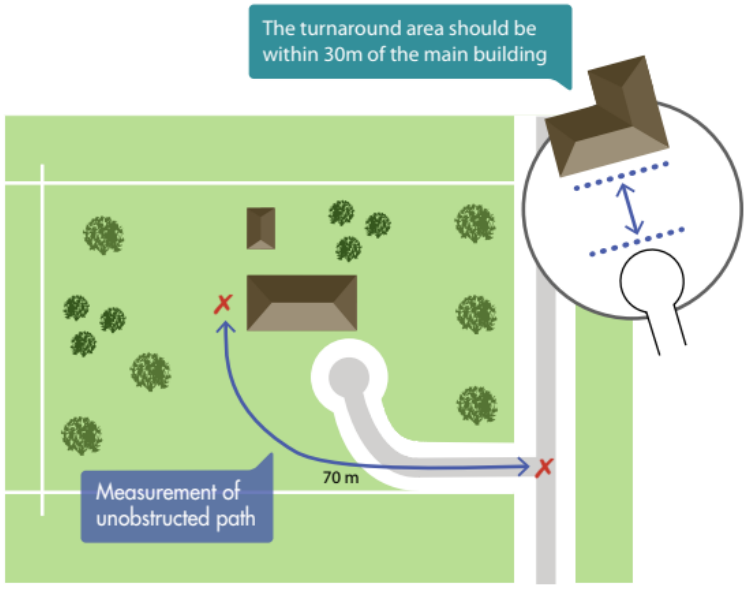
(f) Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.

NOTES:

1 Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm).

2 A windbreak is considered a single row of trees used as a screen or to reduce the effect of wind on the leeward side of the trees.

Appendix 6 Vehicular access technical standards of the Guidelines

Private driveways
Acceptable Solution A3.1
There are no private driveway technical requirements (prescribed by these Guidelines) where the private driveway is within a lot serviced by reticulated water and is no greater than 70 metres in length between the most distant external part of the habitable building and the public road. In circumstances where the above conditions are not met, the private driveway is to meet all of the following requirements: • requirements in Appendix B.3 Table 10, Column 5; and • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional carriageway width of 2 metres • (i.e. the combined carriageway width of the passing bay and constructed private driveway to be a minimum 6 metres); and • turn-around area (Figure 30) and within 30 metres of the habitable building (Figure 38).
Explanatory note B3.8
Emergency services vehicles typically operate from the street frontage in areas serviced by reticulated water and where the distance from the public road to the farthest part of the habitable building is no greater than 70 metres. In the event the habitable building cannot be reached by hose reel from the public road, emergency services vehicles will need to gain access via the driveway to the property. Emergency services vehicles will also need to gain access to the property where access to water is provided by onsite water tanks. In these situations, the driveway and battle-axe access leg (if applicable) will need to be wide enough for access by an emergency services vehicle and a vehicle to evacuate. It is acceptable for a private driveway to have a carriageway width of four metres with a traversable verge of one metre on either side of the carriageway. Turn-around areas (**Figure 38**) should be available for conventional two-wheel drive vehicles and type 3.4 fire appliances and should be located within 30 metres of habitable buildings. Circular and loop driveway design may also be considered. Figure 38: Design requirements for a private driveway where required 

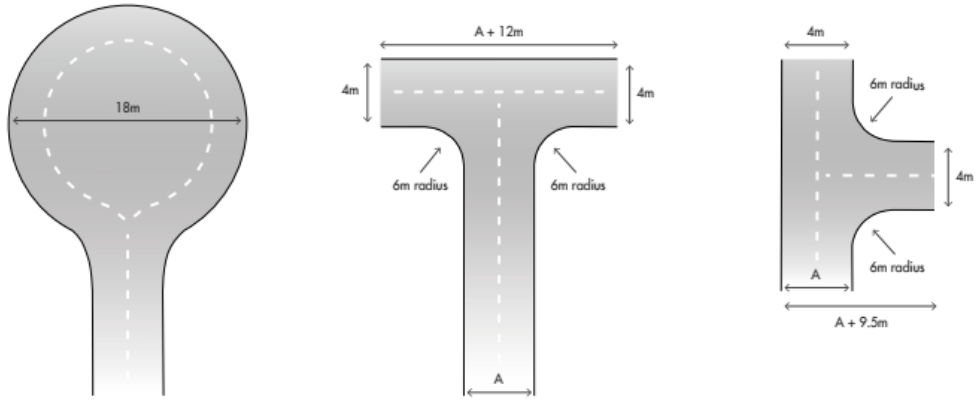
Private driveways
Figure 30: Design requirements for a turn-around area 

Table 10: Vehicular access technical requirements

	1		2		3		4		5	
TECHNICAL REQUIREMENTS	**PERIMETER ROADS**		**PUBLIC ROADS**		**EMERGENCY ACCESS WAY[3]**		**FIRE SERVICE ACCESS ROUTE[3]**		**BATTLE-AXE & PRIVATE DRIVEWAYS[1]**	
MAP OF BUSH FIRE PRONE AREAS DESIGNATION	**Area 2**	**Area 1**	**Area 2**	**Area 1**	**Area 2**	**Area 1**	**Area 2**	**Area 1**	**Area 2**	**Area 1**
Minimum horizontal clearance (metres)	12	8	See note 5		10	6	10	6	6	
Minimum vertical clearance (metres)	4.5									
Minimum weight capacity (tonnes)	15									
Maximum grade unsealed road[2]	See note 5		See note 5		1:10 (10% or 6°)					
Maximum grade sealed road[2,4]					1:7 (14.3% or 8°)					
Maximum average grade sealed road					1:10 (10% or 6°)					
Minimum inner radius of road curves (metres)					8.5					

Notes:

[1] Driveways and battle-axe legs to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision where not required to comply with the widths in this Appendix or the Guidelines.

[2] Dips must have no more than a 1 in 8 (12.5% - 7.1 degrees) entry and exit angle.

[3] To have crossfalls between 3 per cent and 6 per cent.

[4] For sealed roads only the maximum grade of no more than 1 in 5 (20 per cent) (11.3 degrees) for no more than 50 metres is permissible, except for short constrictions to 3.5 metres for no more than 30 metres in length where an obstruction cannot be reasonably avoided or removed.

[5] As outlined in the Institute of **Public Works Engineering Australasia (IPWEA) subdivision guidelines, Liveable Neighbourhoods, Austroads Standards** Main Roads standard, supplement, policy or guideline and/or any applicable or relevant local government standard or policy.

Appendix 7 Water technical standards of the Guidelines

Appendix B.4 – Water Supply
B4.1 Construction and Design Technical requirements
• An above-ground tank and associated stand should be constructed of non-combustible material. • Below-ground tanks should have a 200 millimetres diameter access hole to allow tankers or emergency services vehicles to refill direct from the tank, with the outlet location clearly marked on the surface. • Above and below ground tanks may need to comply with AS/NZS 3500.1:2018. • An inspection opening may double as the access hole provided that the inspection opening meets the requirements of AS/NZS 3500.1:2018. • Where an outlet for an emergency services vehicle is provided, then an unobstructed, hardened ground surface is to be supplied within four metres of any water supply. B4.1.1 Pipes and Fittings All above-ground, exposed water supply pipes and fittings should be metal. Fittings should be located away from the source of bushfire hazard and be in accordance with the applicable section below, unless otherwise specified by the local government. B4.1.2 Fittings for above-ground water tanks • Commercial land uses: 125mm Storz fitting; or • Strategic water tanks: 50mm or 100mm (where applicable and adapters are available) male camlock coupling with full flow valve; or • Standalone water tanks: 50mm male camlock coupling with full flow valve; or • Combined water tanks: 50mm male camlock coupling with full flow valve or a domestic fitting, being a standard household tap that enables an occupant to access the water supply with domestic hoses or buckets for extinguishing minor fires. B4.1.3 Remote outlets In certain circumstances, it may be beneficial to have the outlet located away from the water supply. In instances in which a remote outlet is to be used, the applicant should consult the local government and DFES on their proposal.
B4.2 Use of Water Supply
• The combination of drinking water and water for firefighting purposes is not recommended, as stagnant water may alter the quality of the drinking water and the emergency services, by law, may not be able to take water from the water supply to suppress a bushfire. • Combining drinking water and water for firefighting purposes is contrary to provisions within clause 4.2.3 of AS/ NZS 3500.1:2021
B4.3 Independent Water and Power Supply
• Water tank/s are to be provided in accordance with Table 11, Water supply dedicated for bushfire firefighting purposes.
B4.5 Location of Water Tanks and Hydrants
• Surrounding vegetation should be considered when locating a water tank. • Avoid locations where the tank will be situated underneath existing vegetation or where vegetation will grow against or overhang the tank, (Figure 39). Where a tank is on the bushfire hazard side of a building, sufficient shielding for the protection of firefighters should be provided. In addition to the tank location, the fitting should be positioned and/or shielded from the bushfire hazard to allow access by emergency services.

Figure 39: A good and bad example of landscaping around a water tank



Table 11: Water supply dedicated for bushfire firefighting purposes

SECTIONS FROM THE PLANNING FOR BUSHFIRE GUIDELINES					
SECTION 5[2] STRUCTURE PLANS AND SUBDIVISION APPLICATIONS		**SECTION 6[2] DEVELOPMENT – RESIDENTIAL**	**SECTION 7[2] DEVELOPMENT – COMMERCIAL & INDUSTRIAL**	**SECTION 8[2] – DEVELOPMENT – VULNERABLE LAND USES**	
One additional lot	10,000 litre water tank per lot	10,000 litre water tank per habitable building	For each habitable building - 10,000 litre per 1,500 m² of floor space up to 50,000 litre. Provided in a water tank	Camping ground	At the discretion of the local government
Three to 24 lots	10,000 litre water tank per lot[1] **or** 50,000 litre strategic water tank				
25 lots or more	50,000 litre per 25 lots or part thereof, provided as a strategic water tank(s) **and/or** 10,000 litre water tank per lot			Other vulnerable land uses	For each habitable building - 10,000 litre per 500 m² of floor space up to 50,000 litre. Provided in a water tank

Notes:

[1] Evidence that the identified water supply amounts in either column denoted is to be provided at the relevant planning stage.

[2] where more than one habitable building is proposed, strategic water tanks are to be provided in accordance with Section 5 requirements and at the discretion of the Local Government.

Appendix 8 Shire of Three Springs Firebreak Notice

Bush Fire Brigade Fire Control Officers

Three Springs Town
Rod Ennor (Captain) 0458 246 531

Three Springs East
Christian Haeusler (Captain) 0429 954 506

Arrino
Ash Bone (Captain) 0427 477 228

Three Springs West
Jim Heal (Captain) (08) 9955 2022 0429 165 235

Tree plantations of more than 3 hectares but less than 10 hectares

Construct a 10m wide mineral earth firebreak with a vertical clearance of 4m high; clear of all inflammable material immediately surrounding the plantation (adjacent areas of the same property subject to provisions as for rural land)

Plantations larger than 10 hectares

Must comply with the Code of Practise for Timber Plantations in the Western Australia Guideline for Plantation Fire Protection, A copy is available from the Shire of Three Springs upon request

PERMITS

Chief Bush Fire Control Officer
Craig Morgan (08) 9955 2001 0429 377 991
* Out of town permits only *

Deputy Chief Bush Fire Control Officer
Ash Bone 0427 477 228

Three Springs Shire Office
Keith Woodward (CEO) (08) 9954 1001
* All Three Springs Permits *

PENALTIES

Failure to maintain a firebreak as per firebreak order	$250
Offence relating to lighting a fire in the open air	$250
Setting fire to bush during prohibited burning period	$250
Failure of Occupier to extinguish a bushfire	$250
Refusal to state name and abode or stating a false name and abode	$100
Failure to produce permit to burn	$100

Fire Control Officers are not obliged to issue permits.
Permits cannot be issued over the phone and should a Fire Control Officer refuse to issue a permit, it is a breach of the Bush Fires Act 1954 to request a permit from another Fire Control Officer.
You MUST have a copy of the permit on you during the burn.

THREE SPRINGS SHIRE COUNCIL

Fire Break Notice
Section 33 B F A

Prohibited Burning Period

1st November to 28th February

STRICTLY NO BURNING

Restricted Burning Period

15th October to 31st October

1st March to 15th March

PERMITS ARE REQUIRED

000 EMERGENCY

FIRST AND FINAL notice is hereby served to all residents and ratepayers

Failure to install and maintain firebreaks in accordance with this notice may result in a $5,000 fine.

Harvesting Operations

No harvesting operations are permitted on **Christmas Day**, **Boxing Day** and **New Years Day**. A separate fire fighting fire appliance is required to be present in any paddock being harvested, chaining, raking stubble, straw baling and associated allied activities during restricted and prohibited periods. The fire fighting unit must be in a state of readiness and have a minimum capacity of 400 litres of water, a powered pump and at least 15 metres of hose with a minimum diameter of 19 mm and capable of delivering water though an adjustable nozzle is to be readily available to any paddock being harvested. All vehicles or machinery operating in a paddock during Restricted or Prohibited burning times must have a Fire Extinguisher as defined in the Act. A Fire Extinguisher means a device which comprises– a. a container filled with at least 7.5 litres of water and a pump capable of discharging that water, and which is in a sound and efficient condition.

A Harvesting and Movement Ban and Use of Internal Combustion Engines (except for the watering and movement of stock) will be imposed when the actual weather conditions reach a Fire Danger rating of thirty five (35). All such bans are at the discretion of the Chief Bush Fire Control Officer or a duly appointed person

HARVEST BAN INFORMATION

Any person may register for the SMS notification service. Please note, this service does include Road Closures and other important information form time to time. To register ,email general@threesprings.wa.gov.au or phone 08 9954 1001.

If a ban has been imposed, all persons registered will be sent a text message advising of details. All bans will still be broadcast on radio ABC State wide AM

Note – Attention of landowners is drawn to the fact that this order allows for provision of firebreaks in situations other than immediately with property boundaries subject to approval. The Chief Bush Fire Control Officer and appointed Fire Control Officers have been authorised to act for Council in this matter.

Failure to install and maintain firebreaks in accordance with this Notice may result in a $5,000 fine.

BUSH FIRES ACT 1954 AS AMENDED

Notice is hereby given to all landowners/occupiers within the Shire of Three Springs that fire-breaks must be installed on or by 1st October and maintained of flammable material up to and including 15th March as per requirements in relation to Section 33 of the above

PROPERTIES WILL BE INSPECTED TO ENSURE THEY COMPLY WITH COUNCILS REQUIREMENTS

1. TOWNSITES

On or before 1st October all town lots within the town sites of Three Springs and Arrino are required to be treated as follows. Where the area of land is less than 3,000m², the property must be cleared, mowed, slashed to a MAXIMUM height of 7.5 cm of all flammable material.

Where the area of the land is 3,000m² or more, a firebreak must be provided not less than 3 metres in width inside and along the whole of the external boundaries of the properties owned or occupied and all flammable material must be cleared a distance of 2.7m from all buildings and/or haystacks situated on the land and maintained free of such material until the 15th March.

FUEL STORAGE AREAS

On or before the 1st October all grass and similar material is to be cleared from such places where drum ramps are located and where drums, empty or full, are stored and such areas to be maintained cleared of grass and similar flammable material until 15th March

FARM BUILDINGS AND UNATTENDED ELECTRIC MOTORS AND HAY STACKS

Fire breaks at least 3 metres in width completely surrounding and not more than 20 metres from the perimeter of any building, group of buildings or haystacks, All flammable material must be removed from an area 2.7 metres in width immediately surrounding the building. All flammable material must be removed from an area 3 metres in width immediately surrounding an unattended electric motor site

UNATTENDED FUEL OPERATED MOTORS

All flammable material must be removed from an area 3 metres in width immediately surrounding an unattended fuel operated motor whether the motor is intended to be used or not.

RURAL LAND

Firebreaks must be provided not less than 3 meters in width inside and along the whole of the external boundaries of the properties owned or occupied: where this is not practicable the firebreaks must be provided as near as possible to, and within, such boundaries

BARBEQUES AND INCINERATORS

Gas and electric barbeques are permitted any time. Solid fuel barbeques and incinerators are PROHIBITED on days of VERY HIGH FIRE DANGER or above .

PENALTY

The penalty for failing to comply with this notice is a fine of up to $400 and a person in default is also liable, whether prosecuted or not, to pay the cost of performing the work in this notice, if it is not carried out by the owner or Occupier by the date required by this notice



Appendix 9 Emergency Management Plan - Bushfire Requirements

The Proponent is to develop an emergency management plan for the facility, which comprehensively details the procedures for preparing for, and responding to, hazards to the facility, including the following for off-site bushfire, and on-site fire, emergencies:

- Facility details including:
  - Facility description, including infrastructure details, operations, number of personnel, and operating hours.
  - Up-to-date contact details for facility personnel, and any relevant off-site personnel that could provide technical support during an emergency including contact information for 24/7/365 specialist technical support for the renewable energy infrastructure.
  - Site plans that depict the entire site layout, including:
    - Buildings, substations and renewable energy infrastructure (including BESS units),
    - Internal roads and surrounding public roads
    - Fire protection systems and equipment, including firewater tanks
    - Grid connections, drains and isolation valves,
    - Dangerous goods storage areas
    - Neighbours and
    - North direction and scale
  - The following BESS details and plans
    - Schematics and technical data for BESS units, the number of units on-site, and the number of battery racks or modules within each unit.
    - Details of the hazards for the BESS, including thermal events/runaway, electrical safety hazards, explosion hazards, dangerous goods hazards (including off-gassing), and the effects of fire on the BESS (e.g. explosion, release of toxic gases).
    - Details of all provided battery failure/safety and protective systems, including a description, the activation process/automatic trigger, and any hazards associated with these systems.
    - Specifications for safe operating conditions for temperature.
    - Details of the elements monitored/controlled by the Battery Management System (BMS), including internal temperature, state of charge, voltage, etc. and the locations this information is available.
    - The shutdown and/or isolation procedures if the BESS are involved in fire or emergency incident, and appropriate personnel contact details for verifying that the battery enclosure/container system has been isolated/shutdown and de-energised during emergencies.
  - Details of any emergency resources, including fire detection and suppression systems and equipment; emergency eye-wash and shower facilities; spill containment systems and equipment; emergency warning systems; communication systems; personal protective equipment; first aid.
  - A manifest of dangerous goods (if required under the applicable Dangerous Goods legislation and codes, and relevant Australian Standards), including Safety Data Sheets (SDS).
- The identified risks and hazards associated with the renewable energy infrastructure, including but not limited to:
  - Bushfire

  - Electrical faults and renewable energy infrastructure fire (including BESS fire)
- Detail preparedness and pre-emptive actions to address the above hazards, including the following for bushfire:
  - Ongoing compliance with the approved BMP and BRMP, including ensuring regular vegetation management requirements are achieved, vehicular access routes and firewater systems are maintained and available, and conducting regular bushfire housekeeping inspections.
  - Ensuring ongoing maintenance of all buildings, especially the onsite O&M building.
  - Ensuring ongoing maintenance of all fire and communication systems.
  - Determining forecast Fire Danger Rating (FDR), Total Fire Bans (TFB) and Harvest Vehicle Movement Bans (HVMB), during bushfire season
  - Modifying Site Activities (based on Forecast FDR and TFB/HVMB)
  - Monitoring DFES Bushfire Emergency Warnings for bushfire (and/or other signs of bushfire activity) within 50 km of the facility, during bushfire season, and understanding the decision-making triggers.
- Detail emergency response procedures to address the nominated hazards, including for:
  - Bushfire and
  - Onsite fire in renewable energy infrastructure
  - Management of firewater runoff

Bushfire preparedness and pre-emptive activities

Year-round (with focus on the month prior to bushfire season)

- Ensure ongoing compliance with endorsed BMP including:
  - Vegetation management must be conducted as per the BMP including maintenance of NVZs and APZs.
  - Gutters, roof surfaces and valleys, kerbs, traps, sumps, bunds, drains, rooves or any other accumulation points for leaf litter, dry vegetation, or any other combustible materials must be cleared, and the debris removed from site.
  - Extraneous or unnecessary materials (fuel loads) must be removed from site (e.g. dilapidated/stored vehicles, plant or equipment; excess fuel/chemicals; any combustible waste materials).
- Bushfire preparedness housekeeping inspections:
  - Vegetation management as per BMP
  - Ensure all vehicle site access points, including emergency access points, are clear and accessible.
  - Ensure that all fire protection systems and equipment is unobstructed, in service and performing optimally.
- Fire detection, alarm and suppression systems, and any other communication and emergency equipment must be maintained in accordance with relevant codes and standards, and be in effective working order at all times
  - Any defects, faults or matters affecting the performance of systems must be identified through routine testing and servicing, with any maintenance activities and rectifications to be closed-out prior to bushfire season.
- Ensure Emergency Information Book and signage is up to date with the latest information, especially key contact names and phone numbers, as detailed in Section 5.6.
- Ensure local fire brigade is engaged with on an ongoing basis, to ensure they are familiar with

the site layout, specific hazards and fire detection and suppression systems as detailed in Section 0.

- Ensure the facility has registered with the Shire of Three Springs for SMS notifications for Harvest Vehicle Movement Bans (HVMB).

During the bushfire season

Monitor Forecast Fire Danger Rating (FDR) and Total Fire Ban Days (TFB)

- A nominated person/role is to be responsible for identifying, responding to and communicating the Fire Danger Rating, ideally four days ahead:
  - http://www.bom.gov.au/wa/forecasts/fire-danger-ratings.shtml [4 day FDR forecast] or
  - https://www.emergency.wa.gov.au/index.html#firedangerratings [current/next day FDR]
  - https://www.emergency.wa.gov.au/#totalfirebans [Total Fire Ban]
- This information must be communicated to everyone likely to be present on-site, and relevant off-site personnel.
- Undertaken any modification of site activities based on forecast FDR or TFB (see below).

Modifying Site Activities (based on Forecast FDR and TFB)

- ***Moderate FDR or No Rating***
  - No specific daily monitoring or actions unless conditions change.
- ***High FDR***
  - Alert all site personnel and visitors of bushfire risk
  - No specific daily monitoring but remain vigilant to potential bushfires through visual checks, occasional check of online resources for emergency warnings and bushfires in the local area.
  - Conduct daily checks of vegetation, rubbish and extraneous storage accumulation, vehicular access routes and fire and communication systems, to ensure they are fit-for-purpose in a bushfire emergency.
- ***Extreme FDR***
  - Alert all site personnel and visitors of elevated bushfire risk and communicate modified activities including requirement to be prepared for site shutdown and offsite evacuation, if required.
  - Conduct regularly visual checks throughout the day
  - Regularly check online resources for emergency warnings and bushfires in the local area.
  - Consider minimisation of site personnel and visitation requiring travel to and from the facility, as well as non-essential activities and high-risk maintenance activities.
  - Include bushfire ignition hazards in any Job Hazard Analysis or similar activity-based risk management process for site activities.
  - Conduct daily checks of vegetation, rubbish and extraneous storage accumulation, vehicular access routes and fire and communication systems, to ensure they are fit-for-purpose in a bushfire emergency.
- ***Catastrophic FDR and TFB declared days***
  - Alert all site personnel and visitors of elevated bushfire risk and communicate modified activities including requirement to be prepared for rapid site shutdown and offsite evacuation, if required
  - Conduct hourly visual checks throughout the day
  - Conduct hourly check online resources for emergency warnings and bushfires in the local area.

- Postpone non-essential activities or high-risk maintenance activities at the facility.
- Minimise site personnel and visitation to only essential personnel.
- Include bushfire ignition hazards in any Job Hazard Analysis or similar activity-based risk management process for site activities.
- Conduct daily checks of vegetation, rubbish and extraneous storage accumulation, vehicular access routes, and fire and communication systems, to ensure they are fit-for-purpose in a bushfire emergency.
- Comply with all Total Fire Ban requirements including:
  - No fire or flames allowed in the open air
  - No open fires for the purpose of cooking or camping are not allowed
  - No 'hot work' such as metal work, grinding, welding, soldering, gas cutting or similar is allowed unless a formal exemption has been obtained
  - No use of chainsaws, plant or grass trimmers or lawn mowers in bushland areas
  - No other activities that may start a fire
  - Ensuring equipment or machinery is mechanically sound
  - Ensuring all reasonable precautions are taken to prevent a bushfire igniting, including postponing any activity that could result in a bushfire ignition.

Monitoring and Modifying Site Activities (based on HVMB)

- Nominated personnel are to monitor for SMS warnings from Shire of Three Springs for declared Harvest Vehicle Movement Bans (HVMB).
- If declared, comply with all HVMB requirements of the Shire, which typically including no:
  - Operation or movement of internal combustion engines (motor bikes, quad bikes, excavators, chain saws, ride on mowers, generators, plant equipment) used off-road in bushland or paddocks.
  - Undertaking 'hot works' such as welding, grinding or activity that may cause a spark or ignition unless an exemption issued by Department of Fire & Emergency Service (DFES) for essential services work on a total fire ban day.
  - Fire or flames allowed in the open air
  - Cooking outside in the open air using an open fire (this includes under verandas and patios)
  - Harvesting

Bushfire Monitoring, Triggers and Decision-Making

Bushfire Monitoring

Bushfire monitoring involves the identification of the DFES Bushfire Emergency Warnings (ADVICE, WATCH & ACT AND EMERGENCY) and/or bushfire activity within 50km of the facility, through the use of the Emergency WA website app (https://www.emergency.wa.gov.au/), or ABC local radio.

- ***If ADVICE warning or bushfire is within 25 km – 50 km of the site***
  - If possible, liaise with the DFES if fire travelling toward the site.
  - Consider reducing numbers of onsite personnel to essential staff only, and relocate all other staff and visitors to nominated offsite safer location (e.g. Eneabba, Three Springs or Carnamah townsites depending on direction of fire travel).
  - Make preparations to shutdown facility and conduct offsite evacuation procedures, depending on bushfire location and direction of spread, including:
    - Reducing the facility to a low energy state (including discharging the BESS), in

consultation with authorised DFES personnel (where possible)
    - Ensure onsite O&M building is properly prepared for onsite shelter, should it be required (NOTE: The O&M building is not a bushfire refuge building and should only be used as a last resort if offsite evacuation is not possible).
    - Ensure all other buildings and plant are properly secured.
    - Ensure all vehicular access routes are open and available for use.
    - Ensure all fire and communications systems are ready for use.
  - Continue monitoring and re-evaluating situation depending on bushfire behaviour, and liaising with DFES as required.
- ***If WATCH & ACT warning or bushfire is within 10 km – 25 km of the site***
  - If possible, liaise with the DFES if fire travelling toward the site.
  - Prepare or commence shutdown facility, depending on bushfire location and direction of spread, including:
    - Reducing the facility to a low energy state (including discharging the BESS), in consultation with authorised DFES personnel (where possible)
    - Ensure onsite O&M building is properly prepared for onsite shelter, should it be required (NOTE: The O&M building is not a bushfire refuge building and should only be used as a last resort if offsite evacuation is not possible).
    - Ensure all other buildings and plant are properly secured.
    - Ensure all vehicular access routes are open and available for use.
    - Ensure all fire and communications systems are ready for use.
  - Prepare or commence offsite evacuation procedures depending on bushfire location and direction of spread, including:
    - Early reduction of numbers of onsite personnel to essential staff only, and relocate all other staff and visitors to nominated offsite safer location, if safe to do so, otherwise they are to remain onsite at the O&M building.
    - If possible, ensure relocation of all personnel to the offsite safer location ahead of any bushfire impact on road network (including smoke impact).
  - Continue monitoring and re-evaluating situation depending on bushfire behaviour, and liaising with DFES as required.
- ***If EMERGENCY warning or if bushfire is <10km or impact is imminent:***
  - If possible, liaise with the DFES.
  - If safe to do so, commence or conduct facility shutdown depending on bushfire location and direction of spread, ideally in consultation with authorised DFES personnel (where possible), including:
    - Reducing the facility to a low energy state (including discharging the BESS)
    - Ensure onsite O&M building is properly prepared for onsite shelter, should it be required (NOTE: The O&M building is not a bushfire refuge building and should only be used as a last resort if offsite evacuation is not possible).
    - Ensure all other buildings and plant are properly secured.
    - Ensure all vehicular access routes are open and available for use.
    - Ensure all fire and communications systems are ready for use.
  - Urgently undertake offsite evacuation procedures (if safe to do so) depending on bushfire location and direction of spread, including:
    - Relocate all site personnel and visitors to nominated offsite safer location ahead of any bushfire impact on road network.
  - If unsafe to evacuate offsite, urgently commence onsite shelter in place procedures

including:

- Prepare onsite O&M building for onsite shelter
- Relocate all site personnel and visitors to the O&M building on conduct all shelter in place actions.

- Continue monitoring and re-evaluating situation depending on bushfire behaviour, and liaising with DFES as required.

Offsite Evacuation and Onsite Shelter-in-Place Procedures

Ahead of deciding to evacuate offsite or remain onsite to shelter-in-place (which is the last resort response if unsafe to evacuate offsite), the following should be conducted:

- Assess the bushfire situation:
  - Review available information to determine bushfire location, direction and speed of travel
  - Determine if there are any DFES Bushfire Warnings issued
  - Contact and liaise with DFES for further information and guidance
  - Make a decision whether it is safe to evacuate to nominated offsite safer location (e.g. Eneabba, Three Springs or Carnamah townsites depending on direction of fire travel), or whether it is safer to shelter onsite in the O&M building (which should be a last resort action only).
  - Advise DFES of the decision, if possible.

Offsite Evacuation (and Facility Shutdown)

- Assemble all site personnel and visitors at the O&M building
  - Brief them of the bushfire situation and the plan to shutdown facility (if sufficient time) and evacuate to nominated offsite safer location.
  - Ensure sufficient transport is available for all personnel to travel to nominated offsite safer location with sufficient fuel to travel 100 km, water, fire extinguishers (if possible)
- Conduct facility shutdown actions (if sufficient time) including
  - Reducing the facility to a low energy state (including discharging the BESS)
  - Ensure all vehicular access routes are open and available for use.
  - Ensure all fire systems are ready for use.
  - Ensure all other buildings and plant are properly secured.
- Brief evacuees on offsite evacuation particulars including:
  - Confirm the offsite safer location (e.g. Eneabba, Three Springs or Carnamah townsites depending on direction of fire travel)
  - The evacuation route to travel to the off-site safer location
  - The need to travel in convoys in case of vehicle failure
  - Ensure final evacuating personnel are in no less than 2 vehicles.
- Monitor the leaving of site and arrival at nominated offsite safer location, and if anyone is missing, notify DFES immediately.

Onsite Shelter-in-place (and Facility Shutdown) – Last Resort Action Only

- Assemble all site personnel and visitors at the onsite O&M building
  - Brief them of the bushfire situation and the plan to shutdown facility (if sufficient time) but remain onsite to shelter in place.
- Prepare onsite O&M building for shelter (NOTE: The O&M building is not a bushfire refuge building and should only be used as a last resort if offsite evacuation is not possible)

- Check the perimeter of building and put away all external combustible items and any loose items that could be projectiles
- Close all doors and windows
- Ensure all firefighting, emergency communication equipment and first aid supplies are available and ready for use, including hose reel coverage around the building (if any) from the mobile fire trailer.
- Ensure all internal access routes within the building are open to enable people move to the available spaces
- If installed, ensure any evaporative air-conditioning (HVAC) can be easily shutdown ahead of the fire impact. If possible, keep the water running and turn off the fan, otherwise shutdown completely.
- Begin storing water for drinking (in containers) and review food stores
- Consider collecting any blankets and fire extinguishers from other buildings
- Soak towels and rugs in water and lay them along the inside of external doorways or block any other gaps for embers or smoke

- Conduct facility shutdown actions (if sufficient time and safe to do so) including
  - Reducing the facility to a low energy state (including discharging the BESS)
  - Ensure all vehicular access routes are open and available for use.
  - Ensure all fire systems are ready for use.
  - Ensure all other buildings and plant are properly secured.
- As bushfire impacts the facility:
  - All remaining occupants are to be within the O&M building
  - Immediately before the fire arrives, wet down building exterior, decks and landscaping close to the building. Turn off evaporative air-conditioning if not already done.
  - Ensure occupants to get down low to limit exposure to smoke and drink plenty of water to avoid becoming dehydrated.
  - Regularly inspect the condition of the building including:
    - Regular inspection of the inside of the building, including the roof space for sparks and embers, and extinguish where possible and safe to do so.
    - If safe to do so, organise for regular patrols of the outside of the building to check for any signs of bushfire ignition and extinguish where possible and safe to do so. Those conducting the patrols are to wear appropriate PPE.
- Stay inside while the fire front is passing and don't leave until advised by that the fire is no longer a threat or offsite evacuation can be conducted (or decided by Chief Fire Warden).
- If the building catches fire and/or conditions inside become unbearable:
  - Leave through the door furthest from the approaching fire
  - Relocate all occupants to the following locations furthest from the fire or previously burned land.
- Once the fire has passed, and approval is provided to leave the building:
  - Go outside and extinguish any fires on the building or in adjacent landscaping.
  - Regularly inspect the inside and outside of the building for several hours.
  - Do not approach the renewable energy infrastructure (especially BESS units) until advised by DFES.

Onsite Renewable Energy Infrastructure Fire Response

The emergency response to any onsite fire in renewable energy infrastructure (especially BESS), is to include the following:

- Immediately notify the following of onsite fire, including location:
  - DFES to enable rapid turnout to site
  - Relevant staff
  - Relevant neighbouring landowners
- Strongly consider full emergency shutdown of the BESS and substation unless there are mitigating circumstances. This should be conducted in consultation with authorised DFES personnel (where possible).
- If fire is within the BESS unit/s, ensure staff relocate as far as possible from the fire, and no less than 50 m away.
- If fire is not in the BESS (e.g. in solar farm), and it is safe to do so, trained personnel to conduct first attack response on any spot fires with mobile fire trailer, until DFES arrival.
- If possible, ensure relevant vehicular access routes are open and available, to enable attending firefighters to gain access to the location of the fire.
- Ensure all fire and communications systems are ready for use.
- If safe to do so, conduct first attack response on any spot fires with mobile fire trailer, until DFES arrival.
- Ensure attending firefighters have access to any relevant specialist technical personnel (onsite or offsite), to assist by providing technical advice.

Emergency Management Plan Review, Training and Exercises

The emergency management plan is to be reviewed regularly as follows:

- At least annually to ensure currency and effectiveness
- Following any changes to the risk on-site pertaining to site infrastructure and operations
- After any activation of the plan or incident involving notification to the emergency services.
- After emergency exercises.

In addition to the review of the emergency management plan, it is critical to regularly train relevant staff and conduct exercises to ensure everyone is fully conversant with the requirements of the plan and able to respond as required during all emergencies. It also presents an opportunity to test the effectiveness of the plan and refine as required.

- Training should be conducted annually prior to bushfire season, as a minimum, and also at the commencement of employment.
- Exercises should be conducted annually prior to bushfire season, as a minimum, but ideally on a regular basis.

Appendix I – Bushfire Risk Management Plan

Trina Solar – Tathra Solar and BESS Facility

Lot 10896 Turkey Flat Road, Kadathinni

Bushfire Risk Management Plan (Renewable Energy)

Date: 27 March 2025

Prepared For: SLR Consulting Pty Ltd

Linfire Ref: 20240919380SLR-BRMP-001_0

Linfire Consultancy

ABN: 577 930 47299

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

Revision	Issue Date	Revision Description	Approved By
0	27 Mar 2025	Issued for Review	Linden Wears (Level 3 BPAD 19809)

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Fire is an unpredictable force of nature. Changing climatic factors (whether predictable or otherwise) either before or at the time of a fire can also significantly affect the nature of a fire and in a bushfire prone area it is not possible to completely guard against bushfire. The mitigation strategies contained in this Bushfire Risk Management Plan (BRMP) are considered to be prudent minimum standards only, based on the standards prescribed by relevant authorities. It is expressly stated that Linfire do not guarantee that if such standards are complied with or if a property owner exercises prudence, that a building or property will not be damaged or that lives will not be lost in a bush fire.

Further, the achievement of the level of implementation of fire precautions will depend on the actions of the landowner or occupiers of the land, over which Linfire has no control. If the proponent becomes concerned about changing factors then either a review of the existing BMP, or a new BMP, should be requested. Linfire accepts no liability or responsibility whatsoever for or in respect of any use or reliance upon this report and its supporting material by any third party.

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1.0 Introduction

1.1 Background

Trina Solar (the Proponent) is seeking to lodge a development application (DA) the proposed solar and Battery Energy Storage (BESS) facility on Lot 10896 on Plan 210818, Turkey Flat Road, Kadathinni (the project area), in the Shire of Three Springs.

The proposed facility will require the installation of the following buildings and infrastructure:

- O&M Building
- Storage/Maintenance Building
- Storage/Workshop Building (within BESS yard)
- 500 MW solar photovoltaic (PV) array and 114 inverter stations
- Centralised BESS (400 MW)
- Substation and Switchyard
- Firewater Tanks
- Internal Roads

A plan of the proposed facility is provided on Figures 1, 2 and 3 in the project Bushfire Management Plan, which includes the location of proposed buildings, renewable energy infrastructure (BESS, solar PV arrays, inverters etc) and firewater tanks.

Regarding onsite personnel, once operational, the following is expected:

- Occupant numbers likely to be 2 to 4 staff, 5 days a week (business hours)
- There will be at least one on-call technician allocated to the facility for all other times

Further information on the existing site is provided in the project BMP, namely Section 1.2.

1.2 Relevant Legislation and Guidance

- State Planning Policy 3.7: Bushfire (SPP 3.7) and the WA Guidelines.
- WAPC Position Statement: Renewable energy facilities, 2020
- CFA Design Guidelines and Model Requirements: Renewable Energy Facilities v4, 2023
- Building Code of Australia / National Construction Codes (BCA/NCC)
- AS 3959 Construction of Buildings in Bushfire Prone Areas
- AS 3745-2010 Planning for Emergencies in Facilities
- Dangerous Goods Safety Act 2004
- Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007 (the Regulations)
- Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail.

1.3 Regulatory Context

Portions of the project area are designated as bushfire prone (see Section 1.3.1 of the BMP), and should any permanent buildings be sited in these areas, the proposal would need to be assessed against *State Planning Policy 3.7: Bushfire* (SPP 3.7; Western Australia Planning Commission (WAPC) 2024) and the *Planning for Bushfire Guidelines* (the WA Guidelines; WAPC 2024). While this is not the case for the proposed development, the Proponent has elected to voluntarily respond to the bushfire risk through demonstrating compliance with SPP 3.7 and the WA Guidelines as much as practical, which is documented in the project Bushfire Management Plan (BMP).

Given the renewable energy infrastructure (e.g. BESS and solar) are not considered "habitable buildings" as defined in WA Planning Regulations, compliance with SPP 3.7 and the WA Guidelines isn't triggered and the compliance pathway with respect to bushfire, is less defined. Current advice provided by DFES is that strict compliance is unlikely to be required or achieved with SPP 3.7 and the Guidelines, however application of the CFA *Design Guidelines for Renewable Energy Facilities v4* (CFA; 2023; CFA Design Guidelines) from Victoria fire brigade, is the best publication to demonstrate compliance with at this stage, albeit rationalised for WA context.

Under the *Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007*, the operator may also be required to complete a separate risk assessment that addresses risks other than bushfire for the proposed development and the associated Dangerous Goods, should the development trigger the need to do so.

Some high-level information from the following has been provided in the subsections below, regarding the following guidance documents with respect to renewable energy infrastructure bushfire risk management:

- CFA Design Guidelines for Renewable Energy Facilities
- WAPC Position Statement: Renewable Energy Facilities
- Shire of Three Springs Firebreak Notice

1.3.1 CFA Design Guidelines for Renewable Energy Facilities

This guidance material developed by the CFA for renewable energy facilities, namely their publication *Design Guidelines and Model Requirements: Renewable Energy Facilities v4* (CFA 2023), requires that a Risk Management Plan is to be developed for renewable energy facilities which includes the following:

- Description of the risks and hazards at the facility to and from the facility and related infrastructure.
- Detail the following:
    - The location of the renewable energy infrastructure on-site and in the landscape.
    - Emergency vehicle access to and within the facility that:
        - Includes site access points of a number suitable to the size and hazard of the facility
        - Provides access to renewable energy infrastructure, substations and fire service infrastructure.
    - Firefighting water supply for the facility.
    - Asset Protection Zone/s of 10m or greater, based on radiant heat flux (output) as an ignition source:
        - Around the perimeter of the facility.

        - Between any landscape buffer/vegetation screening and renewable energy infrastructure.
    - The separation distance, based on radiant heat flux (output) as an ignition source, between:
        - Renewable energy infrastructure, buildings/structures, and vegetation.
        - All other controls for the management of on and off-site hazards and risks at the facility (including all proposed safety and protective systems).
- Provide an evidence-based determination of the effectiveness of the risk controls against the identified hazards, including justification for the omission of any battery safety and protective system/s.
- Form the basis for the design of the facility

While the facility Risk Management Plan is to address both onsite fires within renewable energy infrastructure and bushfires, this BRMP provides this relevant information detailed above for the bushfire-related risk to (and from) the proposed development.

The CFA Guidelines is organised with a number of sections as follows, each section containing guidance and what it terms “Model Requirements” for all renewable energy facilities as well as specific measures for wind, solar, battery energy storage (BESS) and substation/electric line infrastructure:

- Fire Risk Management
- Facility Location
- Facility Design
- Facility Construction and Commissioning
- Facility Operation
- Emergency Planning

A summary of the CFA Guidelines sections (relevant to this project) is provided in the compliance assessment on Table 1 in Section 4.0.

1.3.2 WAPC Position Statement: Renewable Energy Facilities

WAPC have released a Position Statement on renewable energy facilities, in which they note the following with respect to bushfire risk management:

- Renewable energy facilities in Western Australia are principally wind turbine and solar array systems.
    - There is no specific mention of BESS facilities in this Position Statement.
- The objectives of this position statement include facilitate appropriate development of renewable energy facilities while minimising any potential impact upon the environment, natural landscape, and urban areas
- Wind turbines and solar arrays in bushfire prone areas should be designed and maintained so they are not a bushfire risk to surrounding bushland, and where possible should not be in bushfire prone areas with an ‘extreme’ bushfire hazard level or bushfire attack level (BAL) - 40 or BAL- Flame Zone.
- A minimum 10 metres clearance to combustible vegetation in the form of an Asset Protection Zone (APZ) is recommended.
    - The APZ should be managed in a low threat state, in accordance with the Guidelines.

This BRMP will aim to comply with the WAPC Position Statement as much as practical.

1.3.3 Shire of Three Springs Firebreak Notice

The Shire issues a firebreak notice annually (see Appendix 7 in the project BMP), that include the following that may apply to this project:

- Fire management requirements for Rural Land
    - Firebreaks must be provided not less than 3 meters in width inside and along the whole of the external boundaries of the properties owned or occupied: where this is not practicable the firebreaks must be provided as near as possible to, and within, such boundaries
- Fire management requirements for Farm Buildings
    - Fire breaks at least 3 metres in width completely surrounding and not more than 20 metres from the perimeter of any building, group of buildings or haystacks
    - All flammable material must be removed from an area 2.7 m in width immediately surrounding the building.
- Harvest Ban Information
    - Any person may register for the SMS notification service.
        - Please note, this service does include Road Closures and other important information form time to time.
        - To register, email general@threesprings.wa.gov.au or phone 08 9954 1001.
    - If a ban has been imposed, all persons registered will be sent a text message advising of details.
    - All bans will still be broadcast on radio ABC Statewide AM
- Harvesting Operations
    - No harvesting operations are permitted on Christmas Day, Boxing Day and New Years Day.
    - A separate firefighting fire appliance is required to be present in any paddock being harvested, chaining, raking stubble, straw baling and associated allied activities during restricted and prohibited periods.
        - The firefighting unit must be in a state of readiness and have a minimum capacity of 400 litres of water, a powered pump and at least 15 metres of hose with a minimum diameter of 19 mm and capable of delivering water though an adjustable nozzle is to be readily available to any paddock being harvested.
    - All vehicles or machinery operating in a paddock during Restricted or Prohibited burning times must have a Fire Extinguisher as defined in the Act.
        - A Fire Extinguisher means a device which comprises– a. a container filled with at least 7.5 litres of water and a pump capable of discharging that water, and which is in a sound and efficient condition.
    - A Harvesting and Movement Ban and Use of Internal Combustion Engines (except for the watering and movement of stock) will be imposed when the actual weather conditions reach a Fire Danger rating of thirty five (35).
        - All such bans are at the discretion of the Chief Bush Fire Control Officer or a duly appointed person
- Mitigation measures detailed in the firebreak notice must be in place from 1 October to 15 March each year

1.4 Purpose

Based on the information above, the purpose of this BRMP is to assesses the proposed renewable

infrastructure against the relevant Model Requirements of the CFA Design Guidelines, to demonstrate the bushfire risk associated with this infrastructure has been appropriately managed. This differs to the purpose of the project BMP which is to demonstrates compliance for habitable buildings against SPP 3.7 and the WA Guidelines, however the bushfire risk management measures derived from the CFA Design Guidelines, have been incorporated into the BMP, for ease of implementation and ongoing maintenance.

The focus of this BRMP is to apply and demonstrate compliance of the proposed renewable energy infrastructure with the Model Requirements of the CFA Guidelines, with summary of the derived bushfire management measures included in the project BMP, to provide a complete summary of the Proponents bushfire risk management obligations for this project.

2.0 Renewable Energy Assets and Hazard Analysis

2.1 Onsite Renewable Energy Assets

The proposed development is expected to include the following onsite renewable energy infrastructure:

- Battery Energy Storage System (BESS) Containers (see Section 2.1.1 below)
  - Expected to be installed in nominated BESS yard
- Solar PV Arrays
  - Typically each solar PV panel is approximately 1 m by 2 m in size
  - Panels are to be mounted on a solar tracking system to follow the sun, supported on ground-mounted steel posts
- Inverter Stations (converting DC to AC power)
  - Typically skid system mounted on concrete slab or piers, and housed in purpose-made non-combustible container.
- Substation (and Switchyard)
  - Oil-insulated type distribution transformer (330 kV / 33 kV)
  - To be designed and constructed to relevant Australian Standards and Western Power specifications.

2.1.1 Additional BESS Information

The make/model of BESS and electrical infrastructure is still under review by the Proponent and is yet to be finalised, however the following information has been provided regarding the anticipated BESS:

- Grid-scale, industrial strength energy storage system including:
  - Housed in purpose-made steel container with various compartments (see Plate 2) including:
    - Battery compartment (containing Li-ion batteries),
    - Thermal management compartment (chiller) and
    - Electronics compartment (battery management system, associated power and electronic infrastructure)
  - Internal fire/thermal compartment barriers (internal fire rated walls), in particular separating the battery compartment from all adjacent compartments.
  - Thermal management system consisting of a chiller unit (fire separated from battery compartment)
  - Battery management system to monitor and manage battery functionality, and provide early warning of faults especially thermal runaway.
  - Internal fire and gas monitoring/detection system, connected to the plant wide control system, providing early warning of internal fire or gas accumulation.
  - Internal fire suppression system/s including aerosol suppression system within the containers, with potential internal fire sprinkler system being reviewed.
  - Ventilation system including explosion proof fan system with low-level inlet and high-level outlet/exhaust
- Certified under UL9540A
- Will contain new rechargeable lithium-ion batteries (UN3480/ UN3481)
  - Class 9 Miscellaneous Dangerous Goods

- HAZCHEM 4W
- Will be sited solely in the nominated BESS areas

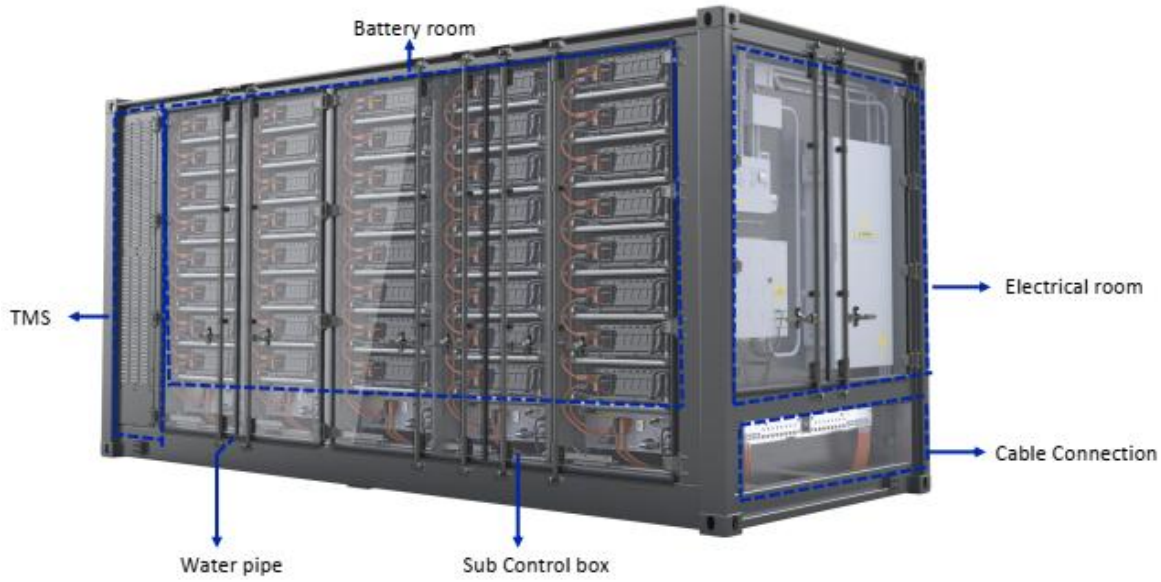


Plate 1: Indicative BESS compartmentation

2.2 Site Description

A description of the site is provided in Section 1.2 of the project BMP, with a brief summary provided below:

- The project area is approximately 624.2 ha of existing agricultural land within Lot 10896, and is surrounded by the following
  - Scrub vegetation to the south in the balance of Lot 10896.
  - Scrub vegetation within Turkey Flat Road verge to the east.
  - Grassland with isolated plots of scrub/forest vegetation to the north within Lot 10897.
  - Grassland and significant plots of scrub and woodland vegetation within Lot 10895 to the west
- There is an ting transmission line, and associated 60 m wide easement, within the project area, that runs from the south-west corner through to the central northern part of the project area.
- Public road access to the project area is via Turkey Flat Road, which extends north to Three Springs-Eneabba Road, and south to Carnamah-Eneabba Road.
- There is no existing reticulated town main water supply, nor any existing street hydrants to the site.

2.3 Bushfire Hazard

While the renewable energy infrastructure is not required to achieve target BAL ratings as per the CFA Guidelines, do provide some high-level guidance on separation of BESS from unmanaged vegetation, and this has been supplemented by additional research to establish target BAL ratings

for the various renewable energy infrastructure. On this basis, as BAL contour mapping has been undertaken for the proposed buildings in the BMP, this has been extended to the entire proposed facility including the renewable energy infrastructure.

The BAL contour assessment for the entire project area, has been undertaken in accordance with Method 1 of AS 3959, and is detailed in Section 3 of the project BMP, and assumes the following:

- State-adopted FDI 80 rating;
- Vegetation and effective slope classifications within the project area and 150 m assessment area, as depicted on Figure 3 and summarised on Table 1 of the project BMP.
    - the vegetation classifications and effective slope observed at the time of inspection; and,
    - the anticipated post-development vegetation based on proposed on-site clearing extent, and resultant vegetation exclusions and separation distances, achieved to implement the proposed development and nominated Asset Protection Zones.

Based on the above, a BAL contour map was produced for the project area on Figure 4 in the project BMP, and depicts the BAL contours across the site.

2.3.1 Likelihood of Bushfire Impact

The likelihood of bushfire impact on renewable energy facilities is tied to the potential for bushfires to impact the site. To provide some guidance on this, historical bushfires have been depicted on Plates 1 and 2, using the following publicly available datasets:

- Firewatch which is a Landgate service that uses satellite remote sensing imagery to detect fire hotspots and burnt areas, to track live bushfires but also to review the broad extent of past fire events from 1989 to present day.
    - While there hasn't been any fires recorded within 10 km of the site, it is clear that fires have occurred regularly in similar landscape.
- DBCA Fire History dataset which contains a collection of records of fire events (prescribed burns and bushfire) which were captured on departmental-managed land, and where available non-department managed land in Western Australia. The earliest records available are from 1937.
    - The DBCA record largely identifies fires within various nature reserves and national parks in the region, with few appearing to significantly break out of the reserve or park of origin.
    - There have been two recorded fires within or near the project area:
        - The main fire was recorded in 1972 (apparently digitised from historical data) and involved much of the scrub to the south and west of the site, as well as penetrating into the grassland within the site.
        - The other fire occurred in 1994, and involved the scrub and woodland vegetation to the west of the site. This fire occurred in June, and was likely a prescribed burn, however it is difficult to determine.
    - While it the reporting is not well labelled, it is likely that some of the recorded fires are prescribed burns, however there is evidence that a number were bushfires.

The historical data depicts that while bushfires have regularly occurred in the local region, especially in areas of retained vegetation, few have occurred in grassland or spread into the project area. This is likely due to the improved ability to manage the bushfire fires as they spread into the agricultural land from the areas of more continuous vegetation, due to reduced fire behaviour and increased access for attending firefighters. While there appear to be few historical bushfires within the site, this BRMP assumes that bushfire impact could occur in the future, and addresses the risk accordingly.

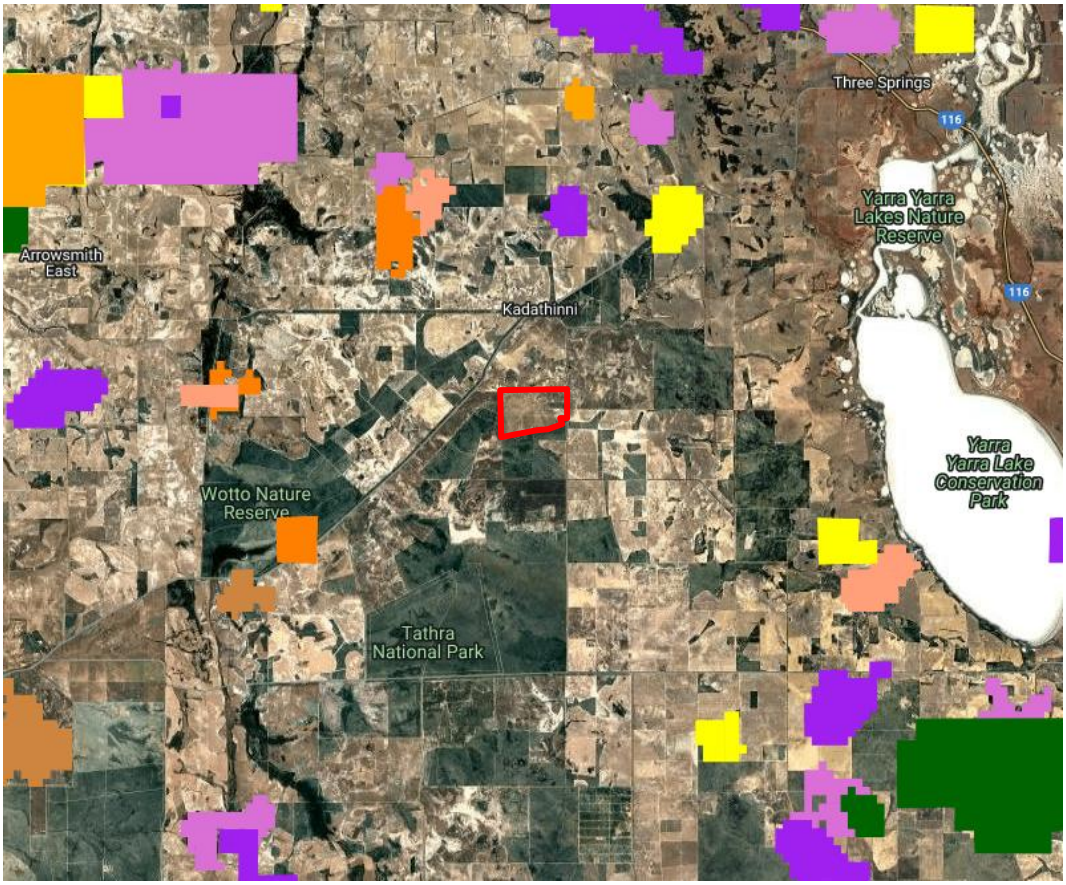


Plate 2: Bushfire History (Firewatch 2025)

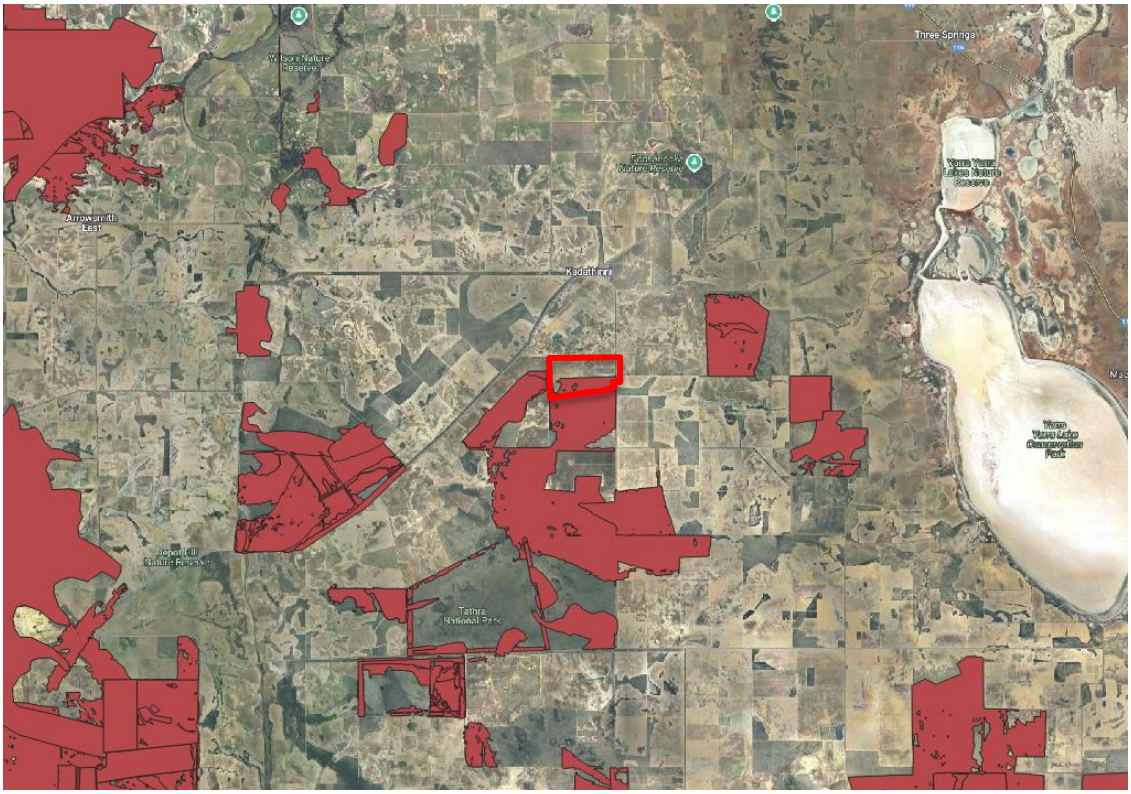


Plate 3: Bushfire History (DBCA 2025)

2.3.2 Bushfire Hazard Summary

The greatest bushfire threat to the proposed development is from the south and west of the subject site, largely through low scrub (in the south) and scrub and woodland vegetation (to the west). While a fire from those directions would likely display significant fire behaviour, given fire runs tens of kilometres long are possible from all directions, fully-developed bushfire behaviour through would also be possible from all directions, albeit with more grassfire characteristics from the north and east. If the bushfire risk is not managed, elevated radiant heat and direct flame could impact on proposed infrastructure, associated with moderate to minor ember attack, noting that grassfires tend to have a very quick residence time for any radiant heat impact, and with little associated ember attack.

2.4 Renewable Energy Infrastructure Hazard and Risk Analysis

The main hazard is that posed by the BESS units, with other potential hazards also associated with high-voltage energised infrastructure such as substation.

The CFA Guidelines notes that fire hazards at BESS facilities may include the following:

- Electrical hazards, such as battery faults; overcharging; rapid discharge; loss of remote monitoring systems; internal short circuits; overheating; water ingress; lightning strike (leading to thermal events/runaway).
- Chemical hazards, such as the inherent hazards of the stored dangerous goods; spills and leaks of transformer oil/diesel, refrigerant gas/coolant; chemical reactions.
- Explosions, from ignition of venting gases. Potential fire spread due to proximity of batteries (and containers/enclosures) to each other, on-site infrastructure and vegetation (including screening vegetation).
- Mechanical damage to battery containers/enclosures due to vehicular impact. Landscape hazards, such as bushfire/grassfire ignition from fire within the facility, or external ignition of site infrastructure from embers, radiant heat and flame contact.

From a bushfire risk assessment and management perspective, much of the above can be distilled into the potential impact of bushfire on the proposed renewable energy infrastructure (especially the BESS containers), and the ability for significant fires from the renewable energy infrastructure (especially the BESS containers) to ignite a bushfire.

2.4.1 Battery Energy Storage System (BESS) hazard review

BESS units are typically comprised of Lithium-ion (Li-ion) battery cells that are wired together to form modules, which have a battery management system (BMS) that prevents electrical imbalances in the battery cells, including with voltage, current and temperature. The BMS' main function is to shut down operations of the module (or system) if any of the voltage, current, or temperature changes are out of limit.

2.4.1.1 Thermal runaway in Li-ion batteries

The significant hazard posed by BESS units is primarily associated with thermal runaway occurring in the Li-ion batteries, and the fire and explosion risk that can accompany the release of flammable gases. Thermal runaway describes a process that is accelerated by increasing internal temperature, in turn releasing more energy that further increases temperature.

In Li-ion batteries thermal runaway is a condition where voltage, current or temperature instability, causes the battery cell temperature to rise which in turn increases the current with a further rise in temperature. The battery can begin to emit gases due to thermal decomposition of the electrolyte solvents, which could potentially result in fire ignition or explosion (of the flammable gas release).

Battery cells can fail at different rates under different modes of off-gassing (flammable gas release),

which can be with or without flaming. Because thermal runaway can occur without flame, gases may not be consumed by an ignition source immediately after they are emitted, this can create a scenario where high heat and combustible gases can coexist without igniting, and accumulation of these gases can result in an explosive event should an ignition source be subsequently introduced.

There are differences between thermal runaway and conventional fires that are important to understand. A conventional fire (e.g. campfire) is sustained by a combination of fuel, heat, and oxygen, where if any one of them is removed, the fire may be extinguished (e.g. suffocating the fire to remove oxygen, applying water to cool it, or dispersing the wood to remove fuel).

Thermal runaway in a Li-ion battery differs from the conventional fire, as a Li-ion battery is consumed in thermal runaway is fuelled by an internal chemical reaction that releases heat and can continue without oxygen or a visible flame. As such, the management of thermal runaway differs from that of a conventional fire because starving a thermal runaway event of oxygen, may have little effect until the fuel is consumed. On this basis, stopping a thermal runaway event is more difficult and is generally addressed by either cooling to remove heat, or removing/dispersing the fuel.

While thermal runaway and fire are two different processes in a Li-ion battery failure, one can lead to the other including:

- an external fire can send a battery into thermal runaway, or
- thermal runaway can create a secondary fire as it begins to the burn plastic and remaining battery materials.

2.4.1.2 Historical failure events (Li-ion battery and BESS)

The hazard of Li-ion battery thermal runaway and off-gassing has been identified in research and public literature since the early 2000s, including extensive safety testing. Additionally, a number of failure events have created further awareness to the dangers of thermal runaway in Li-ion batteries, including the following (DNV-GL, 2020; ESV, 2021):

- **2006-2007** - Dell laptop computer battery thermal runaway from several laptops catching fire due to an internal defect in the battery cells that led to thermal runaway.
- **2011** - Chevrolet Volt battery thermal runaway after crash testing, resulting in the car catching on fire.
- **2013** - Tesla Model S after impact with road debris punctured the battery pack, causing it to go into thermal runaway.
- **2017-2018** - BESS fires in a large facility in South Korea, however there is limited reporting and there appears to be some conflict regarding the causes of the failures.
- **2019** – McMicken BESS Failure Event, Arizona
    - This involved thermal runaway of a BESS container, that resulted in off-gassing and subsequent explosion of the BESS when the container door was opened by attending firefighters.
    - Several post-incident reports have been produced since the failure event, and these are summarised in Appendix B.
    - It is noted that the BESS technology and standards has progressed significantly since this event, which represents an example of BESS failure prior to many of the recent improvements in fire and explosion safety measures.
- **2021** – Victorian Big Battery fire
    - A Tesla Megapack at a facility in Geelong caught fire and spread to a neighbouring Megapack during the initial installation and commissioning, which didn't spread any further and burned out over the course of approximately six hours.

- Several post-incident reports have been produced since the failure event, and these are summarised in Appendix B.

- **2023** – Bouldercombe Battery Project, Queensland
  - A Tesla Megapack ignited at a facility in Bouldercombe, and was allowed to burn out buy attending firefighters, without firewater, as a low intensity fire. Firefighters monitored temperatures to ensure fire didn't spread to adjacent BESS units, and monitored gas levels and conducted air sampling to manage risk to nearby residents.
  - Several post-incident news reports have been produced since the failure event, and these are summarised in Appendix B.

While there have not been many historical BESS failure events that have occurred in Australia, with the Victorian Big Battery and Bouldercome Battery Project fires the most notable to date, it is unclear if this could also be attributed to a lack of reporting. Additionally, it is worth noting that there doesn't appear be reported instances of bushfires destroying or producing a thermal runaway event within a BESS, however this could also be due to lack of opportunity given the relatively short amount of time this infrastructure has been commercially available.

2.4.1.3 Li-ion battery testing

Additionally, there has been some testing information conducted on BESS units, with summaries of the testing methodology and results provided in Appendix B.

- **2015** - Fire Protection Research Foundation conducted internal and external fire testing on a Tesla Powerpack as part of a hazard assessment of lithium-ion battery energy storage systems (FPRF, 2016).
- **2021** - Fisher Engineering Inc. performed an analysis of the Megapack energy storage system, including review of the construction, design, fire safety features and UL9540A large-scale fire test data against the regulatory requirements in International and US fire codes and standards (FEI 2020).

It is noted that the testing is primarily conducted of Tesla products, which appear to be configured somewhat differently to the larger containerised versions such as being proposed for this project, and so the outcomes may not be directly applicable.

Additionally, there is limited information is provided regarding the potential flammability of off-gassing from a Li-ion thermal runaway event, which may have been specific to the product. Notwithstanding, the potential explosive risk caused by flammable gases does appear to be becoming more of a focus, especially after events such as the BESS failure in Arizona, and definition and management of this hazard more critical, especially the release of trapped unignited gases.

2.4.1.4 BESS Standards

The main standards for BESS testing, construction and installation, include:

- UL 9540 (2023): Energy Storage Systems (ESS) and Equipment
- UL 9540A (2019): Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems
  - supplementary document to UL 9540 that defines test methods for thermal runaway.
- NFPA 855 (2023): Standard for the Installation of Stationary Energy Storage Systems
- International Fire Code (2021): Chapter 12 Energy Systems

2.4.1.5 Likelihood of BESS Facility Fire

As noted on Section 2.4.1.2, there appears to be a relatively low likelihood of BESS fires based on

historical occurrences in Australia, however it is noted that these type of grid scale BESS facilities are relatively new with the opportunity for failure and fire also limited, and the statistics around fire losses are based on historical estimates and incomplete datasets. There is also varying levels of resultant damage associated with these fires, which can range from small ignition events that have minor damage, through to complete destruction of at least one BESS unit or potentially multiple units.

2.4.1.6 BESS hazard summary for bushfire

The overall hazard with the BESS units, is largely associated with the potential for thermal runaway in the Li-ion batteries to produce a fire or explosion failure event.

The rise of the BESS industry has been very quick, and the has resulted in rapid advances in the design, construction, commissioning, operation and maintenance of this technology. Notwithstanding, there hasn't seeming been a many reported historical BESS fires or explosions, and certainly not in Australia, however when they have occurred, it is clear that they result in significant firefighting challenges, primarily due to the inability to easily extinguish the fires and manage flammable gases.

The Arizona BESS failure in particular has highlighted historical issues with this for attending firefighters, as well as the potential for catastrophic failure to ignite vegetation some distance from the BESS (UL, 2020).

From a bushfire risk management perspective, the hazard related to the BESS units can be distilled to the following:

- Exacerbation of a bushfire from fire and/or explosion of the BESS's as follows:
    - A bushfire impressing significant radiant heat, or producing direct flame impingement, onto the BESS container, that could increase battery temperatures and send into thermal runaway. This could also include the damage or destruction of supporting systems (e.g. BMS, thermal management) which might affect the ability of the BESS to maintain temperatures at required levels.
    - Ember attack from a bushfire, igniting a fire within the BESS unit, that could send a battery into thermal runaway, or damage or destroy supporting systems.
    - Ember attack from a bushfire igniting flammable gases from BESS with thermal runaway condition, either within the BESS or flammable gases being ventilated.
- Ignition of a bushfire as a result of a fire or explosion within the BESS, likely to be associated with thermal runaway igniting an internal fire and/or emitting flammable gases, which could result in an explosion.

The bushfire risk management principles expected to address the hazards above are explored in further detail in Section 2.5.

2.4.2 Solar PV Hazard

2.4.2.1 Fires in Solar PV facilities

There appear to have been a limited number of bushfires in Australia resulting from solar PV facilities, at least those being reported. One occurred in Queensland in 2019 as a result of a rubbish fire, which produced a grassland fire. Another bushfire in NSW occurred in early 2022, burned out 5 ha of land beneath the panel array, with attending firefighters mainly controlling the spread from the facility and concluded that while there was no structural damage, there was likely damage to the panels and wiring. As recently as a month ago an inverter ignited in Victoria, which spread a short distance through unmanaged grass beneath nearby solar panels, which was to be rectified following the fire.

Given the limited history of solar PV bushfires in Australia, it could be surmised that the instance of fires from solar PV is relatively low, however it is unclear whether this is due in part to a lack of reporting. It is also clear that the vegetation surrounding the solar panels is also a key consideration in reducing the risk associated with solar PV facilities, both from the perspective of being able to support fire spread from faulty solar panels or infrastructure, but also with respect to minimising the impact of bushfire on the solar panels themselves. The solar panels are predominantly constructed of glass and metal parts which are unlikely to support significant fires, however they do contain plastics and wiring, which can be damaged. Additionally, the panel mounting posts will also be non-combustible (likely steel), so will not contribute to the fuel load or support fire.

The only other element of the solar PV array is the cabling between panels, inverters and back to substation, which could also be involved in a bushfire. To avoid or limit this, it is recommended that vegetation management also occur around areas where there is exposed cabling, and should also be designed to either be below ground or as high as possible.

All electrical equipment (e.g. electrical cabling, junction boxes, inverters and transformers) must comply with relevant design, construction and installation standards of electrical equipment including relevant Australian Standards.

2.4.3 Transformer Hazard

The causes of fire hazards relating to transformers are typically categorised as one of the following:

- Electrical equipment containing combustible insulating liquids may rupture due to internal failure, and there may be fire ignition or an explosion.
- Electrical equipment without combustible insulating liquids may rupture due to internal failure; there still be an explosion with a modest fire risk.
- Other plant and equipment such as cables, batteries, and drainage pipes may catch fire and spread the fire.

The risk associated with transformers, relates primarily to the oil used in transformers (where oil-filled) for insulation and cooling, which could potentially leak and be ignited. The ground mounted transformers are oil-filled and contains a hermetically sealed steel tank that contains the transformer core surrounded with windings and connecting leads which are separated, insulated and cooled by mineral oil (oil impregnated upgraded wood pulp insulation) or ester oils.

Potential failure of the transformer can occur if the ambient temperature is raised above the rating of the transformer (typically 105°-140°) for an extended time, with short-term heating able to be addressed through power supply reduction or shutdown. While overheating can result in degradation of the transformer, the main risk is the potential for cracking of the tank and resultant oil loss and potential pool fire of the flammable mineral or ester oil.

Previous correspondence from power supply providers has been there are historically very few transformer fires, with most associated with lightning strikes on pole-top transformers in non-built-up areas. They have assessed the likelihood of a transformer fire occurring as being approximately 0.1%, or with accumulated probability of 4% per transformer over its typical service life.

While there is not a high probability of transformer fires, it could result in transformer loss and/or damage to adjacent infrastructure or combustible items. As such, fire protection measures are considered a critical part of the design of transformers which include the following:

- Transformers are designed in accordance with various standards, including AS 2067 (Substations and High Voltage Installations) and AS/NZS 60079.14 (Explosive atmospheres – Electrical installations design, selection and erection) to reduce risk of fire, with a variety of measures incorporated to minimise potential for fire ignition.
- Cable clamps and support to limit leaking bushings.

- Managing limits for transformers to prevent overloading.
- Providing sufficient clearances to transformers based on oil volume, incorporation of oil containment and/or flame trap, or provision of a fire screening wall
    - The incorporation of an oil bund and/or flame trap enables a reduction in minimum separation distance as it contains the spread of any leaked oil and reduces the size of the oil pool exposed to oxygen, which is limits combustion.
    - Provision of a fire screen wall (2 hr FRL) also enables reduced minimum separation distances as it shields the transformer from adjacent buildings and combustible items and ignition risks.

2.5 Derived Bushfire Risk Management Principles

Based on the analysis of the bushfire hazards and risk associated with BESS and solar facilities, and the information from testing and historical failure events, the following are considered key bushfire risk management requirements to be incorporated into the proposed development to manage bushfire risk, both to protect the renewable energy infrastructure from bushfire, and also to manage the risk of bushfire ignition from infrastructure fire.

- Considered siting of renewable energy infrastructure to minimise bushfire risk as much as practical, noting the siting of renewable energy facilities is based on a number of factors.
- Incorporating sufficient vegetation management to limit radiant heat impact and prevent direct flame impingement on the renewable energy infrastructure, but also to ensure a BESS explosion is not able to readily ignite surrounding vegetation.
    - No trees are to be located close enough to BESS's such that any falling branches or trees could mechanically damage the BESS (which might cause thermal runaway).
- Provision of appropriate vehicular access to the renewable energy infrastructure facility for attending firefighters
- Provision of secure firewater supply for attending firefighters.
    - It is noted that the preferred onsite response may include leaving a BESS unit to burn out rather than applying firefighting water, but this may depend on various factors.
- Appropriate renewable energy infrastructure design and construction to:
    - For BESS facility
        - Limit potential for thermal runaway and associated off-gassing.
        - Incorporates a combined strategy of fire detection (and gas monitoring) and suppression followed by ventilation (and gas ventilation) and cooling, including all required infrastructure to achieve this.
    - For solar PV arrays
        - Ensure sufficient separation between solar banks (or restrict overall area) to limit potential for fire spread between banks for panels.
    - Incorporate remote monitoring and communications, so the status of BESS BMS and fire/gas detection systems can be monitored and any information conveyed to relevant parties including fire brigade.
- Ensure sufficient information regarding the facility, its hazards and emergency management procedures is available to assist any attending firefighters.
- Engage with local fire brigade during project development and commissioning process, to ensure they understand the system and be aware of its specific hazards.
- Develop an emergency management plan which comprehensively details:

- The hazards associated renewable energy infrastructure including following for BESS facility:
  - Li-ion battery technology including the potentially explosive nature of the gases released during Li-ion battery thermal runaway,
  - Response procedures that incorporate system monitoring, the detection of gases, ventilation practices, extinguishing methods, and information to gather before entry.

2.6 CFA Guideline Requirements

As detailed in Sections 1.3 and 1.4, the CFA *Design Guidelines and Model Requirements: Renewable Energy Facilities v4* (CFA, 2023) are currently seen as the best guidance for renewable energy facilities available at this point in time. The CFA Guidelines provide a comprehensive suite of design, construction, operation and emergency planning measures recommended for renewable energy facilities, that address the risk of fire within the infrastructure, but also bushfire risk to the development.

CFA (2023) notes that any planning applications for all renewable energy facilities proposed in bushfire prone areas, strengthened or additional risk mitigation measures will be required to address bushfire risk, and will also need to address the following:

- The impact of any ignition events arising from the renewable energy infrastructure on nearby communities, infrastructure and assets.
- The impact of bushfire on the renewable energy infrastructure (e.g. ember attack, radiant heat impact, flame contact).
- Assessment of whether the proposal will lead to an increase in risk to adjacent land and how the proposal will reduce risks at the site to an acceptable level.

A summary of the CFA Guidelines sections (relevant to this renewable energy infrastructure facility project) is provided in the compliance assessment on Table 1 in Section 4.0, which includes the following:

- Siting and vegetation management requirements to ensure the renewable energy infrastructure fully involved in fire does not create the potential for ignition of vegetation, nor spread to adjacent infrastructure.
- Vehicular access provisions for emergency services vehicles
- Firewater provisions for attending firefighters
- Design, construction and commissioning requirements for renewable energy infrastructure (especially BESS and substation) and any Dangerous Goods
- Ongoing operation, maintenance and housekeeping requirements for renewable energy infrastructure (especially BESS)
- Familiarisation visits and emergency information for attending firefighters and emergency services personnel
- Development and preparation of comprehensive Emergency Management Plan for the facility, with relevant prevention, preparedness and response information for bushfires and onsite infrastructure fires.

3.0 Bushfire Risk Strategy and Management Measures - Renewable Energy Assets

Based on the guidance from the review of the renewable energy assets, hazards, testing and historical fires in Section 2.0, and informed by the relevant Model Requirements of the CFA Guidelines, the following bushfire safety strategy and associated risk management measures are to be incorporated into the proposed facility to manage bushfire risk to the renewable energy infrastructure, while also managing the escape of fire within the infrastructure to ignite a bushfire.

It is noted that while most management measures relate to management of bushfire impact on the proposed renewable energy infrastructure, some also relate to internal hazards which is also critical to avoid ignition of bushfires.

The subsections below detail the proposed bushfire risk management measures to be adopted by the project, with a compliance assessment in Section 4.0 demonstrating how these measures align with the principles from the CFA Guidelines.

The risk management measures have also been summarised in the BMP, to provide a comprehensive list of the Proponents bushfire risk management obligations for this project. Where possible, the bushfire management measures for both the buildings and renewable energy infrastructure have been depicted on Figure 5 in the BMP.

3.1 Renewable Energy Infrastructure Vegetation Management and Separation

The following Non-Vegetated Zone (NVZ) and Asset Protection Zones (APZ) are to be established around renewable energy infrastructure, to protect infrastructure from approaching bushfire impact, while also reducing the potential for onsite infrastructure fires to ignite a bushfire.

- NVZ/APZ around the perimeter of all renewable energy infrastructure including
  - BESS cells (BESS yard)
  - Solar PV arrays and Inverter Stations
  - Substation and switchyard envelope.
- Non-vegetated land within perimeter NVZ/APZ of the following:
  - BESS cells (BESS yard)
  - Substation and switchyard envelope
- Non-vegetated land or managed vegetation within solar PV arrays and around inverter station (i.e. within perimeter NVZ/APZ around solar PV arrays)

Where stipulated, the NVZ/APZ must be non-vegetated, however outside this they can be either non-vegetated or managed low threat landscaping established in accordance with the APZ standards from the WA Guidelines and AS 3959 Clause 2.2.3.2 (e) and (f), however would preferably be non-vegetated where possible.

All onsite vegetation modification and management (including NVZ/APZ) is to be conducted and maintained by the Proponent for the life of the facility.

It is noted that there is minor NVZ/APZ incursion into the Western Power transmission corridor (in addition to internal road crossings), and while these areas are currently grazed land devoid of vegetation, it is assumed that the Proponent will secure the necessary permissions from Western Power to implemented to clear and maintain vegetation their land.

3.1.1 BESS System

Given the potential for BESS units to react to elevated temperatures, NVZ/APZ to achieve no less than BAL-12.5 is considered appropriate. Additionally, given there has been historical BESS explosion igniting vegetation 23 m from the container, the NVZ/APZ for the BESS is to be no less

than 25 m wide, to manage risk of bushfire ignition from an explosion. It is noted that this historical explosion was in a BESS that didn't have explosion management system nor many of the fire and safety features currently required, and as such, is not likely to be replicated, so the 25 m minimum NVZ/APZ is considered very conservative.

Based on the above, the following NVZ/APZs will be required for the BESS system:

- The BESS units are to have a 25 m wide perimeter NVZ/APZ consisting of the following:
  - A 10 m wide NVZ adjacent to the BESS units, that is non-combustible (constructed of concrete, mineral earth or non-combustible mulch etc) and free of vegetation and obstructions at all times, with no plant or equipment unless totally non-combustible.
  - Outside the 10 m NVZ, the remaining 15 m can be non-vegetated or otherwise comply with the APZ standards from the WA Guidelines, with the following clarifications:
    - Have no trees located close enough to BESS's such that any falling branches or trees could mechanically damage the BESS
    - Largely consist of managed grassland (<100 mm in height) or low groundcovers
- 10 m wide NVZ/APZ around any firewater tanks associated with the above BESS system, to achieve BAL-29 or lower, and provide separation from any renewable energy infrastructure.
  - No renewable energy infrastructure is permitted in the 10 m NVZ/APZ around any firewater tanks

All land within the BESS perimeter APZ (i.e. within BESS yard), are to be non-combustible (constructed of concrete, mineral earth or non-combustible mulch etc) and free of vegetation and obstructions at all times, with no plant or equipment unless totally non-combustible.

Separation between the BESS's, substation and any other renewable energy or electrical infrastructure, must be at least the distance where the radiant heat flux from a fully involved in fire in the infrastructure, does not create the potential for ignition of these site elements (adjacent battery containers/enclosures, on-site buildings, substations).

- This is outside the bushfire scope, and is expected to be addressed by complying with relevant codes and standards, including Australian Standards, and any manufacturers recommendations.

3.1.2 Substation and Switchyard

In order to ensure sufficient separation is maintained between proposed substation/switchyard, and surrounding unmanaged vegetation, the following NVZ/APZs will be required:

- A 10 m wide perimeter NVZ/APZ to achieve BAL-29 or lower on the envelope.
  - Ideally the perimeter NVZ/APZs around solar panel arrays and inverters should be non-combustible (constructed of concrete, mineral earth or non-combustible mulch) and free of vegetation as much as practical, or otherwise compliant with the APZ standards, with no plant or equipment unless non-combustible.

Additionally, all land within the substation/switchyard perimeter APZ (i.e. with substation/switchyard envelope) is to be non-combustible (constructed of concrete, mineral earth or non-combustible mulch etc) and free of vegetation and obstructions at all times, with no plant or equipment unless totally non-combustible.

3.1.3 Solar PV Arrays

In order to ensure sufficient separation is maintained between proposed solar PV panels and inverter stations, and surrounding unmanaged vegetation, the following NVZ/APZs will be required:

- A 10 m – 15 m wide APZ, is to be established around the perimeter of the solar panel arrays and Inverter Station envelopes, to achieve BAL-29 or lower on this infrastructure.
    - Ideally the perimeter NVZ/APZs around solar panel arrays and inverters should be non-combustible (constructed of concrete, mineral earth or non-combustible mulch) and free of vegetation as much as practical, or otherwise compliant with the APZ standards, with no plant or equipment unless non-combustible.
- 10 m wide NVZ/APZ around any firewater tanks associated with the above solar PV system, to achieve BAL-29 or lower, and provide separation from any renewable energy infrastructure.
    - No renewable energy infrastructure is permitted in the 10 m NVZ/APZ around any firewater tanks

Within the perimeter APZs, all vegetation beneath the solar panels and around inverter station (Plot 8) is to be managed to limit the potential for ignition and spread of fire from an electrical fault, or damage to panels from an external bushfire.

- Ideally this would be kept in a non-vegetated state, however management of grass to less than 100 mm in height as per the APZ standards during bushfire season is also sufficient.

Additionally, it is important that adequate separation is provided between solar panel banks to limit fire spread and facilitate safe and effective firefighting operations. On this basis, 6 m separation is to be provided:

- between solar panel banks (i.e. a bank of solar panels connected to a single power conversion unit/inverter), or
- so that no unbroken area of solar panels is greater than 25ha.

Separation between the inverters and solar panels arrays and any other electrical infrastructure, must be at least the distance where the radiant heat flux from a fully involved in fire in the infrastructure, does not create the potential for ignition of these site elements (other equipment, on-site buildings, substations).

- This is to be addressed by complying with relevant Australian Standards and any manufacturers recommendations.

3.2 Renewable Energy Infrastructure Vehicular Access

- The provision of at least two (2) access points to the facility, to ensure access to/from the facility to the greater road network, can be achieved during a bushfire emergency.
- All nominated site entrances are be fitted with gates as follows:
    - Provide at least 6m clear horizontal width
    - If locked, any keys are issued to DFES and any local fire brigade.
- Ensure suitable vehicular access to BESS yard, noting the following:
    - Provide a perimeter road around the BESS cells, and provide access in between the BESS cells,
    - All internal roads are to comply with private driveway specifications of WA Guidelines other than the following:
        - All roads within BESS yard are to be minimum of 6 m wide.
- Ensure suitable vehicular access to solar PV arrays as follows:
    - Internal road access is to be provided as perimeter loop roads around each solar PV array.

- Design to ensure at least two (2) but preferably more access points to each solar PV array (i.e. not single points of access)
- All internal roads are to comply with private driveway specifications of WA Guidelines noting the following:
  - The roads are to be at least 4 m wide, but if <6m wide, passing bays are to be provided every 200 m that are 6m wide x 20m long.

- The internal road network needs to provide vehicular access to each proposed firewater tank, with access is to be provided to within 4 m of the tank suction point.
- Emergency Information Book and Signage (see Section 3.8) is to be provided at the nominated site entrance, for attending emergency services personnel.
- The internal road network, site entrances, gates and signage are to be constructed and maintained by the Proponent in perpetuity (or for the life of the facility).

3.3 Renewable Energy Infrastructure Firewater Supply

The following assumes that there is no reticulated water supply to the site as is currently the case, with the firewater supply for the renewable energy infrastructure to be provided as follows for the various systems, with all also meeting the following:

- All firewater tanks will also need to comply with the standards from the WA Guidelines, and the following from the CFA Guidelines:
  - Must be an above-ground water tank constructed of concrete or steel and must comply with AS 2419.1 and signage indicating 'FIRE WATER' (or similar approved) and the tank capacity must be fixed to each tank.
  - The tank suction point must be within 4 m of a road or hardstand
- All firewater tanks are to be sited further than 10 m from infrastructure and buildings, as well as in an area of BAL-29 or lower
  - To ensure this is implemented, a 10 m wide NVZ/APZ around the perimeter of the tank/s
  - No infrastructure or buildings are permitted in the 10 m NVZ/APZ, and all land between the tank/s and nearby infrastructure, or buildings is to be non-vegetated.
- Vehicular access to the firewater tank/s is to be via proposed internal roads.
  - Vehicular access (compliant through road or with turning head) is to be provided to within 4 m of the tank suction point.
- Emergency Information Book and Signage (see Section 3.8) is to be provided at the site entrance, for attending emergency services personnel.
  - This is to include the location of all onsite firewater tanks and the internal access routes to these tanks.
- The firewater tanks (or any other firewater systems), and associated NVZ/APZs, are to be constructed and maintained for the life of the project by the Proponent.

3.3.1 BESS System Firewater

- While the CFA Guidelines require a significant firewater capacity for BESS facilities, the Proponent has been advised that manufacturers are typically not recommending use of firewater on BESS fires, and it appears that evidence from recent BESS fires (e.g. Bouldercombe) that the firefighting response maybe evolving toward this practice.
  - ***Based on the above, while compliance with the CFA Guidelines is stated as a requirement of this report as detailed below, it is also noted that the CFA Guidelines may lag current practice, and on this basis, should DFES and the Proponent review the firewater system requirements and agree to a***

rationalised system or firewater capacity in line with current BESS firefighting responses, then this BMP would view this as an acceptable deviation from the CFA Guidelines.

- The firewater supply for the BESS infrastructure is to be compliant with the CFA Guidelines for BESS facilities in areas without reticulated water supply, as summarised below (unless agreed otherwise with DFES as detailed above):
    - The firewater supply must be of a quantity no less than 288,000L or as per the provisions for Open Yard Protection of AS 2419.1-2021, flowing for a period of no less than four hours at 20L/s, whichever is the greater.
    - The quantity of static firewater storage is to be calculated from the number of hydrants required to flow from AS 2419.1-2021: Fire hydrant installations, Table 2.2.5(D).
    - Fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet.
    - The firewater supply must be located at vehicle entrances to the facility, at least 10m from any renewable energy infrastructure and buildings.
    - The firewater supply must be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency. (e.g. Fire water tanks are to be located closer to the site entrance that the battery energy storage system).
    - The firewater supply must comply with relevant Australian Standards (including AS 2419.1)
- Given the substantial amount of firewater required, no additional capacity is proposed for bushfire fighting purposes (other than the 10 kL per building required to comply with the WA Guidelines)

3.3.2 Solar PV System Firewater

- Additional firewater supply for solar farm should be by firewater tanks in accordance with the CFA Design Guidelines as follows:
    - Provision 45 kL firewater tank at the main entrance to the facility
    - Provision of additional fire water tanks of at least 45 kL effective capacity for every additional 100 ha of solar PV panels (after the initial 100 ha).

3.3.3 Provision of mobile fire trailer

In addition to firewater supplies, a mobile fire trailer (or similar approved) is required to enable the onsite staff to:

- have on standby during any approved tasks that may ignite a bushfire (e.g. hot-works etc), or
- provide a rapid first response to any small onsite ignition events while the fire is in the incipient stage to prevent growth and spread of the fire

This firefighting infrastructure is not to be used by staff to fight developed bushfire i.e. staff not expected to fight bushfires.

As a minimum, the fire trailer (or similar approved) should have:

- No less than 1000 L tank
- Fire pump and hose reel
- Mounted on trailer or ute to enable easy transport around the site.

- If on trailer, sufficient vehicles shall be onsite with capability to mount the trailer (e.g. equipped with appropriate tow balls).

The Proponent is to supply the fire trailer (or similar approved) prior to commissioning, and ensure it is maintained and ready for use at all times during bushfire season, including ensuring a full water tank and pump fuel tank.

3.4 Renewable Energy Infrastructure Design

The following measures are required for the proposed renewable energy infrastructure to manage the risk of fires, with more specific guidance provided in subsections below:

- All electrical equipment, including electrical cabling, junction boxes, inverters and transformers, must comply with relevant design, construction and installation standards of electrical equipment including relevant Australian Standards, and manufacturers recommendations.
- Appropriate system monitoring for all electrical infrastructure must be provided, especially the BESS unit BMS and fire/gas detection, to ensure that any electrical or equipment failures with the potential to ignite or propagate fire are rapidly identified and relevant site personnel notified to enable early fire brigade notification.
    - Monitoring is to be configured to provide warning to relevant onsite and offsite personnel.

3.4.1 BESS System

- Ensure the following elements are included in the BESS:
    - External container is to be non-combustible material (e.g. metal).
    - Use suitable Li-ion batteries (or appropriate alternative), with sufficient cell quality and barriers, to limit potential for thermal runaway generating from internal cell defects and cascading thermal runaway.
    - Battery management/monitoring systems for monitoring and managing the state of battery systems including shutdown if any of the voltage, current, or temperature changes are out of limit.
    - Systems to prevent heat/fire spread within battery containers (such as thermal barriers, shut-down separators, isolation systems, cooling systems).
    - Detection systems for smoke, heat (thermal), fire and toxic gas (off-gassing) within battery containers.
    - Appropriate suppression systems for fire within battery containers.
    - Systems to prevent explosion within battery containers by safely ventilating the system in a controlled manner to reduce the flammability of the atmosphere, such as ventilation, pressure relief and exhaust systems, including incorporation of adequate explosion prevention protection, where applicable.
    - Warning and alarm systems within the battery containers, and/or the facility, to enable early warning for faults, operation of the battery energy storage system above 'normal'/safe parameters, smoke, off-gassing, and fire.
    - Consideration of direct alarm monitoring to the fire brigade for BESS automatic detection systems
    - Provide suitable ember protection (e.g. BAL-12.5 construction) to prevent embers from penetrating battery containers/enclosures including, but not limited to:
        - Battery enclosures via any external walls/roofs (if not completely sealed) and gas ventilation inlets/outlets.
        - Thermal management system (chiller) inlets and outlets

        - Any unsealed penetrations are to be appropriately sealed (with non-combustible material) or gaps/openings (>2mm) are to be screened with non-combustible (aluminium, steel, bronze) screening with maximum aperture <2mm.
    - BESS installation is on a non-combustible surface (e.g. concrete)
    - Where relevant and appropriate to the type of BESS installed, consider adopting:
        - Current versions of UL 9540 or FM Global Property Loss Prevention Data Sheet 5-33, for the design and operation of BESS's.

3.4.2 Solar PV System

- Ensure the following elements are included in the solar panel array design and layout:
    - Solar energy facilities are to have a minimum six (6) metre separation, as follows, and has compliant vehicular access:
        - between solar panel banks (i.e. a bank of solar panels connected to a single power conversion unit/inverter), or
        - so that no unbroken area of solar panels is greater than 25ha.
    - The panel mounting posts will also be on-combustible (likely steel), so will not contribute to the fuel load or support fire
    - Cabling is either designed to be below-ground or installed as high as practical above-ground.
- Ensure inverters are designed to minimise fire risk and is provided with required separation from adjacent infrastructure and the combustible vegetation, in accordance with relevant Australian Standards and manufacturers recommendations.

3.5 Bushfire resilient construction

- Bushfire construction provisions of the National Construction Code require that buildings comply with the AS 3959 construction requirements, in accordance with the assessed BAL under AS 3959, provided the building is a Class 1, 2, 3 or associated Class 10a building/deck, or a "certain Class 9" building.
    - The renewable energy infrastructure (BESS, solar PV, substation) will not be any of the classifications nominated above, therefore in accordance with the National Construction Code, and as such, there is no statutory requirement to meet the construction requirements of AS 3959.
- As detailed in Section 3.4.1, BESS construction is to comply with the CFA Guidelines and incorporate the following:
    - Container construction is to be non-combustible material (e.g. metal).
    - Ember protection is to be provided to parts of the BESS container, in accordance with AS 3959 BAL-12.5 specifications

3.6 Renewable Energy Infrastructure Construction and Commissioning

- Ensure an emergency communication system must be provided that is reliable and will operate in the event of power failure
- Ensure all electrical equipment (e.g. electrical cabling, junction boxes, inverters and transformers) must comply with relevant design, construction and installation standards of electrical equipment including relevant Australian Standards, and manufacturers recommendations.
- Install and commission fire detection, alarm and suppression systems at the earliest possible stage of construction.

- Provide first response firefighting equipment (e.g. extinguishers) at all construction portables/buildings onsite, in the vicinity of all construction activities, and in site-based vehicles.
- Provide mobile fire trailer (or similar approved) prior to commissioning of the renewable energy infrastructure.
- Ensure sufficient training provided to relevant personnel on the use of on-site firefighting equipment and first-aid, and responsibilities during emergencies
- Provide required fire protection equipment for Dangerous Goods as per relevant Australian Standards.
- Ensure tight ignition source control, including hot works and restriction of smoking to prescribed areas.
- Conduct any required vegetation management.
- Undertake all required infrastructure, equipment and vehicle maintenance.
- Incorporate emergency management procedures into the Construction Management Plan (or other relevant document) for the construction and commissioning phase of the facility, adopting similar concepts to those in Section 3.10, for the operational BESS facility, which includes:
    - Adhere to restrictions and guidance during days of Fire Danger Rating of High to Catastrophic, and Total Fire Ban days and Harvest Movement Ban days
    - Regularly monitor for, and otherwise be aware of, bushfires in the local area, and evacuate offsite prior to bushfire impact onsite.
    - Emergency procedures for identified risks and hazards of the renewable energy infrastructure, including but not limited to
        - Bushfires
        - Onsite fire in renewable energy infrastructure (e.g. electrical infrastructure faults and fire in BESS or substation)
    - Ensure the response for any onsite fire or bushfire is the immediate notification of DFES.
    - The priority response action for a bushfire is immediate evacuation of all onsite personnel to offsite safer location (away from bushfire) ahead of bushfire impact on the site, and before bushfire impact (including smoke) on the vehicular access network to the offsite location.
- Notification of fire brigade at least seven days prior to the commissioning of any renewable energy infrastructure at the facility, especially the BESS units.
- Engage with fire brigade to offer a familiarisation visit prior to commissioning, as detailed in Section 3.9.

3.7 Renewable Energy Infrastructure Operation, Maintenance and Housekeeping

- Ensure ongoing compliance with the endorsed BMP and BRMP is achieved, especially prior to, and during, bushfire season. This includes all vegetation management, internal road access, fire system and firewater obligations.
- Ensure any Dangerous Goods (if any) comply with all relevant legislation, Australian Standards and the requirements of the BMP.
- Develop, implement and review the Emergency Information Book and/or signage is appropriately stored at all nominated site entrances, and reviewed on an annual basis (see Section 3.8).

- Develop, implement and review the Emergency Management Plan including all preparedness, pre-emptive and response actions, as required, and ensure ongoing liaison with DFES and regular staff training and exercises are conducted (see Section 3.10 below).
- Ensure inspection, maintenance and any required repair activities are conducted for all renewable energy infrastructure, associated equipment, fire systems, communication systems, and vehicles at the facility, in line with relevant Australian Standards and manufacturers requirements.

3.8 Emergency Information Book and Signage

An Emergency Information Book and/or signage must be located at the nominated site entrance to the facility, with any plans or information books provided in a weatherproof container (unless otherwise agreed with DFES).

The Emergency Information Book and/or signage is intended to provide to emergency responders with an overview of the facility. This information should be developed in liaison with relevant emergency services representatives (if possible) and should seek to include the following:

- A description of the premises, its infrastructure and operations.
- Up-to-date contact details for site personnel, regulatory authorities and site neighbours.
- Site plans that depict the entire site layout, including:
    - Buildings, substations and renewable energy infrastructure (including BESS units),
    - Internal roads and surrounding public roads
    - Fire protection systems and equipment, including firewater tanks
    - Grid connections, drains and isolation valves,
    - Dangerous goods storage areas
    - Neighbours and
    - North direction and scale
- The following BESS details and plans
    - Schematics and technical data for BESS units, the number of units on-site, and the number of battery racks or modules within each unit.
    - Details of the hazards for the BESS, including thermal events/runaway, electrical safety hazards, explosion hazards, dangerous goods hazards (including off-gassing), and the effects of fire on the BESS (eg., explosion, release of toxic gases).
    - Details of all provided battery failure/safety and protective systems, including a description, the activation process/automatic trigger, and any hazards associated with these systems.
    - Specifications for safe operating conditions for temperature.
    - Details of the elements monitored/controlled by the Battery Management System (BMS), including internal temperature, state of charge, voltage, etc. and the locations this information is available.
    - The shutdown and/or isolation procedures if the BESS are involved in fire or emergency incident, and appropriate personnel contact details for verifying that the battery enclosure/container system has been isolated/shutdown and de-energised during emergencies.
- The following solar PV system details and information:
    - Specifications for safe operating conditions for temperature, and the hazards related to electricity generation at the facility.

  - Emergency procedures for isolation and shutdown where solar panels and/or related infrastructure are involved in fire.
  - Emergency procedures for fires within the vicinity of solar energy facilities.
- Details of any emergency equipment, including the type and location of fire and gas detection systems.
- A manifest of dangerous goods (if required) and Safety Data Sheets (SDS) for dangerous goods stored on-site.
- Procedures for the management of emergencies, including evacuation, shelter-in-place (for facilities at risk of bushfire), containment of spills and leaks, and fire procedures (including infrastructure/plant fires, vehicle fires, bushfire).

A review of the information contained within the facility's Emergency Information Book and signage must be undertaken prior to commencement of bushfire season annually.

3.9 Emergency Services Familiarisation

Prior to commissioning of the facility, a familiarisation visit and explanation of the proposed facility, the specific hazards, the proposed fire safety systems and management measures, and the emergency procedures, is to be offered to local fire brigades and other emergency services.

The opportunity should be taken to ensure that the information in the proposed Emergency Information Book/Signage (see Section 3.8) is appropriate for their needs, and that they are familiar with where this will be located.

Additionally, it should be confirmed that any required keys or access codes to any secured parts of the site have been (or will be) supplied to the relevant fire brigade personnel.

A schedule for ongoing site familiarisation to account for changing personnel, facility infrastructure and hazards, and emergency exercises should be developed in conjunction with the local fire brigade.

3.10 Emergency Management Plan

An Emergency Management Plan is to be developed for the facility, which comprehensively details the following (noting this plan it to be for all emergencies and not specifically just to bushfire risk management):

- Facility details including technical support during an emergency, details of emergency resources and a manifest of dangerous goods.
- The identified risks and hazards associated with the:
  - BESS including Li-ion batteries and related infrastructure.
  - Solar PV panels and Inverter Stations
- Detail preparedness and pre-emptive actions to address the above hazards, including the following for bushfire:
  - Ongoing compliance with the approved BMP and BRMP, including ensuring regular vegetation management requirements are achieved, vehicular access routes and firewater systems are maintained and available, and conducting regular bushfire housekeeping inspections.
  - Ensuring ongoing maintenance of all fire and communication systems.
  - Determining forecast Fire Danger Rating Total Fire Bans (TFB) and Harvest Vehicle Movement Bans (HVMB), during bushfire season

- Modifying Site Activities (based on Forecast FDR and TFB/HVMB) including limiting activities which may introduce bushfire ignition (hot works, unnecessary vehicle movement etc).
- Monitoring DFES Bushfire Emergency Warnings (and/or bushfire activity within 50 km of the facility, during bushfire season, and the decision-making triggers

- Detail emergency response procedures to address the nominated hazards.
- For a bushfire emergency, the response should include the following:
  - The immediate response to any onsite bushfire, or bushfire observed in the local area, is to notify DFES and local fire brigade immediately.
  - Conducting early offsite evacuation of all staff away from the bushfire if safe to do so (preferred response), ideally to Eneabba, Three Springs or Carnamah townsite may also be considered in order to travel away from approaching bushfire.
    - Essential staff should only remain onsite if directed by authorised DFES/local fire brigade personnel.
  - If safe to do so prior to staff evacuation:
    - Reduce the facility to a low energy state (including discharging the BESS), in consultation with authorised DFES personnel (where possible)
    - Ensure all other buildings and plant are properly secured.
    - Ensure all vehicular access routes are open and available for use.
    - Ensure all fire and communications systems are ready for use.
  - If there is insufficient time to safely travel offsite without being impacted by bushfire, conduct onsite shelter in place in the O&M building.
    - <u>It is noted that this building is not constructed for onsite refuge from bushfire and should only be considered as a last resort option only if offsite evacuation is not possible.</u>
- Response to onsite fire, including thermal runaway at the BESS, is to include:
  - Immediately notify DFES to enable a rapid turnout
  - Strongly consider full emergency shutdown of the BESS and substation unless there are mitigating circumstances. This should be conducted in consultation with authorised DFES personnel (where possible).
  - If fire is within the BESS unit/s, ensure staff relocate as far as possible from the fire, and no less than 50 m away.
  - If fire is not in the BESS (e.g. in solar farm), and it is safe to do so, trained personnel to conduct first attack response on any spot fires with mobile fire trailer, until DFES arrival.
  - Notify neighbouring landowners.

The emergency management plan is to be reviewed regularly and the relevant staff will need appropriate training and to conduct regular exercises to ensure everyone is fully conversant with the requirements of the plan and able to respond as required during all emergencies. Training should be conducted annually prior to bushfire season, and regular exercises conducted throughout the year.

Further specific detail on the requirements of the emergency management plan is provided in Section 5.8 and Appendix 9 of the project BMP.

3.11 Bushfire Management Measures for Proposed Buildings (from Project BMP)

In addition to the measures detailed above for the renewable energy infrastructure, it is noted that

the project BMP requires the following measures to be incorporated into the design to address bushfire risk to the proposed habitable buildings to comply with SPP 3.7 and the WA Guidelines:

- The O&M building, Storage/Maintenance building and Storage/Warehouse building are all to have compliant 10 m wide APZ to achieve BAL-29 or lower, containing no other buildings or infrastructure.
    - The APZ width has been nominated to ensure this building is sited at least 10 m from proposed BESS units or other renewable energy infrastructure.
- Several buildings are associated with the substation (e.g. switchroom/control room, NSP building) will have a compliant 10 m wide APZ to achieve BAL-29 or lower on these buildings.
- The firewater tank/s will have a compliant 10 m wide APZ to achieve BAL-29 or lower, containing no other buildings or infrastructure.
    - The 10 m APZ has been nominated to ensure these tanks are no closer than 10 m to the BESS units or other renewable energy infrastructure.
- Vehicular access to the buildings and associated firewater tank/s, is to be compliant with the private driveway standards from the WA Guidelines including:
    - If less than 6m wide, shall have 6 m wide by 20 m long passing bays every 200 m
    - Has compliant turnaround or loop road access, within 30 m of building/s.
    - Provides access to within 4 m of the firewater tank suction.
- The capacity of the firewater tanks for the buildings is to be at least 10 kL per building, which can either be standalone tanks, or added to the capacity required for the renewable energy infrastructure as per the CFA Guidelines.
    - All firewater tank/s are to comply with WA Guidelines specifications, and be sited in BAL-29 or lower.
- No specific bushfire construction required for buildings as per National Construction Code given they are not Class 1, 2, 3, associated Class 10a or a “certain Class 9”.

4.0 CFA Guidelines Compliance Assessment

As detailed previously, the project is applying the Model Requirements from the CFA Guidelines to the renewable energy infrastructure of the project as much as possible as part of the bushfire risk management strategy, albeit rationalised for a WA context where required (e.g use of WA standards for APZs, roads, firewater tanks etc).

The proposed bushfire management strategy and mitigation measures have been detailed above in Section 3.0, with a compliance assessment of these measures against the Model Requirements of the CFA Guidelines provided below in Table 1.

The assessment demonstrates that compliance has been achieved with all Model Requirements, other than some rationalisations for the WA context. As previously noted, not all Model Requirements relate to bushfire impact on the proposed development, however the management of many of these internal hazards is also critical to avoid ignition of bushfires, so have been discussed as much as relevant.

Table 1: Summary of Renewable Energy Facility requirements relating to bushfire and the development response (CFA, 2023)

CFA Guideline Section	Requirement	Type	Development Response
Section 2: Consultation	***Consulting with CFA*** • Early consultation with DFES, before developing a planning permit application.	***All Facilities***	• The Proponent conducted a meeting with DFES on 24 March 2025 to detail the proposed bushfire risk management strategy ○ The meeting included DFES personnel from Land Use Planning and HAZMAT/Special Risks. • Further consultation expected to be undertaken during the planning and building approval process.
Section 3: Fire Risk Management	***Risk Management Plan*** • A Risk Management Plan must be developed for the facility, before development starts. *Additional Guidance from CFA Guidelines* • A Risk Management Plan (RMP) is critical in informing fire risk management in the design and operation of facilities, particularly where infrastructure or operations pose additional hazards to the landscape, occupants and emergency responders.	***All Facilities***	• This Bushfire Risk Management Plan assesses the bushfire hazards and risks for the proposed renewable energy infrastructure against the requirements of the CFA Guidelines, and details how the risk has been appropriately managed. • The required mitigation measures for the renewable energy infrastructure, has been incorporated into the project Bushfire Management Plan, to ensure they are implemented and maintained for the life of the project. • ***Based on the above, all requirements with the CFA Guidelines have been met.***

Section 4: Facility Location	***Landscape Risk to Facility***
	• An assessment that considers:
	  ○ The impact of any ignitions arising from the infrastructure on nearby communities, infrastructure and assets.
	  ○ The impact of bushfire on the infrastructure (e.g. ember attack, radiant heat impact, flame contact).
		All Facilities	• The proposed development is largely within existing grazed land, and has a plot of retained low scrub vegetation within the eastern portion of the site, and minor grassland in the transmission line corridor. Outside the proposed development is grassland immediately to the north, with low scrub and minor woodland surrounding the site on the other sides.
			• As detailed in Sections 2.3, while bushfires have historically been a regular occurrence in the local region, especially in areas of retained vegetation, few have occurred in grassland or spread into the project area. Any bushfire impact on the facility is likely to the be from low scrub or grassfire with quick residence time (10 seconds to 1 minute), noting that the BESS facility is exposed only to grassland to the north. There potential for some minor ember attack on the facility from scrub and woodland vegetation.
			• The focus on addressing landscape risk of bushfire to the facility, is primarily through the provision of the following:
			  ○ Onsite vegetation management, including NVZ/APZs around renewable energy infrastructure, to reduce bushfire impact to moderate levels, especially on the basis that the BESS containers and solar panels are largely non-combustible materials and the anticipated bushfire behaviour will be a rapid grassfire with limited residence time.
			  ▪ The sizing of the NVZ/APZ is commensurate with the surrounding bushfire hazard (i.e. increasing in width to provide more separation from the hazard where it presents greater potential for significant bushfire behaviour), and the resilience of the renewable energy infrastructure.
			  ▪ The BESS units are more susceptible to elevated heat which could potentially trigger thermal runaway, and on this basis, the NVZ/APZ has been sized to achieve a target of BAL-12.5, but with a minimum width of 25 m to address any explosion risk.
			  ▪ The remainder of the renewable energy infrastructure (solar panels, inverter stations, substation etc) has greater resilience to bushfire and as such, the NVZ/APZ has been sized to achieve a target of BAL-29.
			  ○ Vehicular access and firewater requirements for the renewable energy infrastructure have been determined through application of the CFA Guidelines and provide significant resources for attending firefighters to fight bushfires approaching the site, and also fire within the facility:
			  ▪ The internal road network enables attending firefighters to access all proposed BESS and solar infrastructure, and the substation, including the provision of multiple entrances to the site and the use of loop perimeter roads.
			  ▪ The onsite firewater supplies, provide a significant quantity of firewater for attending firefighters to refill appliances, without extended travel time.
			  ○ The BESS containers are designed to incorporate bushfire resilience through non-combustible construction and targeted ember protection. Additionally, the BESS units are designed with a number of fire and safety systems to limit the potential for thermal runaway, fire and explosion from the unit, including
			  ▪ Battery management/monitoring systems
			  ▪ Thermal management/monitoring systems
			  ▪ Fire detection, alarm and suppression systems
			  ▪ Explosion management systems

CFA Guideline Section	Requirement	Type	Development Response
			○ System monitoring for all electrical infrastructure must be provided, especially the BESS unit BMS and fire/gas detection, to ensure that any electrical or equipment failures with the potential to ignite or propagate fire are rapidly identified and relevant site personnel notified to enable early fire brigade notification. ○ Strong liaison with DFES and local fire brigade from facility commissioning and for the duration of operation ○ Emergency Management Plan that addresses bushfire preparedness, prevention and response activities, including notification of DFES, facility shutdown and offsite evacuation. • ***Based on the above, all requirements with the CFA Guidelines have been met.***
	Facility Risk to Landscape • As assessment of the fire risk from the proposed facility to the landscape	***All Facilities***	• As detailed in Sections 2.4.1.2, 2.4.1.5 and 2.4.2.1, based on historical occurrences in Australia, there appears to be a relatively low likelihood of BESS and solar PV fires. It is noted that these type of grid scale BESS and solar facilities are also relatively new, therefore the opportunity for fire damage and loss is limited. BESS fires in Australian appear to have generally been contained to 1 or 2 BESS units, with limited spread across adjacent BESS. • The focus on addressing risk to the landscape is primarily through prevention of uncontrolled BESS fire and explosion ,or solar PV or inverter fire, in order to prevent fire spread to vegetation, through the provision of the following: ○ The BESS containers are designed to incorporate bushfire resilience through non-combustible construction and targeted ember protection. Additionally, the BESS units are designed with a number of fire and safety systems to limit the potential for thermal runaway, fire and explosion from the unit, including ▪ Battery management/monitoring systems ▪ Thermal management/monitoring systems ▪ Fire detection, alarm and suppression systems ▪ Explosion management systems ○ Appropriate separation of renewable energy infrastructure (in particular BESS units) to avoid spread of fire between infrastructure. ○ System monitoring for all electrical infrastructure must be provided, especially the BESS unit BMS and fire/gas detection, to ensure that any electrical or equipment failures with the potential to ignite or propagate fire are rapidly identified and relevant site personnel notified to enable early fire brigade notification. ○ Onsite vegetation management, including NVZ/APZs around renewable energy infrastructure, to limit the ability of onsite fire in the renewable energy infrastructure to escape to surrounding unmanaged vegetation. ○ Vehicular access and firewater requirements for the renewable energy infrastructure have been determined through application of the CFA Guidelines and provide significant resources for attending firefighters to fight fire within the facility: ▪ The internal road network enables attending firefighters to access all proposed BESS and solar infrastructure, and the substation, including the provision of multiple entrances to the site and the use of loop perimeter roads. ▪ The onsite firewater supplies, provide a significant quantity of firewater for attending firefighters to control or suppress onsite fires. ○ Strong liaison with DFES and local fire brigade from facility commissioning and for the duration of operation ○ Emergency Management Plan that addresses bushfire preparedness, prevention and response activities, including notification of DFES, facility shutdown and offsite evacuation. • ***Based on the above, all requirements with the CFA Guidelines have been met.***
Section 4: Facility Design	***Non-Vegetated Zones (NVZ) and Asset Protection Zones (NVZ)*** • The provision of NVZ and/or APZ that reduces the potential for fire to enter or leave an area: ○ Around the perimeter of control rooms, electricity compounds, substations and all other buildings onsite. ○ Of a width of at least 10m, and at least the distance where radiant heat flux (output) from the vegetation does not create the potential for ignition of on-site infrastructure • A NVZ must be: ○ Non-combustible, constructed of concrete, mineral earth or non-combustible mulch such as crushed rock.	***All Facilities*** ***BESS***	• Vegetation modification and management requirements for the renewable energy infrastructure has been determined through application of the CFA Guidelines and detailed in Section 3.1 of this BRMP. ○ The BESS units are to have a 25 m wide perimeter NVZ/APZ to achieve BAL-12.5 or lower and address any explosion risk for bushfire ignitions, consisting of the following: ▪ A 10 m wide NVZ adjacent to the BESS units, that is non-combustible (constructed of concrete, mineral earth or non-combustible mulch etc) and free of vegetation and obstructions at all times, with no plant or equipment unless totally non-combustible. ▪ Outside the 10 m NVZ, the remaining 15 m can be non-vegetated or otherwise comply with the APZ standards from the WA Guidelines, with the following clarifications: • Have no trees located close enough to BESS's such that any falling branches or trees could

CFA Guideline Section	Requirement	Type	Development Response
	○ Free of vegetation and obstructions at all times. ○ No plant or equipment of any kind is to be stored in fire breaks. *Additional Requirements for BESS* • The provision of a NVZ and/or APZ around battery energy storage systems and related infrastructure.		mechanically damage the BESS • Largely consist of managed grassland (<100 mm in height) or low groundcovers ○ The substation/switchyard is to have an 10 m wide perimeter NVZ/APZ to achieve no less than BAL-29. ▪ In order to limit the chance of electrical faults in the substation from igniting a bushfire, all within the substation NNVZ/APZ consisting entirely of non-vegetated elements. ○ All land within the BESS NVZ/APZ is to be non-combustible (constructed of concrete, mineral earth or non-combustible mulch etc) and free of vegetation and obstructions at all times, with no plant or equipment unless totally non-combustible. ○ A 10 m – 15 m wide NVZ/APZ, is to be established around the perimeter of the solar panel arrays and inverter station envelopes, to achieve BAL-29 or lower on this infrastructure. ▪ Ideally this would be non-combustible as much as practical, or otherwise compliant with the APZ standards (e.g. slashed grass), with no plant or equipment unless non-combustible. ○ Within the perimeter solar panel APZs, all vegetation beneath the solar panels and around inverter station is to be managed to limit the potential for ignition and spread of fire from an electrical fault, or damage to panels from an external bushfire. ▪ Ideally this would be kept in a non-vegetated state, however slashed grass as per the APZ standards during bushfire season is also sufficient. • These vegetation modification and management requirements have been incorporated into Section 5.1 of the project BMP, which are to be maintained in perpetuity (or for the life of the facility). • ***Based on the above, the requirements with the CFA Guidelines have been met.***
	Emergency Vehicle Access • Construction of a minimum four (4) metre perimeter road within the perimeter fire break. • Roads must be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tonnes (e.g., no compacted earth). • Constructed roads should: ○ Be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for the width of the formed road surface. ○ Incorporate passing bays at least every 600 metres, which must be at least twenty (20) metres long and have a minimum trafficable width of six (6) metres. Where roads are less than 600 metres long, at least one passing bay must be incorporated. ○ Otherwise comply with the private driveway specifications of the WA bushfire Guidelines ○ Ensure any fencing along access routes allows for width of fire trucks. • Road networks must enable responding emergency services to access all areas of the facility, including fire service infrastructure, buildings, and related renewable energy infrastructure. • The provision of at least two (2) but preferably more access points to each part of the facility. *Additional Requirements for BESS* • The provision of at least two access points into each section where battery energy storage systems are located. *Additional Requirements for Solar Facilities (>5MW)* • The provision of at least two access points into each non-adjoining area of the facility over 5 MW (e.g. a main access point and an emergency access point in each fenced area).	***All Facilities*** ***BESS*** ***Solar***	• Vehicular access requirements for the renewable energy infrastructure have been determined through application of the CFA Guidelines and detailed in Section 3.2 of this BRMP. ○ At least 2 site entrances are to be provided to the facility from Turkey Flat Road into the development ○ At least 2 entrance/exit gates are to be provided to the BESS yard, and the internal road to be configured as loop road, to avoid creation of any internal dead-end roads. ○ The internal road network around the solar PV arrays is to be configured as loop roads, also avoiding creation of any internal dead-end roads, and will ensure at least 2 access points to each part of the facility. ○ To align with local expectations, the internal road specifications are to comply with the private driveway specifications of the WA Guidelines, rather than the CFA Guidelines from Victoria. • These vehicular access requirements have been incorporated into Section 5.2 of the project BMP. • ***Based on the above, the requirements of CFA Guidelines have been met, albeit adopting the internal road specifications from the WA Guidelines.***
	Firefighting Water Supply • Water access points must be clearly identifiable and unobstructed to ensure efficient access. • Static water storage tank installations must comply with relevant Australian Standards (including AS 2419.1) and the technical requirements of the WA bushfire Guidelines: ○ The static water storage tank(s) must be an aboveground water tank constructed of concrete or steel. ○ An external water level indicator must be provided to the tank and be visible from the hardstand area. ○ Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank.	***All Facilities*** ***BESS*** ***Solar***	• The CFA Guidelines broadly require that that firewater supply for BESS facilities in areas where reticulated water is unavailable, is to be 288,000L or more, or as per the provisions for Open Yard Protection of AS 2419.1-2021, flowing for a period of no less than four hours at 20L/s, whichever is the greater • The Proponent has been advised that manufacturers are typically not recommending use of firewater on BESS fires, and it appears that evidence from recent BESS fires (e.g. Bouldercombe) that the firefighting response may be evolving toward this practice. • Firefighting water supply for proposed BESS units is to comply with the requirements of CFA Guidelines for BESS facilities in areas without reticulated water supply as follows (unless agreed otherwise with DFES as detailed below):

CFA Guideline Section	Requirement	Type	Development Response
	○ Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest static water tank(s). • The static water storage tank(s) must be capable of being completely refilled automatically or manually within 24 hours. • The static water storage tanks must be located at vehicle access points to the facility and must be positioned at least ten (10) metres from any infrastructure • The hard-suction point must be provided with a 150mm full bore isolation valve equipped with a Storz connection (or approved alternative), sized to comply with the required suction hydraulic performance. ○ The hard-suction point must be protected from mechanical damage where necessary. ○ The hard-suction point must be positioned within four (4) metres to a road or hardstand area and provide a clear access for emergency services personnel. • An all-weather road access and hardstand, compliant with the private driveway specifications of the WA bushfire Guidelines and at least 6 m wide and 8 m long, must be provided to the hard-suction point. ○ The road access and hardstand must be kept clear at all times. • Where the access road has one entrance, an 18 m diameter turning circle must be provided at the tank. *Additional Requirements for BESS (Centralised)* • Where reticulated water is available, the provision of a fire hydrant system that meets the requirements of AS 2419.1-2021 Clause 3.9: Open Yard Protection, and Table 2.2.5(D): Number of Fire Hydrants Required to Flow Simultaneously - Open Yards. OR • Where no reticulated water is available, provision of a fire water supply in static storage tanks, where: ○ The fire water supply must be of a quantity no less than 288,000L or as per the provisions for Open Yard Protection of AS 2419.1-2021, flowing for a period of no less than four hours at 20L/s, whichever is the greater. ○ The quantity of static fire water storage is to be calculated from the number of hydrants required to flow from AS 2419.1-2021: Fire hydrant installations, Table 2.2.5(D). ○ Fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet. ○ The fire water supply must be located at vehicle entrances to the facility, at least 10m from any renewable energy infrastructure and buildings. ○ The fire water supply must be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency. (e.g. Fire water tanks are to be located closer to the site entrance that the battery energy storage system). • The fire water supply must comply with relevant Australian Standards (including AS 2419.1) and the technical requirements of the WA Guidelines *Additional Requirements for Solar Facilities (>5MW)* • The provision of fire water tanks of at least 45,000L at the primary vehicle entrance to each part of the facility. • The provision of additional fire water tanks of at least 45,000L effective capacity for every additional 100ha (after the initial 100ha).		○ ***While compliance with the CFA Guidelines is stated as a requirement of this BMP as detailed below, it is also noted that the CFA Guidelines may lag current BESS firefighting practice requiring less use of firewater, and on this basis, should DFES and the Proponent review the firewater system requirements and agree to a rationalised system or firewater capacity in line with current BESS firefighting responses, then this BMP would view this as an acceptable deviation from the CFA Guidelines.*** • Firefighting water supply for the proposed solar PV arrays is to be provided in accordance with CFA Guidelines, with a 45 kL firewater tank to be provided for every 100 ha of solar panels. ○ This is currently expected to be 5-6 tanks, with at least one located near the main entrance. • Given the substantial amount of firewater required, no additional capacity is proposed for bushfire fighting purposes (other than the 10 kL per building required to comply with the WA Guidelines as detailed in Section 5.3.1). • The firewater requirements are detailed in Section 3.3 of this BRMP and Section 5.3.2 of the BMP. • ***Based on the above, while the final capacity of the tanks is yet to be confirmed (and will be done in consultation with DFES), all other requirements with the CFA Guidelines capable of being met.***
	Fire Detection and Suppression Equipment • Suitable fire detection and suppression equipment must be provided: ○ For on-site buildings and structures, according to the requirements of the National Construction Code. ○ For storages of Dangerous Goods, according to the requirements of any Australian Standards for the storage and handling of Dangerous Goods. ○ For electrical installations, a minimum of two suitable fire extinguishers must be provided within 3m-20m of each PCU. ○ In all vehicles and heavy equipment, each vehicle must carry at least a nine (9)-litre water stored pressure fire extinguisher with a minimum rating of 3A, or other firefighting equipment as a minimum	***All Facilities***	***National Construction Code (NCC) compliance*** • All buildings are to comply with the fire detection and suppression requirements of the NCC. • As detailed in Section 3.5 of the BRMP, from a bushfire construction perspective, the NCC requires additional resilience to be added to Class 1, 2, 3, associated 10a and “certain” Class 9 buildings. ○ None of these building classifications are proposed at the facility, however the Proponent may consider voluntary adoption of bushfire construction measures to some buildings. • As detailed in Section 3.4.1 of the BRMP, BESS container construction is to comply with the CFA Guidelines and incorporate the following: ○ Container construction is to be non-combustible material (e.g. metal).

CFA Guideline Section	Requirement	Type	Development Response
	when on-site during the Fire Danger Period.		○ Ember protection is to be provided, in accordance with AS 3959 BAL-12.5 specifications) ***Dangerous Goods compliance*** • The proposed BESS units will contain Li-ion batteries (or similar) that will be classified as Dangerous Goods. ○ This BRMP demonstrate the bushfire risk management measures comply with that of the CFA Guidelines, including reviewing and assessing the potential risk to and from the BESS units. ○ Notwithstanding, these Dangerous Goods will also need to comply with all relevant Dangerous Goods legislation, codes and standards. • Additionally, should significant quantities of dangerous goods (other than the BESS batteries) be stored or handled onsite: ○ These will also need to comply with all relevant Dangerous Goods legislation, codes and standards ○ They should be reviewed by a BPAD Level 3 bushfire practitioner to ensure they are sited in areas of BAL-29 or lower, and appropriately protected from bushfire impact. ***Portable fire extinguishers*** • Portable fire extinguishers are to be provided in (or near) the following in accordance with Australian Standards and Shell requirements: ○ BESS units ○ Each building ○ Substation rooms (e.g. switchroom/control room) ○ Onsite vehicles • ***Based on the above, all requirements with the CFA Guidelines have been met.***
	Design Specific to Facility Type *Additional Requirements for BESS* • Facility design that incorporates: ○ A separation distance that prevents fire spread between battery containers/enclosures and other site elements. ▪ Separation must be at least the distance where the radiant heat flux (output) from a battery energy storage system container/enclosure fully involved in fire does not create the potential for ignition of these site elements. ○ A NVZ and/or APZ around the battery energy storage system and related infrastructure, of a width of no less than 10m (or greater where determined). ▪ NVZ must be non-combustible, constructed of concrete, mineral earth or non-combustible mulch such as crushed rock. ▪ The width must be calculated based on the ignition source being radiant heat of surrounding vegetation, including landscaping. ○ A layout of site infrastructure that: ▪ Considers the safety of emergency responders. ▪ Minimises the potential for grassfire and/or bushfire to impact the battery energy storage system. ▪ Minimises the potential for fires in battery containers/enclosures to impact on-site and offsite infrastructure. • Battery energy storage systems must be: ○ Located so as to be reasonably adjacent to a site vehicle entrance (suitable for emergency vehicles). ○ Located so that the site entrance and any fire water tanks are not aligned to the prevailing wind direction (therefore least likely to be impacted by smoke in the event of fire at the battery energy storage system.) ○ Provided with in-built fire and gas detection systems. ○ Provided with explosion prevention via sensing and venting, or explosion mitigation through deflagration panels.	***BESS*** ***Solar***	***Separation Distance*** • While outside the bushfire risk management scope, the BESS related siting requirements have been nominated as per the stated CFA Guidelines requirements, in Section 3.1 of this BRMP and Section 5.4.1 of the BMP. ○ The expectation is this will be addressed by complying with relevant codes and standards, including Australian Standards, and any manufacturers recommendations. ***NVZ/APZ around BESS and Related Infrastructure*** • Vegetation modification and management requirements for the renewable energy infrastructure has been determined through application of the CFA Guidelines and detailed in Section 3.1 of this BRMP. • These vegetation modification and management requirements have been incorporated into Section 5.1 of the project BMP, which are to be maintained for the life of the facility. ***BESS and Solar Design Requirements*** • The BESS related design requirements have been nominated as per the stated CFA Guidelines requirements, and summarised in Section 3.4.1 of this BRMP and Section 5.4.1 of the BMP. ***Solar Design Requirements*** • The solar panel separation requirements have been nominated as per the stated CFA Guidelines requirements, and summarised in Section 3.4.2 of this BRMP and Section 5.4.2 of the BMP. • ***Based on the above, all requirements with the CFA Guidelines have been met.***

CFA Guideline Section	Requirement	Type	Development Response
	○ Provided with suitable ember protection. ○ Provided with suitable access roads for emergency services vehicles. ○ Installed on a non-combustible surface. ○ Provided with suitable ventilation. ○ Provided with suitable impact protection. ○ Provided with enclosed wiring and buried cabling, except where required to be above-ground for grid connection. ○ Provided with spill containment that includes provision for management of fire water runoff. • As wind energy facilities pose hazards for aerial firefighting operations in certain weather and terrain *Additional Requirements for Solar Facilities (<5MW)* • Provision of a minimum six (6) metre separation between solar panel banks.		
Section 5: Facility Construction and Commissioning	***Emergency Plan (Construction)*** • An Emergency Plan must be developed for the construction and commissioning phase of the facility. *Additional Guidance from CFA Guidelines* • An emergency communication system must be provided that is reliable and will operate in the event of power failure. • Install and commission fire detection and suppression systems for the facility at the earliest possible stage of construction. • Provide first-aid firefighting equipment, such as fire extinguishers (and where possible, portable fire hose reels), appropriate to the identified emergency scenarios, at all construction portables/buildings onsite, in the vicinity of all construction activities, and in site-based vehicles. • Provide training for personnel in the use of on-site first-aid firefighting equipment, and responsibilities during emergencies. • Provide the required fire protection equipment for any storages of dangerous goods as per the relevant Australian Standards. • It is recommended the development of safe work procedures for the facility, encompassing but not limited to: ○ Electricity and chemical management. ○ Vegetation management. ○ Ignition source control, including hot works. ○ Infrastructure, equipment and vehicle maintenance. ○ Emergency management • Adhere to restrictions on Total Fire Ban or days of elevated fire danger • Restrict smoking to prescribed areas and provide suitable ash and butt disposal facilities. • Fire brigade must be notified at least seven (7) days prior to the commissioning of any high-risk infrastructure at the facility (e.g., battery energy storage systems).	***All Facilities***	• Emergency procedures for the construction phase are to be incorporated in the Construction Management Plan as mentioned in Section 3.6 of this BRMP. • It is recommended that the bushfire emergency management concepts summarised in Section 3.10 of this BRMP and detailed in Section 5.8 of the project BMP for the operational facility, are incorporated into the Construction Management Plan for bushfire preparedness and response, as much as applicable. • Additional bushfire related construction and commissioning requirements for the renewable infrastructure, has been determined through application of the CFA Guidelines and documented in Section 3.6 this BRMP and Section 5.4 of the BMP, including the specific requirement to notify DFES ahead of commissioning any renewable energy infrastructure (e.g. BESS). • ***Based on the above, all requirements with the CFA Guidelines have been met.***
Section 6: Facility Operation	***Fire Management Plan*** • A Fire Management Plan must be developed for the facility, in consultation with fire brigade, before development starts. *Additional Guidance from CFA Guidelines* • A Fire Management Plan is based on the outcomes of the Risk Management Plan and outlines the activities, processes and accountabilities for the ongoing management of fire risk at the facility including: ○ A summary of fire hazards and risks to and from the site, specific to its location, infrastructure, activities and occupancy. ○ Description of control measures to prevent fire occurring and limit the consequences of fire at the facility. ○ Description of control measures to prevent and reduce the consequences of external fire impacting the facility.	***All Facilities***	• The bushfire related siting, design, construction and maintenance requirements for the renewable infrastructure, has been determined through application of the CFA Guidelines and summarised in Section 3.0 of this BRMP. • These bushfire risk management measures for the renewable energy infrastructure have also been summarised in Section 5.0 of the project BMP, including the nomination of responsible entities for implementation and ongoing management. • The additional BESS requirements are captured as ongoing operation, maintenance and housekeeping requirements, and required information to include in the Emergency Information Book for attending firefighters • ***Based on the above, all requirements with the CFA Guidelines have been met.***

CFA Guideline Section	Requirement	Type	Development Response
	○ Details of equipment and resources to manage fire at the facility ○ Policies and procedures that ensure all control measures are appropriate and effective, and remain so. ○ Procedures for review of the Plan *Additional Requirements for BESS* • A Fire Management Plan for a facility that incorporates a battery energy storage system must also include: ○ A schedule, list of activities and accountabilities for the inspecting, testing, monitoring and servicing of the battery and its monitoring, safety and protective systems. ○ Monthly inspections of battery enclosures/ containers and related infrastructure for physical damage. Any damage must be immediately assessed and rectified by a suitably qualified person. ○ Seismic activity as a trigger for inspecting, testing and servicing of the battery energy storage system and its related infrastructure. Any damages or changes in operating parameters must be immediately assessed and rectified by a suitably qualified person. ○ Regular inspection and removal of all combustible materials near the battery enclosures/containers and related infrastructure.		
	Bushfire and Grassfire • If your facility is at-risk of bushfire, prevention and preparedness activities must be detailed in the Fire Management Plan. *Additional Guidance from CFA Guidelines* • Your facility may be at-risk of bushfire if it is: ○ Located in an area close to or amongst dense or open bush, unmanaged grassland, near coastal scrub, or at an urban fringe. ○ Identified as being in a Designated Bushfire Prone Area. • Address bushfire prevention and preparedness activities	***All Facilities***	• Bushfire preparedness and response actions for the renewable energy infrastructure has been determined through application of the CFA Guidelines and documented in Section 3.10 of this BRMP. • These bushfire preparedness and response actions have been incorporated into Section 5.8 of the project BMP. • ***Based on the above, all requirements with the CFA Guidelines have been met.***
	Vegetation Management • Facility operators must undertake the following measures during the nominated bushfire season (as per Local Government firebreak notice): ○ Grass must be maintained at or below 100mm in height during the nominated bushfire season. ○ Long grass and/or deep leaf litter must not be present in areas where heavy equipment will be working, during construction or operation. ○ Restrictions and guidance must be adhered to during the nominated bushfire season, days of High (and above) fire danger and declared Total Fire Ban days *Additional Requirements for BESS* • Containers/enclosures and infrastructure for battery energy storage systems must be maintained to be clear of vegetation, including grass, for at least 10 m on all sides (or greater where determined). *Additional Requirements for Solar Facilities* • Solar energy facilities must have grass maintained to no more than 100mm under solar panels during the Fire Danger Period. • Operators of solar energy facilities on grazed paddocks must ensure that if additional measures to maintain grass to this level are required, they are implemented prior to, and for the duration of the Fire Danger Period.	***All Facilities*** ***BESS*** ***Solar***	• Vegetation modification and management requirements for the renewable energy infrastructure has been determined through application of the CFA Guidelines and detailed in Section 3.1 of this BRMP, and includes: ○ The non-vegetated zone within, and surrounding, the BESS containers ○ The management of grass within, and surrounding, the solar panels • These vegetation modification and management requirements have been incorporated into Section 5.1 of the project BMP, which are to be maintained for the life of the facility. • Compliance with restrictions and guidance on days of elevated Fire Danger Rating, and Total Fire Ban days is summarised in Section 3.10 of this BRMP and expanded upon in Section 5.8 of the BMP • ***Based on the above, all requirements with the CFA Guidelines have been met.***
	Arc Flash Hazard Management *Additional Guidance from CFA Guidelines* • Where required, appropriate demarcation of arc boundaries to at least 10m from PCU arc flash outlet flaps (blow-out panels) must be provided.	***All Facilities***	• While outside the bushfire risk management scope, the Proponent has advised they will comply with relevant arc flash standards. • ***Based on the above, all requirements with the CFA Guidelines have been met.***
	Facility and System Monitoring • Appropriate monitoring for facility infrastructure must be provided, to ensure that any shorts, faults or equipment failures with the potential to ignite or propagate fire are rapidly identified and controlled, and any fire is notified to 000 immediately.	***All Facilities*** ***BESS***	• The proposed facility is to be monitored, both onsite (during business hours) and offsite (at all times) as detailed in Section 3.4 of the BRMP and Section 5.4.4 of the BMP. • The substation functionality is expected to be monitored by the Proponent and/or Western Power. • The following emergency response procedures for an onsite fire (in particular a BESS fire) are included in the

CFA Guideline Section	Requirement	Type	Development Response

	Additional Requirements for BESS
	• For battery energy storage systems, appropriate monitoring and intervention measures must be provided to ensure that the following are rapidly identified and notified to 000 immediately:
	  ○ Any shorts, faults, temperature increases above normal parameters (eg., precursor to thermal events/runaway).
	  ○ Equipment failures with the potential to ignite or propagate fire.
	  ○ Off-gassing, smoke or fire.
	• The provision for direct alarm monitoring to the fire brigade for battery energy storage system automatic detection systems must be considered
			bushfire emergency management arrangements summarised in Section 3.10 of this BRMP and expanded upon in Section 5.8 of the BMP:
			  ○ Immediately notify DFES to enable a rapid turnout
			  ○ If possible, ensure relevant vehicular access routes are open and available, to enable attending firefighters to gain access to the location of the fire.
			  ○ Ensure all fire and communications systems are ready for use.
			  ○ Ensure attending firefighters have access to any relevant specialist technical personnel (onsite or offsite), to assist by providing technical advice.
			  ○ If the fire in in the BESS, ensure no staff approach the BESS (if there are any onsite). Staff should move to safe distance from the project area, no less than 50 m (or as advised).
			  ▪ Strongly consider full emergency shutdown of the BESS and substation unless there are mitigating circumstances. This should be conducted in consultation with authorised DFES personnel (where possible).
			  ○ If fire is not in the BESS (e.g. in solar farm), and it is safe to do so, trained personnel to conduct first attack response on any spot fires with mobile fire trailer , until DFES arrival.
			  ○ Notify neighbouring landowners.
			• ***Based on the above, all requirements with the CFA Guidelines have been met.***

	Maintenance and Housekeeping • Inspection, maintenance and any required repair activities must be conducted for all infrastructure, equipment and vehicles at the facility. • Maintenance must be in line with any relevant Australian Standards, the manufacturer's requirements. • Site-wide housekeeping inspections must be conducted regularly at facility. If your facility is at-risk of bushfire, site-wide bushfire preparedness housekeeping inspections must be conducted at least three months, and again one month, prior to the Fire Danger Period.	***All Facilities***	• The bushfire related siting, design, construction and maintenance requirements for the renewable infrastructure, has been determined through application of the CFA Guidelines and documented in this BRMP, including specific requirements during the operation phase relating to maintenance and housekeeping in Section 3.7. • These bushfire risk management measures for the renewable energy infrastructure, including ongoing maintenance and management requirements, have also been summarised in the project BMP in Section 5, including the nomination of responsible entities for ongoing management on Table 6 of the BMP. • ***Based on the above, all requirements with the CFA Guidelines have been met.***

	Safe Dangerous Goods Storage and Handling
	Additional Guidance from CFA Guidelines
	• Signage and labelling compliant with the Dangerous Goods (Storage and Handling) Regulations 2022 and the relevant Australian Standards must be provided at the site entrance, dangerous goods storage locations, and storage tanks where applicable.
	• Appropriate material for cleaning up dangerous goods spills and leaks (including absorbent, neutralisers, tools, disposal containers and personal protective equipment) must be provided and available on-site.
	• Training must be provided for site personnel on the hazards, safe use and emergency response for spills, leaks and fire involving dangerous goods.
	• All dangerous goods stored on-site must have a current Safety Data Sheet (SDS). Safety Data Sheets must be provided within the facility's Emergency Information Book(s), in the Emergency Information Container(s).
	• The requirements of the dangerous goods legislative framework, and all relevant Australian Standards must be complied with for all facilities, including facilities with battery energy storage systems.
		All Facilities	• The proposed BESS units will contain Li-ion batteries (or similar) that will be classified as Dangerous Goods.
			  ○ This BRMP demonstrate the bushfire risk management measures comply with that of the CFA Guidelines, including reviewing and assessing the potential risk to and from the BESS units.
			  ○ Notwithstanding, these Dangerous Goods will also need to comply with all relevant Dangerous Goods legislation, codes and standards.
			• Additionally, should significant quantities of dangerous goods (other than the BESS batteries) be stored or handled onsite:
			  ○ These will also need to comply with all relevant Dangerous Goods legislation, codes and standards
			  ○ They should be reviewed by a BPAD Level 3 bushfire practitioner to ensure they are sited in areas of BAL-29 or lower, and appropriately protected from bushfire impact.
			• The Emergency Information Book is to contain a current manifest of dangerous goods (if required) and Safety Data Sheets (SDS) for Dangerous Goods stored on-site.
			• ***Based on the above, all requirements with the CFA Guidelines have been met.***

	Fire Risk Review
	Additional Guidance from CFA Guidelines
	• Fire risk must be effectively managed at operating facilities to meet obligations for providing a safe workplace under the OHS Act.
	• Fire brigade recommends that facility operators consider the design guidelines and model requirements contained in this document and develop procedures to ensure that:
	  ○ The Fire Management Plan is reviewed and updated regularly, in line with any reviews and changes to hazards and risk management as per the Risk Management Plan, and where there is a near-miss or incident at the facility.
	  ○ The Emergency Plan is reviewed and updated to reflect any changes in the Fire Management Plan,
		All Facilities	• Like any BMP or BRMP, if there are significant changes to the development, they should be reviewed, and if required amended, to reflect those changes.
			• The Emergency Management Plan for the facility is to be reviewed and amended as summarised in Section 3.10 of the BRMP and Section 5.8 of the project BMP.
			• ***Based on the above, all requirements with the CFA Guidelines have been met.***

CFA Guideline Section	Requirement	Type	Development Response
	including where fire risks emerge or change, risk controls are added or modified, or where there is a near miss or incident at the facility. • Where substantive changes are made to these documents, fire brigade recommends considering peer-review by a suitably qualified, independent third party.		
Section 7: Emergency Planning	***Emergency Plan (Operational)*** • An Emergency Plan must be developed for the operational phase, specific to the facility, before development starts. *Additional Guidance from CFA Guidelines* • An Emergency Plan (EP) details the arrangements for managing emergencies, including the facility details, structures, procedures, resources and training. EP's must be specific to the infrastructure, operations and location of facilities, and informed by a sound risk management process. • The EP should address the following for each hazard: o Emergency Response Procedures (including evacuation or onsite shelter-in-place as required) o Personnel Training o Emergency Exercises • The EP is a 'living document' that must be regularly reviewed to ensure their currency and effectiveness. *Additional Requirements for BESS* • Emergency Plans for facilities with battery energy storage systems must additionally include: o Contact information for 24/7/365 specialist technical support for the battery energy storage system. o Emergency response procedures based on identified risks and hazards of the battery energy storage system and related infrastructure, including but not limited to: ▪ Electrical infrastructure faults and fire. ▪ Battery energy storage system damage or faults, including battery monitoring faults, temperature increases above normal operating parameters, electrical faults, chemical spills or reactions, off-gassing, thermal events/runaway, smoke and fire. ▪ Bushfire and grassfire. ▪ The management of fire water runoff. o Details of the elements monitored/controlled by the Battery Management System (BMS), including internal temperature, state of charge, voltage, etc. and the locations this information is available (e.g., at the BESS containers, in an on-site control room, off-site monitoring facilities). o A plan for partial and full decommissioning of the battery energy storage system in the event of an emergency incident that renders the facility inoperable or unsafe, before its anticipated end-of-life. o Any information that supports the considerations in Appendix B: Emergency Response Considerations for Large-Scale Battery Energy Storage Systems. • This information must also be provided within the facility's Emergency Information Book. *Additional Requirements for Solar Facilities* • A solar energy facility Emergency Plan must additionally include: o Emergency procedures for isolation and shut-down where solar panels and/or related infrastructure are involved in fire. o Emergency procedures for fires within the vicinity of solar energy facilities. o Specifications for safe operating conditions for temperature, and the hazards related to electricity generation at the facility. • This information must also be provided within the facility's Emergency Information Book.	***All Facilities*** ***BESS*** ***Solar***	• Bushfire emergency management preparedness and response concepts for the renewable energy infrastructure has been summarised in Section 3.10 of this BRMP. • The bushfire emergency management preparedness and response concepts detailed in Section 5.8 of the project BMP, which cover both proposed buildings and renewable energy infrastructure, are to be incorporated into the overall facility Emergency Management Plan. • The additional requirements for BESS and solar facilities documented in the CFA Guidelines, have been included in the Emergency Information Book and signage for attending firefighters, and the site Emergency Management Plan • ***Based on the above, all requirements with the CFA Guidelines have been met.***
Section 8. Provision of Emergency Information	***Developing an Emergency Information Book*** • An Emergency Information Book must be developed and available to emergency responders, and include the following: o A description of the premises, its infrastructure and operations. o Site plans that include the layout of the entire site, including buildings, internal roads, infrastructure, fire protection systems and equipment, dangerous goods storage areas, gas detectors, battery energy	***All Facilities***	• The Emergency Information Book and signage, and emergency service familiarisation process for the renewable energy infrastructure, has been determined through application of the CFA Guidelines and detailed in Sections 3.8 and 3.9 of this BRMP. • These requirements have been incorporated into Sections 5.6 and 5.7 of the project BMP. • ***Based on the above, all requirements with the CFA Guidelines have been met.***

CFA Guideline Section	Requirement	Type	Development Response
	storage systems, substations/terminals, grid connections, drains and isolation valves, neighbours and the direction of north. ○ A manifest of dangerous goods (if required) as per Schedule 3 of the Dangerous Goods (Storage and Handling) Regulations 2022. ○ Procedures for the management of emergencies, including evacuation, shelter-in-place (for facilities at risk of bushfire/grassfire), containment of spills and leaks, and fire procedures (including infrastructure/plant fires, vehicle fires, grassfire/bushfire) ○ Details of emergency equipment, including the type and location of gas detectors. ○ Up-to-date contact details for site personnel, regulatory authorities and site neighbours. ○ Safety Data Sheets (SDS) for dangerous goods stored on-site. • Emergency Information Books must be located weatherproof container, at each vehicle entrance the facility • Prior to commissioning of the facility, a familiarisation visit and explanation of emergency procedures is to be offered to local fire brigades and other emergency services. ○ A schedule for ongoing site familiarisation to account for changing personnel, facility infrastructure and hazards, and emergency exercises should be developed in conjunction with the local fire brigade ○ A review of the information contained within the facility's Emergency Information Book must be undertaken prior to commencement of bushfire season annually.		

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Appendix 1 BESS Historical Failure Events and Testing Review

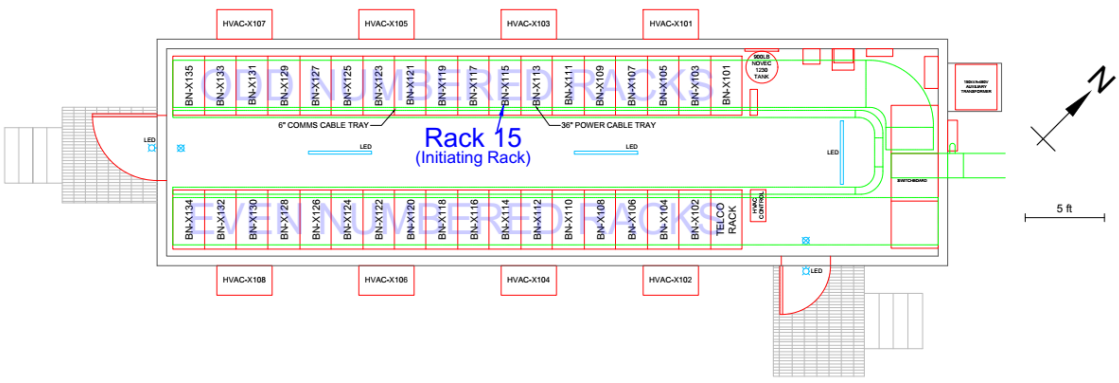
- **Arizona Containerised BESS Failure (2019)**
- **Victorian Big Battery Fire Review Findings (2021)**
- **Bouldercombe Battery Project Fire Findings (2023)**
- **Fire Protection Research Foundation Li-ion battery energy storage system fire testing (2015)**
- **Fisher Engineering Inc Megapack fire testing**

Arizona Containerised BESS Failure (2019)

On 19 April 2019, a fire was reported at an unmanned BESS containing Li-ion batteries in Arizona, which several hours later exploded, injuring several firefighters and destroying the BESS and its container (UL, 2020). The BESS was owned by the local power company, and consisted of a Li-ion battery array (capacity of 2 MWh), which was to integrate solar energy resources in an area with high rooftop solar penetration and grid services, including voltage regulation and power quality.

The BESS had the following features (DNV-GL, 2020):

- Was a containerised system in a standard shipping container (15 m long x 4 m wide x 3.6 m high).
- Internal components included all the battery modules, battery management systems (BMS), power inverters, HVAC, fire suppression, data capture and monitoring equipment, and other auxiliary components.
- Included 27 racks that each housed 14 battery modules (each with 28 lithium-ion NMC battery cells)
- Only external components were BESS interconnection apparatuses such as transformers, breakers, and switch gear.
- The BESS was monitored remotely via wireless communication.
- Fire systems consisted of:
  - Very Early Smoke Detection Apparatus (VESDA) laser-based smoke detection system to detect fine particles and diminishing visibility (due to smoke) within a room.
    - Detection of smoke or fire would sent a signal to fire alarm panel, for alarm of suppression agent discharge.
  - A Novec 1230 “total flooding” clean agent fire suppression system,
    - At the time of commissioning, these clean agent systems were a common method for managing fire suppression in BESS containers because clean agents are electrically nonconductive and do not leave a residue.



A summary of the failure event and subsequent explosion is as follows:

- On 19 April 2019 at 16.54, a battery cell in Rack 15 the BESS experienced a sudden drop in voltage during a charge cycle, equivalent to a single cell voltage drop. Moments after the voltage drop occurred, the battery cell went into thermal runaway.
  - At this time, all batteries were charged to 90% state-of-charge (SOC).
- This event generated off-gassing and smoke that activated the VESDA smoke detection system and led to the discharge of the Novec 1230 agent approximately 60 seconds following voltage drop.

- The initiating cell's thermal runaway cascaded into thermal runaway of neighbouring cells and modules. The off-gassing of battery cells from the cascading thermal runaway created a flammable atmosphere within the BESS.
- Approximately 45 mins after suppression system discharge, local fire brigade was notified by call to dispatch of the bad smell and smoke. Firefighters arrived on scene about 8-9 mins following dispatch notification.
- Remote communications with the BESS were lost just following the dispatch call, approximately 50 minutes after initial event.
- Approximately 3.25 hours after the initial voltage drop, firefighters opened the side container door, and approximately 2-3 minutes after the door was opened, an explosion occurred.
    - The doors on the side and rear of the BESS and other debris were ejected by the explosion and the HVAC systems were also significantly damaged.
    - Other firefighters outside the BESS described hearing a loud noise and seeing a jet of flame that extended 23 m outward, and 6 m vertically, from the southeast-facing door. At least one firefighter was thrown 20 m from the BESS.
    - After the explosion, there was no visible fire in the BESS, but flames were visible in the desert to the southeast of the BESS, approximately 23 m away, which were extinguished by attending firefighters.

Based on post-incident investigation, the series of events resulting in the explosion were concluded to be the following (DNV-GL, 2020):

- Internal failure in a battery cell initiated thermal runaway.
    - The failure was caused by an extensive cascading thermal runaway event, initiated by an internal cell failure within one battery cell, likely due to internal defect within battery.
- The fire suppression system was incapable of stopping thermal runaway.
    - The total flooding clean agent fire suppression system operated early in the incident, and in accordance with its design, however clean agent fire suppression systems are designed to extinguish incipient fires in ordinary combustibles, and are not capable of preventing or stopping cascading thermal runaway in a BESS.
- Lack of thermal barriers between cells led to cascading thermal runaway.
    - Thermal runaway cascaded and propagated from the incipient cell, through every cell and module in the rack, via heat transfer, which was aided by the lack of adequate thermal barrier protections between battery cells, which may have stopped or slowed the propagation of thermal runaway.
- Flammable off-gases concentrated without a means to ventilate or monitor.
    - The uncontrolled cascading of thermal runaway through the battery rack led to the production of a large quantity of flammable gases, which were assessed to be sufficient to create a flammable atmosphere within the BESS container.
    - The design of the BESS did not include explosion venting or adequate mechanical ventilation to prevent accumulation of flammable gases above an explosive concentration, noting that this was not required by applicable codes at the time the BESS was commissioned. It is also noted that the clean agent fire suppression system does require a level of airtightness to enable retention of the agent for a period of time, although this was ineffective in arresting thermal runaway.
    - The fire and smoke detection systems did not include, and were not required to include, gas detection, thus there was no way for attending firefighters to monitor gas concentration conditions inside the BESS from a physically secure location.
    - The BESS communication system failed therefore there was no ability to understand the conditions inside the container.

- Emergency response plan did not have an extinguishing, ventilation, and entry procedure, nor was the necessary information available to attending firefighters.
    - Approximately three hours after thermal runaway began, the BESS door was opened by firefighters, agitating the remaining flammable gases, and allowing the gases to make contact with a heat source or spark.
    - The emergency response plan provided to firefighters, although compliant with the applicable codes and standards at the time of the incident, did not provide adequate guidance for mitigating thermal runaway, fire, and explosion hazards generated by the BESS.
    - The emergency response plan was not provided to fire brigade prior to this incident, although this was not required by the applicable codes or standards at the time of the incident.

Based on the above, the post-incident investigations have made the following recommendations (DNV-GL, 2020):

- Cell quality
    - Should be a major focus to limit potential for thermal runaway generating from internal cell defects.
- Cascading thermal runaway
    - A barrier to limit the rate, or prevent cascading altogether, would have reduced the quantity of gases in the atmosphere of the container.
- Ventilation and cooling
    - The container will need to eventually be accessed in order to regain safe control, and the flammable gases must eventually be dissipated before access is gained.
    - A means to safely ventilate the system in a controlled manner will reduce the flammability of the atmosphere, including incorporation of adequate explosion prevention protection as required in NFPA 855 or International Fire Code, where applicable.
    - Prior to ventilating, cooling of the system with water using a dry pipe system, may have decreased the pressure of an explosion if it were to occur.
- Proper monitoring, detection and extinguishing systems and strategies
    - BESS's should incorporate robust communications systems to ensure remote access to data from the BMS, sensors throughout the BESS, and the fire alarm control panel remains uninterrupted.
    - BESSs should incorporate gas monitoring that can be accessed remotely.
    - A clean agent or aerosol alone is not enough to prevent cascading thermal runaway or manage the concentration of flammable gases that will follow, and that a combined strategy of fire suppression followed by ventilation and cooling strategies should be a requirement going forward.
- Response plans and entry
    - Owners/operators of the BESS should develop an emergency operations plan, ideally in conjunction with local fire brigade personnel, which comprehensively details:
        - the hazards associated with Li-ion battery technology including the potentially explosive nature of the gases released during Li-ion battery thermal runaway.
        - response procedures that incorporated system monitoring, the detection of gases, ventilation practices, extinguishing methods, and information to gather before entry.
    - If such training is conducted early in the project development and commissioning process, it permits the attending fire brigade to learn about the system and be aware of its hazards.
        - These procedures should be documented, available outside the BESS container or building, and demonstrated through training which should be refreshed and updated periodically.

The post-incident reports also note the following:

- BESS have historically been packaged into standard shipping containers, however in 2019-2020, there has been a gradual shift from these to compartmentalised, modular cabinets that have ingress protection ratings and stand-alone BMS and/or inverter capability, such that multiple cabinets can be strung together to build a large system.
- Current BESS standards better address hazard assessment and training for first responders, however the industry expectation should go even further and require that hazard assessments and training take place before and during the commissioning of the BESSs.

Victorian Big Battery Fire Review Findings (2021)

A recent example of thermal runaway occurring in Australia, was the Victorian Big Battery fire in 2021.

- In July 2021, a single Megapack at Victorian Big Battery (VBB) in Geelong caught fire and spread to a neighbouring Megapack during the initial installation and commissioning. The fire did not spread beyond these two Megapacks (212 Megapacks on the project in total) and they burned themselves out over the course of approximately six hours. Plate 4 depicts the timeline of events for the fire.
- There were no injuries to the general public, to site or emergency services personnel as the Megapacks failed safely (i.e., slowly burned themselves out with no explosions or deflagrations), as they are designed to do in the event of a fire.
- Fisher Engineering Inc (FEI) conducted the independent review of the fire, with Energy Safe Victoria (ESV) producing a summary of the technical findings.
- The cause was identified as being a leak within the cooling system that caused a short circuit that led to a fire in an electronic component which led to a thermal runaway and fire in an adjacent battery compartment within one Megapack, which spread to an adjacent second Megapack.

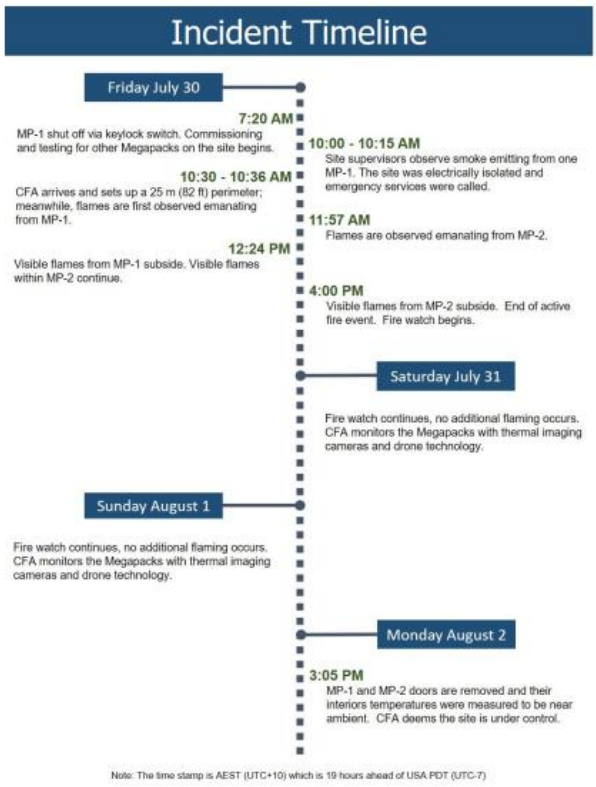


Plate 4: Victorian Big Battery Fire: Incident Timeline (Source: FEI 2022)

- Factors that contributed to this incident included:
  - The supervisory control and data acquisition (SCADA) system took 24 hours to 'map' the Megapack and provide full data and oversight functionality to operators. The Megapack that caught fire was not mapped before being switched into an off-line mode, which prevented the receipt of alarms at the control facility.
  - A key lock was operated correctly to switch the Megapack to off-line service mode (which was no longer required for ongoing commissioning) but this caused:
    - telemetry systems for monitoring the condition of the Megapack to shut down and so

remove visibility of the developing event
    - the battery cooling system to shutdown
    - the battery protection system to shut down, including the high voltage controller (HVC) that could have operated a pyrotechnic fuse to disconnect the faulty battery unit.
- Based on the cause and contributory factors, the following remediation measures have been put in place to prevent a recurrence of this incident:
    - Each Megapack cooling system is to be fully functionally and pressure tested when installed on site and before it is put into service
    - Each Megapack cooling system in its entirety is to be physically inspected for leaks after it has been functionally and pressure tested on site
    - The SCADA system has been modified such that it now 'maps' in one hour and this is to be verified before power flow is enabled to ensure real-time data is available to operators
    - A new 'battery module isolation loss' alarm has been added to the firmware; this modification also automatically removes the battery module from service until the alarm is investigated
    - Changes have been made to the procedure for the usage of the key lock for Megapacks during commissioning and operation to ensure the telemetry system is operational
    - The high voltage controller (HVC) that operates the pyrotechnic fuse remains in service when the key lock is isolated
    - The proposed mitigation procedures to be rolled out to applicable Megapacks globally.
- ESV concluded that the incident was most likely initiated by a Megapack coolant leak. The absence of a number of monitoring and protection systems that would have been available had the initial Megapack not been subsequently switched to off-line service mode allowed the initial fault to go undetected and resulted in the total loss of two Megapacks. The affected Megapacks failed safely despite total loss.

Bouldercombe Battery Project Fire Findings (2023)

In September 2023, a lithium Tesla Megapack 2.0 unit ignited at the Bouldercombe Battery Project in Rockhampton in Queensland, owned and operated by Genex Power. The following information has been released regarding the fire:

- The fire ignited at 7.32pm on 26 September 2023 in one of the Megapack units (40 in total were installed)
- No-one was on site at the time of the incident.
- On advice from the Queensland fire brigade and protocols provided by Tesla:
  - The low intensity fire was allowed to burn out with no water required to be used on the fire itself.
  - Queensland fire brigade monitored temperatures within, and around, the unit to ensure visible fire didn't spread.
  - Queensland fire brigade monitored gas levels and conducted air sampling in the Bouldercombe region, and confirmed residents should have no concern about toxic gas.
    - It is noted that smoke did spread across the immediate area, and nearby residents were urged to stay indoors and keep respiratory medication close by.
- The fire did remain contained to the single initially affected Megapack unit, without propagating to other BESS units.
- While a specific time of extinguishment is not provided, it is noted that Genex re-energised the site and subsequently completed a charge across 36 Megapack units on the evening of 28 September 2023, less than 2 days following the fire.

Further information was provided in November 2023, including:

- Tesla conducted a preliminary analysis via remote diagnostics immediately following the fire
- On 13 October, the affected Megapack was transported to a testing facility in Melbourne to complete further analysis via physical inspection.
- A full cause analysis report from Tesla has not yet been made publicly available however the following is noted:
  - The fire has been blamed on a fault in the power interface with the grid, and not within the Megapack battery itself.
  - Tesla replaced the two faulty power electronics units, and conducted a physical inspection of the power electronics within the remainder of units
  - Genex implemented upgrades to breaker control setting response times to further mitigate against a potential future event

Fire Protection Research Foundation Li-ion battery energy storage system fire testing

In 2015, internal and external fire testing was undertaken on a Tesla Powerpack as part of a hazard assessment of lithium-ion battery energy storage systems conducted by the Fire Protection Research Foundation (FPRF, 2016). A high-level summary of the testing methodology and results is provided below:

External Fire Test

- *Methodology*
  - The test was conducted on a Tesla Powerpack battery pack that was at full 100% state of charge
  - The Powerpack was exposed to a 400 kW propane burner located adjacent to the steel enclosure, producing temperatures approaching 1100 °C and direct flame contact
  - The enclosure was exposed to the propane burner for a duration of 60 minutes, with monitoring occurring for 3 hours and 45 minutes from the start.
  - A variety of temperature, pressure and gas measurements were taken, in addition to video, photography and visual observations.
- *Key Results*
  - It was approximately 35 min into the test before visible signs of impact were observed, namely white smoke.
  - Sustained flaming occurred after 47 minutes, with steady popping sounds consistent with thermal runaway. Flaming from the cabinet continued until 3 hours and 41 minutes from the start of the test.
  - No projectiles or explosions were observed at any time

Internal Fire Test

- *Methodology*
  - The test was conducted on a Tesla Powerpack battery pack that was at full 100% state of charge
  - During the internal fire test, multiple battery cells were forced into thermal runaway by multiple internal ignition sources (small heaters)
  - The test is aims to overwhelm the Powerpack safety features and induce cascading thermal runaway.

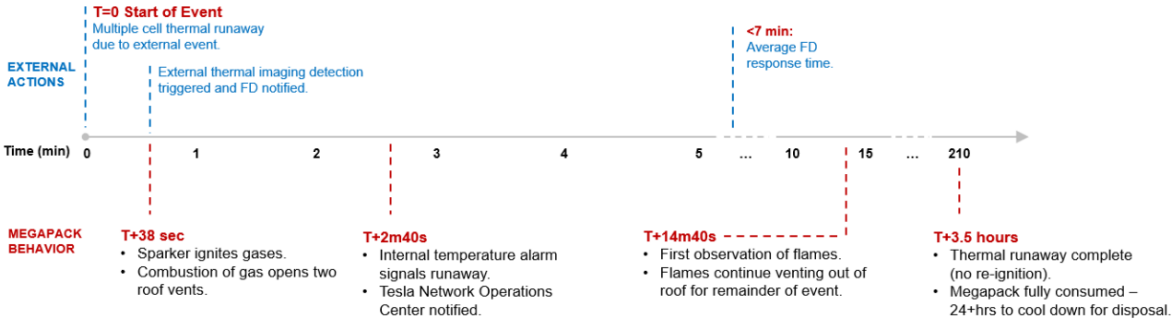
- *Key Results*
  - Popping sounds from the interior of the Powerpack were heard sporadically after 12 minutes from the start, with smoke commencing after 15 minutes and ceasing after 1 hour and 30 minutes.
  - No flames, projectiles or explosions were observed at any time
  - Thermal runaway was restricted to the module in which the runaway event was initiated, and did not propagate outside the cells where the heaters (ignition source) were installed.

Fisher Engineering Inc Megapack fire testing

- Fisher Engineering, Inc. (FEI) performed an analysis of the Megapack energy storage system, including review of the construction, design, fire safety features and UL9540A large-scale fire test data against the regulatory requirements in International and US fire codes and standards, including:
  - 2021 International Fire Code (IFC)
  - 2021 National Fire Protection Association (NFPA) 1 Fire Code
  - 2020 National Fire Protection Association (NFPA) 855, Standard for the Installation of Stationary Energy Storage Systems
  - 2019, UL9540A, Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems, Edition 4
- Linfire note that the FEI analysis is not specifically related to management of bushfire risk, however some observations and outcomes are considered relevant.

Analysis Results and Comments

- Suitable protection against deflagration (heating substance until it burns away rapidly) is to be provided where required (where BESS exceeds certain sizes)
- US Fire codes require areas within 10 ft (3 m) on each side of outdoor BESS shall be cleared of combustible vegetation and other combustible growth.
  - Single specimens of trees, shrubbery, or cultivated ground cover such as green grass, ivy, succulents, or similar plants used as ground covers shall be permitted to be exempt provided that they do not form a means of readily transmitting fire.
- A large-scale UL9540A fire test was conducted in May 2020, to evaluate thermal runaway and fire propagation. This is test is referenced in both the IFC and NFPA 1 as a fire test method capable of providing key fire safety information of a BESS.
  - The test was performed on a 3 MWh Megapack (with 17 battery modules which is the maximum number of battery modules), with cells fully charged.
  - This is considered the worst-case scenario of all the Megapack variations that can be installed, as they can be as few as 6 battery modules (about 1MWh) and due to the smaller capacity, would not be expected to perform worse from this worst-case scenario.
- Plate 5 summarises the key events that occurred during the UL9540A fire testing
- Radiant heat flux levels recorded during the test were as follows:
  - between minutes 38 and 43, at distances of 20 feet (6.1 m) and 30 feet (9.1 m) in front of the Megapack, the highest values measured during this 5-minute stretch of time was 28.8 kW/m2 and 9.8 kW/m2 respectively.
  - at 30 feet (9.1 m), the radiant heat fluxes were between 1.5 kW/m2 and 9.8 kW/m2 with an average value of 4.9 kW/m2.
  - A brief secondary heat flux peak was recorded between minutes 53 and 58; however, the heat fluxes never reached as high as the initial peak that occurred between minutes 38 and 43.



Time (h:mm:ss)	Event
0:00:00	Start of test. First cells go into thermal runaway.
0:00:38	Internal sparker ignites localized concentration of flammable gases and over-pressure roof vents open.
0:00:38	External thermal imaging detector alarm goes into alarm.
0:02:40	Internal module temperature alarm signals thermal runaway at the BMS and notifies the Tesla Network Operations Center.
0:08:25	Ongoing constant stream of hot smoke and gases coming out of the over-pressure roof vents.
0:14:40	First observation of external flames. Continuous flaming event from this time until test end.
0:38:00 – 0:43:00	Peak heat flux measured 20-30 feet in front of Megapack.
3:30:00	End of test. Last observation of visible flames. Fire consumed the Megapack slowly spreading from module bay to module bay until all cells were combusted. All doors remain shut throughout the event. No projectiles, explosions or flying debris were observed.

Plate 5: UL9540A Megapack Fire Testing: Timeline of Key Event (Source: FEI 2020)

- Fire never spread to the target Megapacks installed 150 mm to the side and to the back of the Megapack nor were the cells of the neighbouring Megapacks damaged by the heat.
- During the test, and afterwards during clean-up, no liquid runoff (such as from glycol) was observed.
- The UL9540A large-scale fire testing demonstrated that in the event of a thermal runaway of the Li-ion cells, the Megapack has safety features installed to mitigate the risks of an explosion. During the test, the fire consumed the Megapack slowly, spreading from module bay to module bay until all cells were combusted. All doors remain shut throughout the event and no projectiles, explosions or flying debris were observed; only flames were observed emanating from the roof vents.

Lot 10896 Turkey Flat Road, Kadathinni Development Application
Renewable Energy Facility (Solar Farm, Battery Energy Storage System and Substation)

June 2025

element. | PART OF SLR

Level 1, 500 Hay Street. Subiaco WA 6008
T. (08) 9289 8300 – **E.** hello@elementadvisory.com.au

elementadvisory.com.au

Submission 1

Good Afternoon,

Re: Proposed Renewable Energy Facility (Solar Farm, Battery Energy Storage System & Substation) Lot 10896 Turkey Flat Road, Kadathinni
ATCO Reference: LM01721882

ATCO Gas Australia (ATCO) has **no objection** to the proposed application, based on the information and plan provided.

Advice notes:

- Anyone proposing to carry out construction or excavation works must contact 'Before You Dig Australia' (www.byda.com.au) to determine the location of buried gas infrastructure. Refer to ATCO document AGA-O&M-PR24- Additional Information for Working Around Gas Infrastructure https://gas.atco.com/en-au/natural-gas/wa-gas-network/working-around-gas-infrastructure.html

- Proposed construction and excavation works need to be managed in accordance with the ATCO document Additional Information for Working Around Gas Infrastructure - AGA-O&M-PR24 https://gas.atco.com/en-au/natural-gas/wa-gas-network/working-around-gas-infrastructure.html

Please accept this email as ATCO's written response.

Should you have any queries regarding the information above, please contact us on 13 13 56 or eservices@atco.com.

Kind Regards

Kim Hatcher
Land Liaison/Engineering Coordinator
ATCO, Gas Division, Australia

A. 81 Prinsep Road, Jandakot, Western Australia, 6164
ATCO.com.au **LinkedIn** **Facebook** **X**

ATCO Australia™

ATCO acknowledges Aboriginal people as the Traditional Custodians of country throughout Australia including Torres Strait Islander peoples.

Submission 2

Enquiries: Mark Willson (08 9956 1234)
Our Ref: 002-518
Your Ref: OCR256885

23 July 2025

Keith Woodward
Shire of Three Springs
PO Box 117
Three Springs WA 6519

Via email: general@threesprings.wa.gov.au

Dear Keith,

PROPOSED RENEWABLE ENERGY FACILITY
SOLAR FARM, BATTERY ENERGY STORAGE SYSTEM & SUBSTATION
LOT 10896 TURKEY FLAT ROAD, KADATHINNI

Thank you for consulting Main Roads on the proposed renewable energy facility.

The Lot 10896 is not located within or adjacent to a road reserve under Main Roads jurisdiction. Additionally, Main Roads has no current plans in the area that would affect Lot.

Accordingly, Main Roads does not object to the proposal and provides the following comment:

- A traffic management plan in conjunction with an application for a permit that requires vehicle and machinery access and movement for Restricted Access Vehicles shall be submitted for approval to the satisfaction of Heavy Vehicle Services – Main Roads Western Australia. (e.g. large transformers)

If you require further information, please contact Mark Willson on (08) 9956 1234 or by email at mwgplanning@mainroads.wa.gov.au

Yours sincerely,

NETWORK MANAGER
MID WEST-GASCOYNE REGION

Submission 3

Development Services
629 Newcastle Street Leederville WA 6007
PO Box 100 Leederville WA 6902
T (08) 9420 2099
F (08) 9420 3193

Your Ref: A740 & OCR256888
Our Ref: DAP424487
Enquiries: Matt Calabro
Direct Tel: 9420 2099

23 July 2025

Chief Executive Officer
Shire Of Three Springs
132 Railway Road
THREE SPRINGS WA 6519

Attention of: Keith Woodward

Re: Proposed Renewable Energy Facility (Solar Farm, Battery Energy Storage System & Substation) Lot 10896 Turkey Flat Rd, Kadathinni

Thank you for your letter dated 16 July 2025. We offer the following comments regarding this proposal.

No water or wastewater services, or other Water Corporation assets are in the area. The developer is proposing onsite services including waste containment and removal.

Water Corporation has No Objections.

Should you have any queries or require further clarification on any of the above issues, please do not hesitate to contact me at matt.calabro@watercorporation.com.au

Regards,

Matt Calabro
Senior Planner – Land Use Planning
Development Services

Submission 4

From: Anthony Lebessis <anthony.lebessis@team.telstra.com>
Sent: Monday, 28 July 2025 9:39 AM
To: <es@threesprings.wa.gov.au>
Subject: Re: Proposed Renewable Energy Facility (Solar Farm, Battery Energy Storage System & Substation) Lot 10896 Turkey Flat Road, Kadathinni

Good morning,

Please find attached.

Please be advised that Telstra has **no objections** to the proposed renewable Energy Facility (Solar Farm, Battery Energy Storage System & Substation) Lot 10896 Turkey Flat Road, Kadathinni.
Telstra can utilise statutory notices in the future if it wants to access the land for the purposes of any inspection, maintenance and installation of low impact facilities.

Regards

Anthony

Lebessis

Asset Protection & Relocation
Location Intelligence Network Technical Specialist Road Closures/Openings, Tenures & Reticulations
Design & Construct | InfraCo Operations & Asset Management
Brisbane QLD 4001
Australia

P +07 3455 2365
Q 1800 653 935
E Anthony.Lebessis@team.telstra.com
W www.telstra.com

This email may contain confidential information.
If I've sent it to you by accident, please reply to this email to notify the sender of its incorrect delivery and then delete both it and your reply.

PLEASE NOTE:

Please email your future requests to F0501488@team.telstra.com * DO NOT POST ***. Also ensure that clear and legible plans or maps are provided in order to avoid delays in processing your request .**

BEFORE YOU DIG www.byda.com.au
Zero Damage - Zero Harm

Submission 5

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

PARKS AND WILDLIFE SERVICE

Your ref: A740 / OCR256873
Our ref: PRS 54399
Enquiries: Jess Gillespie
Phone: 9964 0901
Email: jess.gillespie@dbca.wa.gov.au

Mr Keith Woodward PSM
Chief Executive Officer
Shire of Three Springs
PO Box 117
THREE SPRINGS WA 6519

Email: general@threesprings.wa.gov.au

Dear Mr Woodward

PROPOSED RENEWABLE ENERGY FACILITY (SOLAR FARM, BATTERY ENERGY STORAGE SYSTEM AND SUBSTATION) LOT 10896 TURKEY FLAT ROAD, KADATHINNI

Thank you for your letter received 16 July 2025 regarding the above proposed Renewable Energy Facility. The Department of Biodiversity, Conservation and Attractions (DBCA) provides the following comments.

DBCA supports the recommendation by SLR Consulting (2025) to undertake an in season targeted survey in the adjacent roadside vegetation should the two current driveway access points not be used for the proposed project, to identify potential occurrences of *Grevillea erinacea* P3.

The surrounding remnant vegetation is considered to hold high biodiversity value, providing suitable habitat for threatened and priority flora species. Roadside remnant vegetation adjacent to the Eneabba-Three Springs Road/Turkey Flat Road intersection and the section on Turkey Flat Road proposed to be upgraded may provide suitable habitat for conservation significant species. It is recommended that consideration is given to roadside vegetation during the planning and implementation of proposed road upgrades for the project.

Should vegetation clearing be proposed, it should be noted that the clearing of native vegetation requires a Native Vegetation Clearing Permit obtained from the Department of Water and Environmental Regulation, unless of a kind that is exempt in accordance with Schedule 6 or Regulation 5 (Clearing of Native Vegetation Regulations) of the *Environmental Protection Act 1986*.

Should the mitigation measure recommended in the Visual Impact Assessment (SLR, 2025) to plant native shrubs along the Eneabba-Three Springs Road (northwestern) side of the lease area be considered to minimise visual impact of the project, consideration should be given to using species of local provenance.

Thank you for raising this matter to our attention. If you have any queries regarding this matter, please contact Jess Gillespie on 9964 0901.

Yours sincerely



Allison Donovan
REGIONAL MANAGER
Midwest Region

29 July 2025

Submission 6

Department of **Mines, Petroleum and Exploration**

GOVERNMENT OF WESTERN AUSTRALIA

Your ref OCR256880 (File ref A740)
Our ref DMS10666/2025
Enquiries Deepika Venkataramani
9222 3824
deepika.venkataramani@dmpe.wa.gov.au

Resource and Environmental Regulation
29 July 2025

Krystyna East
Deputy Chief Executive Officer
Three Springs Shire Council
Sent by Email – general@threesprings.wa.gov.au
Three Springs WA 6519

Dear Madam

DEVELOPMENT APPROVAL - SHIRE OF THREE SPRINGS - PROPOSED RENEWABLE ENERGY FACILITY - SOLAR FARM - LOT 10896 TURKEY FLAT ROAD KADATHINNI

Thank you for your letter dated 16/07/2025 inviting comment on the proposed renewable energy facility (solar farm, battery energy storage system & substation) Lot 10896 Turkey Flat Road, Kadathinni.

The Department of Mines, Petroleum and Exploration (DMPE) has determined that this proposal raises no significant issues with respect to mineral and petroleum resources, geothermal energy, and basic raw materials.

DMPE lodges no objections to the above development application.

Yours sincerely

Deepika Venkataramani

Deepika Venkataramani | Senior Geologist
Resource Security Directorate
29 July 2025

Locked Bag 100 East Perth WA 6892
www.dmpe.wa.gov.au
ABN 69 410 335 356

Submission 7

GOVERNMENT OF WESTERN AUSTRALIA

MID WEST DEVELOPMENT COMMISSION

Our Ref: A14413470
Your Ref: OCR256881
Enquiries: Nils Hay

Keith Woodward
Shire of Three Springs
Email: general@threesprings.wa.gov.au

Dear Mr Woodward,

Proposed Renewable Energy Facility Lot 10896 Turkey Flat Road, Kadathinni

The Mid West Development Commission (MWDC) provides this submission for the proposed renewable energy facility located at Lot 10896 Turkey Flat Road, Kadathinni.

MWDC is a statutory authority of the Western Australian State Government and is one of nine Regional Development Commissions, functioning under the provisions of the Regional Development Commissions Act (1993). We can confirm that MWDC is the relevant Regional Development Commission for the Shire of Three Springs.

MWDC's role is to coordinate and promote economic and social development in the Mid West to maximise prosperity and wellbeing for the region. MWDC achieves this by providing the regional link between government policy and planning and regional aspirations and needs.

MWDC is supportive of initiatives that align with our strategic objectives, including the development of renewable energy projects in the Mid West region, as per our 2023-26 Strategic Plan Initiative 1.2.1: Facilitate green energy production and transmission for domestic supply and export industry.

MWDC has been briefed by Trina Solar on this project. We also understand that Trina Solar has undertaken consultation with the local community as part of the project's planning process.

Through our own engagment across the North Midlands we note that there is strong desire from communities to ensure that projects provide a material return back to host communities, and the broader region. We support this general proposition, as envisaged in PoweringWA's recently-released Draft Guideline on Community Benefits for Renewable Energy Projects. With multiple new renewable energy projects existing and proposed for the North Midlands, gaining and maintaining social licence will be important for both individual projects and the energy sector at large.

As such, we are generally supportive of the proposed project at Lot 10896 Turkey Flat Road, but highlight the value of meaningful community engagement from proponents, and the use of community benefit frameworks - or similar mechanisms - that deliver tangible benefits back to host communities, and the Mid West region.

Yours sincerely

Nils Hay
CHIEF EXECUTIVE OFFICER
30 July 2025

20 Gregory Street, Geraldton WA 6530
www.mwdc.wa.gov.au
t +61 (0)8 9956 8555
e info@mwdc.wa.gov.au

Submission 8

Our Ref: D39601
Your Ref: OCR256874

Simon Lancaster
Shire of Three Springs
general@threesprings.wa.gov.au

Dear Mr Lancaster

RE: LOT 10896 TURKEY FLAT ROAD, KADATHINNI – PROPOSED RENEWABLE ENERGY FACILITY (SOLAR FORM, BATTERY ENERGY STORAGE SYSTEM AND SUBSTATION) - DEVELOPMENT APPLICATION

I refer to your email dated 18 June 2025 regarding the submission of a Bushfire Management Plan (BMP) (Version 0), prepared by Linfire Consultancy and dated 27 March 2025, for the above proposed development. The BMP is accompanied by a Bushfire Risk Management Plan (BRMP) also from Linefire Consultancy dated 27 March 2025 in relation to the proposal.

This advice relates to the *State Planning Policy 3.7 Bushfire* (SPP 3.7) and supporting *Planning for Bushfire Guidelines* (Guidelines), as well as DFES' role and responsibilities as Hazard Management Agency for Fire in Western Australia.

General Comment

- DFES acknowledges that the site is currently used for agricultural purposes, and the proposed development includes a 400-megawatt solar farm, a 400-megawatt battery energy storage system (BESS) storage and a substation.
- DFES notes that the current version of SPP 3.7 and the Guidelines no longer makes reference to 'high risk land use'. The decision maker has referred this proposal to DFES as a discretionary referral. DFES considers that SPP 3.7 and the Guidelines do not adequately address high risk land use such as renewable energy facilities. Given the temperature sensitive nature of the infrastructure, it is critical to ensure that the proposed design adequately responds to bushfire risks in order to protect life, property and infrastructure.
- Accordingly, DFES has also assessed the proposal against the *CFA Design Guidelines and Model Requirements – Renewable Energy Facilities* as amended (REF Guidelines) which is currently considered best practice for the development of renewable energy facilities.
- Specific requirements of SPP 3.7 and the supporting Guidelines and the REF Guidelines are to be further addressed in the BMP as outlined in the below assessment. The assessment comments relating to the REF Guidelines have been incorporated into the below overall assessment comments for the respective issue/element.

Recommendation: Compliance with acceptable solutions not fully demonstrated – minor modifications required

DFES advises that the BMP has adequately identified issues arising from the bushfire risk assessment and considered how the proposed development can achieve compliance with the bushfire protection criteria. However, DFES recommends the BMP be modified to ensure it accurately identifies the bushfire risk and necessary bushfire risk management/mitigation measures. The required modifications are listed in the table(s) below.

As these modifications will not affect the design of the proposal, they can be undertaken without further referral to DFES.

Could you please forward notification of the application determination to DFES for our records.

If you require any clarification or further information regarding the below assessment, please do not hesitate to contact Sean He – Senior Land Use Planning Officer on telephone number 9395 9702.

Yours sincerely



Desmond Abel
DIRECTOR LAND USE PLANNING

31 July 2025

Cc: simon.lancaster@chapmanvalley.wa.gov.au

Table 1 – Assessment – Policy Measure 7.1 ii. c. Compliant Preparation of a BAL Contour Map

Vegetation Classification or Exclusions	BMP Modification Required
Administrative Matter Photo points are not provided so that the photographic evidence cannot be correlated with the Vegetation and Effective Slope Map (Figure 4). While the photographic evidence provided generally appears consistent with the aerial image, photo points should be provided in accordance with the Bushfire Attack Level (BAL) Contour Map methodology under the Guidelines.	**Photo points to be added to Figure 4.**
Exclusion Plot 8 – not demonstrated Further evidence to support the exclusion of Plot 8 as non-vegetated or managed to low threat in accordance with AS3959 is required. Specifically: • Western Power transmission corridor. As identified in the BMP, the decision maker is to be satisfied that the necessary permissions from Western Power will be obtained for the proposed ongoing vegetation management. • Vegetation within the solar photovoltaic (PV) arrays. The submitted development plan sheet titled 'Grazing and Livestock Diagram' shows grass up to 250 millimetres high between the solar PV arrays. This is inconsistent with the 100 millimetres height limit stated in the BMP and does not meet the 'minimal fuel condition' under AS3959 to qualify for exclusion. If unsubstantiated, the vegetation should be classified as per AS3959, or the resultant BAL ratings may be inaccurate.	**BAL Rating cannot be validated** Further evidence to support the proposed vegetation exclusion of Plot 8 is required.

Table 2 - Policy Measure 7.1 ii. e. Compliance with the Bushfire Protection Criteria 7: Development – Commercial and Industrial

Element	Assessment	Action
Siting and Design – Siting and Design	**A2.1a – not demonstrated** The BAL ratings cannot be validated for the reason(s) outlined in Table 1.	**BAL Rating cannot be validated** Modification to the BMP is required to address the Assessment advice in Table 1.

Table 3: Policy Measure 7.1 iv. and Section 9.4.2 of the Guidelines: DFES Role as Hazard Management Agency (HMA)

DFES wishes to provide the below additional advice in its role and responsibilities of HMA for Fire in Western Australia.

Bushfire Emergency Plan (BEP)		Action
Bushfire Emergency Plan (BEP)	Given the high risk land use at this location, it is considered appropriate that a *'Bushfire Emergency Plan'* be prepared. Consideration should be given to the Bushfire Emergency Plan (BEP) Manual (as published by the Western Australian Planning Commission) and Section 7 of the REF Guidelines. These contains details of information that should be included in a BEP and will ensure the appropriate content is detailed when finalising the BEP to the satisfaction of the decision maker.	**Comment only.**
Renewable Energy Facilities		**Action**
Risk Management Plan	As per the REF Guidelines, a Risk Management Plan (RMP) describes the risk management process and its outcomes, including the specific site hazards/risks and their analysis, control measures, and the monitoring and review process. A RMP is considered to be a critical requirement of planning and informing fire risk management in the design and operation of renewable energy facilities. While DFES accepts the submitted BRMP to be an RMP prepared against the requirements of the REF Guidelines, the BRMP should further address the following model requirements of the REF Guidelines:	**Modification to the (Bushfire) Risk Management Plan is required to address the Assessment advice.**

	• All the proposed internal access roads should be of all-weather construction and capable of accommodating a vehicle of 15 tonnes. • Containment measures should be provided to the BESS facility to management fire water runoff, chemical spills or leaks. • Provide details of the battery management system (BMS), the fire, vapour and gas detection arrangements and trip or alarm criteria and responses (i.e. what shuts down the system automatically, what isolates sections of the BESS, what initiates a company remote on call staff member to log in and check the BMS or to attend the site, what will initiate an emergency call to DFES). • Consider the potential impact of smoke from an onsite fire on adjacent high voltage infrastructure.	
Consultation	In the event that an approval is granted, the DFES District Officer responsible for this region and the local fire and emergency services should be consulted during the development, construction, and leading up to the commissioning of the facility. It is considered critical for the local fire and emergency services to understand the hazards present in the facility and the measures required to ensure the safety of firefighting personnel when working in or around different parts of the facility. This may impact on how crews respond to a fire within the facility, which may in turn have ramification regarding the optimal number and location of water supplies.	**Comment only.**
DFES Other Technical Advice		**Action**
DFES Land Use Planning	It is the responsibility of the proponent to ensure the proposal complies with relevant planning and building requirements. This advice does not exempt the applicant/proponent from obtaining approvals that apply to the proposal including planning, building, environmental health or any other approvals required by a relevant authority under written laws.	**Comment only.**

Submission 9

From: Strategic Planning Referrals <strategic.planning.referrals@westernpower.com.au>
Sent: Friday, 1 August 2025 2:51 PM
To: <es@threesprings.wa.gov.au>
Cc: Strategic Planning Referrals <strategic.planning.referrals@westernpower.com.au>
Subject: RE: Proposed Renewable Energy Facility (Solar Farm, Battery Energy Storage System & Substation) Lot 10896 Turkey Flat Road, Kadathinni

Hi Patricia,

Thank you for the opportunity to review the development application and I have liaised with our internal customer connection team in respect to this matter, noting the existing and potential Western Power assets relevant to the proposal.

While the customer has been progressing with Western Power, the proposed Western Power managed assets demarcated on the site plan are indicative only. Prior to commencement of works, the proponent shall ensure that the connection, location, design, access and ongoing maintenance and operations of assets is supported and agreed with Western Power.

Please find attached the following advice notes of relevance to the proposal:

(i) The development shall be designed and constructed to protect Western Power infrastructure and interests from potential land use conflict.
(ii) No development (including drainage, fill, fencing, storage or parking) will be permitted within Western Power line and cable easements or restriction zones without the prior written approval of Western Power.
(iii) The applicant should formally progress the Western Power network connection and substation arrangements with Western Power.
(iv) Arrangements being made to the specifications of Western Power for the provision of necessary electricity easements as and where required.

Kind Regards,

Jared Morskate
Principal Land Access & Approvals
Transmission Energy Transition

A 363 Wellington Street Perth 6000
E J.Morskate@westernpower.com.au
W **westernpower.com.au**

Government of **Western Australia**
Department of **Health**

Submission 10

Classification: Official
Your Ref: OCR256875
Our Ref: F-AA-90523-7
Contact: Yashvee Manrakhan-Field 9222 2000

Mr Keith Woodward PSM
Chief Executive Officer
PO Box 117
THREE SPRINGS WA 6519

Attention: Keith Woodward

Via email: general@threesprings.wa.gov.au

Dear Mr Woodward

PROPOSED RENEWABLE ENERGY FACILITY (SOLAR FARM, BATTERY ENERGY STORAGE SYSTEM & SUBSTATION) LOT 10896 TURKEY FLAT ROAD, KADATHINNI

Thank you for your letter dated 16 July 2025, requesting comment from the Department of Health (DoH) on the above proposal.

DoH position

☐ No objection – no comments or advice to provide.
☒ No objection – with comments and/or recommended conditions and advice notes provided below.
☐ Do not support – reasons provided below, i.e. additional reports, studies, plans or other information that should be provided to determine public health risk / legislative compliance.

DoH advice notes

1. Chemical Hazards

The proposed development at Lot 10896 Turkey Flat Road, Kadathinni proposes a 400MW solar farm and 400MW battery storage with 4 hours duration, equal to 1.6GW hours of battery storage. The subject site lot area of 1405.2 hectares with a development footprint of 620 hectares proposes to store electrical energy generated by the on-site solar farm. The closest residential dwellings (3 properties) are located within a 5 km radius of the development footprint. It is noted that the subject site is currently used for agricultural purposes, including livestock grazing. Surrounding land uses include agricultural properties, nature reserves, road, and access tracks.

- The site has not been classified as a C-RR[1], CRU[2], RRU[3] as recorded on DWER's Contaminated Sites database (*Contaminated Sites Act 2003*). However, although this site does not appear on Contaminated sites, it may be subject to other important classifications not recorded on that database. The DoH advised that the proponent should obtain a Basic Summary of Records relating to the land and its surroundings to complete their assessment of the site's suitability for the proposed development.

  [1] C-RR - Contaminated – Remediation Required

  [2] CRU – Contaminated – Restricted Use

  [3] RRU – Remediated for Restricted Use

- For any future rehabilitation of the site, it is important that enough time and resources are set aside to properly carry out investigations, assess any risks, and complete remediation work. These activities should follow the guidelines set out in the National Environment Protection (Assessment of Site Contamination) Measure (NEPM(ASC)M). The DoH recommends that the proponent is made aware of their legal duty under Section 11 of the Contaminated Sites Act 2003. If the owner or occupier knows or suspects that the site may be contaminated—as defined in Section 4 of the Act—they must report this to the Department of Water and Environmental Regulation (DWER) as soon as possible. This will ensure that any potential risks to human health or the environment are managed appropriately and in line with regulatory requirements.
- Battery energy storage systems may pose a fire risk. Suitable measures should be put in place to prevent fires and manage any potential impacts on public health. The DoH recommends that this should include an investigation into any toxic emissions that could be released during a fire. It is also important to assess how these emissions might spread and affect nearby residential areas.
- EPA (2005) guideline "*Separation Distances between Industrial and Sensitive Land Uses*" (Section 2.1) recommends that appropriate separation/buffer distances should be established around land uses where there may be significant offsite impacts, including power generation facilities. The DoH recommends that the potential off-site impacts (noise) from the project is considered, prior to determining the suitability of the site, to minimise public health risks arising.

2. Water supply and wastewater disposal

The proponent must apply to the relevant local government (Shire of Three Springs) for any onsite wastewater treatment systems and holding tank/s. This will be accompanied by a site-specific Site and Soil Evaluation (SSE) undertaken by a qualified consultant during the wettest seasonal time of the year (mid-July/August) as per AS/NZS 1547:2012 and detailed plans to scale showing the proposed building envelopes, proposed onsite wastewater system locations and land application areas, all trafficable areas, parking bays including setback distances to exclusion/riparian zones/flood zones (100m) with all measurements provided.

Recommended conditions

1. The proponent should obtain a Basic Summary of Records relating to the land and its surroundings to complete their assessment of the site's suitability for the proposed development:
    - Schedule 1 — Forms. A guide to contaminated sites available here: Guideline: Identification, reporting and classification of contaminated sites.
2. The proponent should undertake further site-specific technical analysis, in line with the EPA (2005) guideline Separation Distances between Industrial and Sensitive Land Uses and best practice to inform an appropriate separation/buffer distance. This work should be subject to independent review, with advice sought from other relevant agencies, which may include:
    - Department of Local Government, Industry Regulation and Safety (Building and Energy Division, Dangerous Goods)
    - Department of Energy and Economic Diversification (Energy Policy WA)
    - Department of Fire and Emergency Services; and
    - Department of Water and Environmental Regulation (Green Energy Approvals Directorate).
3. Prior to commencement of operations, the proponent must prepare and implement a Fire, Hazard and Emergency Management Plan which includes consideration of the risks to public health of the nearest sensitive premises and community in the event of an incident at the facility, including necessary emergency measures and communications strategy.
4. In the event of a fire, the site should be designed so that fire retardant, liquid waste or other waste products fall within a containment or bunded area/structure and are not discharged or released into the surrounding environment.

Should you have any queries or require further information, please contact System Performance on 9222 2000 or eh.eSubmissions@health.wa.gov.au.

Yours sincerely



Dr Michael Lindsay
EXECUTIVE DIRECTOR
ENVIRONMENTAL HEALTH DIRECTORATE

01 August 2025

Department of
Primary Industries and Regional Development

GOVERNMENT OF WESTERN AUSTRALIA

Your reference: A740, OCR256881
Our reference: LUP 2224
Enquiries: Greg Doncon

Keith Woodward
Chief Executive Officer
Shire of Three Springs
PO Box 117
Three Springs WA 6519

Email: general@threesprings.wa.gov.au

Date: 1 August 2025

Dear Keith

Proposed Renewable Energy Facility (Solar Farm, Battery Energy Storage System & Substation) Lot 10896 Turkey Flat Road, Kadathinni:

Thank you for inviting the Department of Primary Industries and Regional Development (DPIRD) to comment on the above proposal.

Please find the following feedback offered by several teams within DPID addressing specific aspects of the proposed development by Trina Solar (Australia) Pty Ltd to build the Killawarra Solar Farm and BESS in the Shire of Three Springs.

1. Regional Development

DPIRD's regional development portfolio is broadly supportive of this Development Application. However, given the scale of the project, with site lot area of 1,405 Ha and a development footprint of 620Ha, DPIRD holds concerns as to the proponent's proposed plans to share project benefits with the host community.

DPIRD notes that the proponent has contracted consultants SLR to engage with local government and the community via a formal community and stakeholder engagement program. This engagement included the Mid-West Development Commission and the Yamatji Southern Regional Corporation.

SLR has identified the key issues raised through the consultation program. They have made recommendations to the proponent to continue to engage with the community and to establish a community benefit fund.

It is unclear whether the proponent has committed to, or is planning on, acting on these recommendations.

DPIRD recommends that the proponent familiarise themselves with the Clean Energy Council Best Practice Charter and consider applying these principals to strengthen social license and maximise regional benefits.

DPIRD would like to see evidence from the proponent that they have a plan for:

- How they will house workers during both construction and operational phases of the project given housing shortages in the region.
- Guidelines as to how they will establish a community benefit fund including how proponent contributions will be determined.
- Action to engage local contractors and provide local employment.
- How they will work with neighbours to mitigate project impacts. Neighbours being farming properties adjacent to, and/or directly impacted by, the solar farm.

2. Soil and Land Conservation

The soil-landscapes of the site are comprised of three subsystems.

- Coalara 1 subsystem - Sand filled alluvial plain, low dunes common; pale and yellow deep sands, some playa soils
- Coalara 3 subsystem - Plateau remnants, hillcrests and very gently to moderately inclined hillslopes, some moderately inclined breakaway slopes; shallow and deep sandy gravel.
- Coalara 7 subsystem - Upland sandplain; pale and yellow deep sands, gravelly pale deep sand.

The soils of these systems can be challenging for agricultural purposes. The soils of these systems are prone to subsoil compaction and tend to repel water. For these soils:

- 80-90%% have low to extremely low water storage capacity
- 70-80% are acidic at depth, with the remainder at a high risk of becoming acidic
- 95% have a high risk of wind erosion

While the risk of soil erosion is high if the soil is bare, DPIRD expects this is a risk to be managed during the construction / decommissioning phases. The establishment of groundcovers should manage this risk for the duration of the life of this facility.

As these soils are known to be acidic at depth, DPIRD recommends soil tests are conducted across the site to determine if any of the soil chemistry properties will impact engineering plans.

The water erosion risk of these soils, when used for agricultural purposes, is considered low. However, DPIRD is aware that significant weather events, when combined with hard surfaces, will result in soil erosion. A review of the aerial photography confirms that there is a minor tributary that exits in the southeast corner of the site (Development Application, p4). In addition, the landscape shows another four drainage areas where water will be shed from the site during a significant rain event. DPIRD recommends that the proponent prepare management plans for both surface water and wind erosion, incorporating appropriate design methods to manage erosion risks from intense summer or winter weather events.

A solar farm is currently expected to have an operational life of approximately 25 to 30 years. At the end of this period, DPIRD expects the facilities would either be upgraded

to extend the solar farm's operational lifespan or be decommissioned, restoring the area to its previous land use. Given the Coalara 1 & 3 subsystem have been assessed to have low land capability, DPIRD suggests that when the facility is eventually decommissioned, it should be revegetated and restored to its original natural state.

It is important to manage the biosecurity risks associated with the construction and ongoing operations of a solar farm. This will minimise the biosecurity risk for the landholder as well as for adjoining farms and along transport routes. DPIRD recommends that a Development Application include a biosecurity management plan to ensure that the proponent and its subcontractors adhere to biosecurity hygiene protocols and do not introduce or spread pests, weeds, or diseases when entering or leaving the proposed site.

Should you have further enquiries about this response, please contact Greg Doncon on 08 9081 3117 or Greg.Doncon@dpird.wa.gov.au

Yours sincerely



Mr Timothy Overheu
Acting Director Agriculture Resource Management and Assessment
Fisheries and Sustainability

Attachment 1: Coalara 3 subsystem
Attachment 2: Coalara 7 subsystem

Attachment 1:

SOUTH WEST AGRICULTURE REGION REPORT Printed: 13/03/2025
Map Unit Symbol: 222Co_3 **Name:** Coalara 3 subsystem
Type: soil-landscape *Rank:* subsystem *Status:* current

Brief description: Plateau remnants, hillcrests and very gently to moderately inclined hillslopes, some moderately inclined breakaway slopes; shallow and deep sandy gravel
Soil: Shallow and deep sandy gravel
Landform: Plateau remnants, hillcrests and very gently to moderately inclined hillslopes, some moderately inclined breakaway slopes
Geology: Weathered Cretaceous sandstone
Vegetation: Low heath
Location: SE of Eneabba



Representative illustration of a common soil-landscape within the Coalara System

Morphological type(s): crest & upper slope

Occurs in Projects

Code	Name	Mapped (ha)	Scale	Reference	Finish	Reliability
TSL	Three Springs Latham land resources survey	745,774	1:250000	Grose, C. (Unpublished). Three Springs Area Land Resources Survey	1995	Medium data quality, broad scale mapping
DAN	Dandaragan land resources survey	681,445	1:100000	Griffin, E.A. (Unpublished). Dandaragan Area Land Resources Survey	1995	High data quality, midscale or imprecise mapping

WA Soil Groups (percent of Map Unit)

Code	WASG Name	%	Broad (My)Soil
1211	Deep sandy gravel	45	Gravels
1485	Ironstone gravelly pale deep sand	15	Pale sands
1487	Pale deep sand	15	Pale sands

Code	WASG Name	%	Broad (My)Soil
1301	Very shallow soil over ferricrete	10	Very shallow and stony soils
1208	Deep sandy duplex gravel	5	Gravels
1437	Grey shallow sandy duplex	5	Shallow sandy duplexes
1489	Yellow deep sand	5	Coloured sands

Zone Land Units

(WA Soil Groups by Qualifier and Landscape Position in Zone percent of Map Unit)
(*LEGACY* qualifiers are only used for soils associated with map units)

WASG Name	Qualifier	Landscape pos	%	Broad (My)Soil	Simple Landscape
Deep sandy gravel	poor sand, very deep	slopes 3-5%	15	Gravels	Gentle slopes
Deep sandy gravel	poor sand, very deep	crests & slopes <3%	15	Gravels	Gentle slopes
Pale deep sand	poor sand, very deep	crests & slopes <3%	15	Pale sands	Gentle slopes
Ironstone gravelly pale deep sand	poor sand, very deep	crests & slopes <3%	15	Pale sands	Gentle slopes
Deep sandy gravel	poor sand, effective duplex	slopes 5-10%	10	Gravels	Gentle slopes
Very shallow soil over ferricrete	loam soil matrix	crests & slopes <3%	10	Very shallow and stony soils	Gentle slopes
Deep sandy duplex gravel	topsoil is good sand, subsoil has good permeability	crests & slopes <3%	5	Gravels	Gentle slopes
Deep sandy gravel	poor sand, effective duplex	crests & slopes <3%	5	Gravels	Gentle slopes
Grey shallow sandy duplex	acid to neutral subsoil with good permeability	crests & slopes <3%	5	Shallow sandy duplexes	Gentle slopes
Yellow deep sand	poor sand, very deep	crests & slopes <3%	5	Coloured sands	Gentle slopes

Summary Broad (My)Soil by Simple Landscape (percent of Map Unit)

Simple Landscape	%	Coloured sands	Gravels	Pale sands	Shallow sandy duplexes	Very shallow and stony soils
Gentle slopes	100	5	50	30	5	10

Land Management Units (percent of Map Unit)

LMU	%
Coloured sands on Gentle slopes	5
Gravels on Gentle slopes	50
Pale sands on Gentle slopes	30
Shallow sandy duplexes on Gentle slopes	5
Very shallow and stony soils on Gentle slopes	10

Soil Series: none allocated

Land Qualities summary - % Map Unit

.	Land Quality	Most limiting	.	.	Least limiting
1	pH				
1	acidification risk	presently acid: 80%	high: 20%	moderate: 0%	low: 0%
1	0-10 acidity	very strongly acid: 0%	strongly acid: 0%		
1	0-10 alkalinity	strongly alkaline: 0%	alkaline: 0%		
1	15-25 acidity	very strongly acid: 0%	strongly acid: 15%		
1	15-25 alkalinity	strongly alkaline: 0%	alkaline: 0%		
1	50-80 acidity	very strongly acid: 0%	strongly acid: 0%		
1	50-80 alkalinity	strongly alkaline: 0%	alkaline: 0%		
2	SALINITY				
2	surface salinity	extreme: 0%	high: 0%	moderate: 0%	slight to nil: 100%
2	salinity risk	presently saline: 0%	high: 0%	moderate: 0%	nil or partial: 100%
3	SOME PLANT LIMITS				
3	sub surface compact	high: 5%	moderate: 85%	low: 10%	
3	rooting depth	very shallow: 0%	shallow: 10%	moderately shallow: 0%	very deep to mod: 90%
3	water repel	high: 75%	moderate: 25%	low: 0%	nil: 0%
3	water storage	extremely low: 70%	very low: 15%	low: 5%	high to moderate: 10%
4	EROSION				
4	water erosion	extreme: 0%	very high: 0%	high: 0%	nil to moderate: 100%
4	wind erosion	extreme: 0%	very high: 75%	high: 25%	nil to moderate: 0%
4	flood risk	high: 0%	moderate: 0%	low: 0%	low: 100%
4	instability	high: 0%	moderate: 0%	low: 0%	nil to very low: 100%
5	WATER & DRAINAGE				
5	waterlogging	very high: 0%	high: 0%	moderate: 0%	nil to low: 100%
5	site drainage	very poor: 0%	poor: 0%	moderate: 0%	high: 100%
6	OTHER QUALITIES				
6	excavation ease	very low: 0%	low: 10%	moderate: 0%	high: 90%
6	microbial purification	very low: 35%	low: 25%	moderate: 30%	high: 10%
6	phosphorus loss	extreme: 0%	very high: 0%	high: 15%	nil to moderate: 85%

Land capability assessment (Class %, code and description)

Land Use	Class 1+2 %	Class 3 %	Class 4+5 %	Code	Capability Rating desc
Annual horticulture	0	90	10	B1	>70% of the area is Class 1, 2 or 3
Dry Cropping	0	30	70	C1	50-70% of the area is Class 4 or 5
Grazing	0	10	90	C2	>70% of the area is Class 4 or 5
Perennial horticulture	10	80	10	B1	>70% of the area is Class 1, 2 or 3
Vineyards	10	80	10	B1	>70% of the area is Class 1, 2 or 3

Possible soil variation

2024 WA soil groups are more detailed. Soils associated with map units were attributed using the closest match. The table below indicates other soils that could occur.

WA soil group	Pct	Possible soil variation in 2024 WASG
Deep sandy duplex gravel (1208)	5	Acid sandy duplex gravel
Deep sandy gravel (1211)	45	Deep sandy gravel, Sandy-surfaced earthy gravel, may also include Acid sandy gravel
Grey shallow sandy duplex (1437)	5	Any sandy duplex soil group, may also include Shallow duplex sandy gravel. (Now classified using subsoil colour)
Ironstone gravelly pale deep sand (1485)	15	Deep sandy gravel, may also include Ironstone gravelly acid deep sand
Pale deep sand (1487)	15	Acid deep sand, Pale deep sand, Any deep sand soil group, may also include Black deep sand, Ironstone gravelly coloured deep sand, Ironstone gravelly acid deep sand
Very shallow soil over ferricrete (1301)	10	Shallow loamy gravel, Shallow sandy gravel, may also include Calcareous shallow sandy earth
Yellow deep sand (1489)	5	Acid deep sand, may also include Black deep sand, Ironstone gravelly coloured deep sand, Ironstone gravelly acid deep sand

Closest match - WA soil group and Australian soil classification (order and suborder only)

WA soil group and qualifier	Pct	Order	Suborder
Deep sandy duplex gravel (1208), topsoil is good sand, subsoil has good permeability	5	Chromosol	Yellow
Deep sandy gravel (1211), poor sand, effective duplex	15	Arenosol	Red
Deep sandy gravel (1211), poor sand, very deep	30	Arenosol	Red
Grey shallow sandy duplex (1437), acid to neutral subsoil with good permeability	5	Sodosol	Grey
Ironstone gravelly pale deep sand (1485), poor sand, very deep	15	Arenosol	Bleached
Pale deep sand (1487), poor sand, very deep	15	Arenosol	Bleached
Very shallow soil over ferricrete (1301), loam soil matrix	10	Rudosol	Leptic
Yellow deep sand (1489), poor sand, very deep	5	Arenosol	Yellow

Attachment 2:

SOUTH WEST AGRICULTURE REGION REPORT Printed: 13/03/2025
Map Unit Symbol: 222Co_7 **Name:** Coalara 7 subsystem
Type: soil-landscape *Rank:* subsystem *Status:* current

Brief description: Upland sandplain; pale and yellow deep sands, gravelly pale deep sand
Soil: Pale and yellow deep sands, gravelly pale deep sand
Landform: Upland sandplain
Geology: Colluvium
Vegetation: Heath with occasional Eucalyptus todtiana
Location: SE of Eneabba



Representative illustration of the landscape within Coalara 7 subsystem

Landform pattern: **Landform element:**
Relief/modal slope class(s):
Morphological type(s): flat **Slope:**

Occurs in Projects

Code	Name	Mapped (ha)	Scale	Reference	Finish	Reliability
TSL	Three Springs Latham land resources survey	745,774	1:250000	Grose, C. (Unpublished). Three Springs Area Land Resources Survey	1995	Medium data quality, broad scale mapping
DAN	Dandaragan land resources survey	681,445	1:100000	Griffin, E.A. (Unpublished). Dandaragan Area Land Resources Survey	1995	High data quality, midscale or imprecise mapping

WA Soil Groups (percent of Map Unit)

Code	WASG Name	%	Broad (My)Soil
1487	Pale deep sand	35	Pale sands
1485	Ironstone gravelly pale deep sand	30	Pale sands
1489	Yellow deep sand	20	Coloured sands
1211	Deep sandy gravel	5	Gravels
1405	Pale shallow sand	5	Shallow sand
1465	Pale sandy earth	5	Sandy earths

Zone Land Units

(WA Soil Groups by Qualifier and Landscape Position in Zone percent of Map Unit)
(*LEGACY* qualifiers are only used for soils associated with map units)

WASG Name	Qualifier	Landscape pos	%	Broad (My)Soil	Simple Landscape
Pale deep sand	good sand, very deep	upland plain	35	Pale sands	Well drained flats and footslopes
Ironstone gravelly pale deep sand	poor sand, very deep	upland plain	30	Pale sands	Well drained flats and footslopes
Yellow deep sand	fair sand, very deep	upland plain	15	Coloured sands	Well drained flats and footslopes
Deep sandy gravel	poor sand, very deep	upland plain	5	Gravels	Well drained flats and footslopes
Yellow deep sand	poor sand, very deep	upland plain	5	Coloured sands	Well drained flats and footslopes
Pale sandy earth	acid to neutral subsoil with good permeability	upland plain	5	Sandy earths	Well drained flats and footslopes
Pale shallow sand	poor sand	upland plain	5	Shallow sand	Well drained flats and footslopes

Summary Broad (My)Soil by Simple Landscape (percent of Map Unit)

Simple Landscape	%	Coloured sands	Gravels	Pale sands	Sandy earths	Shallow sand
Well drained flats and footslopes	100	20	5	65	5	5

Land Management Units (percent of Map Unit)

LMU	%
Coloured sands on Well drained flats and footslopes	20
Gravels on Well drained flats and footslopes	5
Pale sands on Well drained flats and footslopes	65
Sandy earths on Well drained flats and footslopes	5
Shallow sand	5

Soil Series: none allocated

Land Qualities summary - % Map Unit

.	Land Quality	Most limiting	.	.	Least limiting
1	pH				
1	acidification risk	presently acid: 80%	high: 20%	moderate: 0%	low: 0%
1	0-10 acidity	very strongly acid: 0%	strongly acid: 0%		
1	0-10 alkalinity	strongly alkaline: 0%	alkaline: 0%		
1	15-25 acidity	very strongly acid: 5%	strongly acid: 5%		
1	15-25 alkalinity	strongly alkaline: 0%	alkaline: 0%		
1	50-80 acidity	very strongly acid: 0%	strongly acid: 0%		
1	50-80 alkalinity	strongly alkaline: 0%	alkaline: 0%		
2	SALINITY				
2	surface salinity	extreme: 0%	high: 0%	moderate: 0%	slight to nil: 100%
2	salinity risk	presently saline: 0%	high: 0%	moderate: 0%	nil or partial: 100%
3	SOME PLANT LIMITS				
3	sub surface compact	high: 20%	moderate: 80%	low: 0%	
3	rooting depth	very shallow: 0%	shallow: 0%	moderately shallow: 0%	very deep to mod: 100%
3	water repel	high: 75%	moderate: 25%	low: 0%	nil: 0%
3	water storage	extremely low: 40%	very low: 35%	low: 5%	high to moderate: 20%
4	EROSION				
4	water erosion	extreme: 0%	very high: 0%	high: 0%	nil to moderate: 100%
4	wind erosion	extreme: 0%	very high: 0%	high: 95%	nil to moderate: 5%
4	flood risk	high: 0%	moderate: 0%	low: 0%	low: 100%
4	instability	high: 0%	moderate: 0%	low: 0%	nil to very low: 100%
5	WATER & DRAINAGE				
5	waterlogging	very high: 0%	high: 0%	moderate: 0%	nil to low: 100%
5	site drainage	very poor: 0%	poor: 0%	moderate: 0%	high: 100%
6	OTHER QUALITIES				
6	excavation ease	very low: 0%	low: 0%	moderate: 5%	high: 95%
6	microbial purification	very low: 70%	low: 5%	moderate: 20%	high: 5%
6	phosphorus loss	extreme: 0%	very high: 0%	high: 0%	nil to moderate: 100%

Land capability assessment (Class %, code and description)

Land Use	Class 1+2 %	Class 3 %	Class 4+5 %	Code	Capability Rating desc
Annual horticulture	5	95	0	B1	>70% of the area is Class 1, 2 or 3
Dry Cropping	0	55	45	B2	50-70% of the area is Class 1, 2 or 3
Grazing	5	55	40	B2	50-70% of the area is Class 1, 2 or 3
Perennial horticulture	60	40	0	A2	50-70% of the area is Class 1 or 2
Vineyards	60	40	0	A2	50-70% of the area is Class 1 or 2

Possible soil variation

2024 WA soil groups are more detailed. Soils associated with map units were attributed using the closest match. The table below indicates other soils that could occur.

WA soil group	Pct	Possible soil variation in 2024 WASG
Deep sandy gravel (1211)	5	Deep sandy gravel, Sandy-surfaced earthy gravel, may also include Acid sandy gravel
Ironstone gravelly pale deep sand (1485)	30	Deep sandy gravel, may also include Ironstone gravelly acid deep sand
Pale deep sand (1487)	35	Acid deep sand, Pale deep sand, Any deep sand soil group, may also include Black deep sand, Ironstone gravelly coloured deep sand, Ironstone gravelly acid deep sand
Pale sandy earth (1465)	5	Acid sandy earth,Grey shallow sandy earth, Ironstone gravelly pale sandy earth
Pale shallow sand (1405)	5	Very shallow soil, Ironstone gravelly shallow sand
Yellow deep sand (1489)	20	Acid deep sand, may also include Black deep sand, Ironstone gravelly coloured deep sand, Ironstone gravelly acid deep sand

Closest match - WA soil group and Australian soil classification (order and suborder only)

WA soil group and qualifier	Pct	Order	Suborder
Deep sandy gravel (1211), poor sand, very deep	5	Arenosol	Red
Ironstone gravelly pale deep sand (1485), poor sand, very deep	30	Arenosol	Bleached
Pale deep sand (1487), good sand, very deep	35	Arenosol	Grey
Pale sandy earth (1465), acid to neutral subsoil with good permeability	5	Kandosol	Grey
Pale shallow sand (1405), poor sand	1.5	Rudosol	Arenic
Pale shallow sand (1405), poor sand	3.5	Tenosol	Bleached-Leptic
Yellow deep sand (1489), fair sand, very deep	15	Arenosol	Yellow
Yellow deep sand (1489), poor sand, very deep	5	Arenosol	Yellow

From: Karen McKeough <karen.mckeough@dwer.wa.gov.au>
Sent: Tuesday, 5 August 2025 4:11 PM
To: General <general@threesprings.wa.gov.au>
Subject: Proposed Renewable Energy Facility (Solar Farm, Battery Energy Storage System & Substation) - Lot 10896 Turkey Flat Road, Kadathinni

OFFICIAL

Our ref: PA 73754 / DWERVT73754

Dear Keith,
Thank you for providing the proposed renewable energy facility for the Department of Water and Environmental Regulation (DWER) to consider. I apologise for not providing this advice by the requested due date.

DWER has identified that the proposed activity has the potential for impact on environment and water resource values. Key issues and recommendations are provided below, and these matters should be addressed:

Noise Assessment
The noise assessment report has been reviewed by DWER Environmental Noise branch. The full review is attached, and the following summary is provided.
The acoustic assessment report prepared by SLR for the proposed Killawarra solar and battery energy storage system presents preliminary findings based on early-stage design inputs, which may not sufficiently demonstrate compliance with the Noise Regulations due to several critical gaps discussed above. It may be appropriate for the proponent to address these critical gaps and rerun the noise modelling once the detailed design information is available.

Groundwater Licensing
Should the proponent seek to obtain groundwater, the site occurs within the proclaimed Arrowsmith Groundwater area and subject to licensing requirements under the *Rights in Water and Irrigation (RIWI) Act 1914*.
As such, a licence will be required to construct and/or alter a well and to abstract water.
It is recommended that the proponent contact the Mid-West Gascoyne Water Licensing team on 9965 7400 or midwestgascoyne@dwer.wa.gov.au regarding any groundwater licensing requirements.

Native vegetation protection
Although the proposal site is located on cleared agricultural land, the applicant is reminded that under section 51C of the *Environmental Protection Act 1986* (EP Act), clearing of native vegetation is an offence unless:

- it is undertaken under the authority of a clearing permit,
- it is done after the person has received notice under Section 51DA(5) that a clearing permit is not required,
- the clearing is subject to an exemption.

Exemptions for clearing that are a requirement of written law, or authorised under certain statutory processes, are contained in Schedule 6 of the EP Act. Exemptions for low impact routine land management practices outside of environmentally sensitive areas (ESAs) are contained in the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (the Clearing Regulations).
Information on exempt activities and application forms are available here Native vegetation clearing permit forms | Western Australian Government (www.wa.gov.au)
If further clarification is required, please contact the Department's Native Vegetation Regulation section by email admin.nvp@dwer.wa.gov.au or by telephone 6364 7098.

Stormwater management plan
DWER notes that the applicant has considered the preparation of a Stormwater Management Plan can be prepared as a condition (of DA approval) if required. DWER recommends that due to the changed land use having the potential to generate increased surface water runoff,
that a Stormwater Management Plan be developed that includes an objective that ensures there is no sediment exported from the site.

DWER should be notified of any modifications to the proposal that may have implications on aspects of environment and/or water management, to enable the implications to be assessed.
Please be advised that the preferred contact details for the regional DWER office is midwestgascoyne@dwer.wa.gov.au and correspondence should be sent to this address to enable a prompt response.

Please contact me if you require any further information on these comments.

Yours sincerely,
Karen McKeough
Program Manager Planning Advice
Mid West Gascoyne Region
Approvals – Statewide Delivery

Department of Water and Environmental Regulation
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Government of **Western Australia**
Department of **Water and Environmental Regulation**

Technical (Review) Report

Advice on the acoustic assessment report for the Killawarra solar and battery energy storage system, Lot 10896 Turkey Flat Road, Kadathinni, prepared for the Shire of Three Springs

Department of Water and Environmental Regulation

August 2025

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Acknowledgements

For more information about this report, contact

Environmental Noise, Department of Water and Environmental Regulation.

Document control

Document version history

Version	Date	Description	Author	Reviewer
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File number and/or name	File owner or custodian
PA 73754 / DWERVT1081-6~1	Planning advice, Midwest Gascoyne Region

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Signature 	Date 04/08/2025

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Position title	Senior Environmental Noise Officer
Signature 	Date 04/08/2025

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1. Introduction

This advice has been prepared for the Shire of Three Springs in response to a request for comment made to the Department of Water and Environmental Regulation (DWER) on the acoustic assessment in relation to the proposed solar farm and Battery Energy Storage System (BESS) to be located at lot 10896 Turkey Flat Road, Kadathinni.

2. Documentation

The following documents were referred to and formed the basis of this technical expert advice.

Material / document name	Author	Date
Development Application: Renewable Energy Facility (Solar Farm, Battery Energy Storage System and Substation) – Lot 10896 Turkey Flat Road, Kadathinni	element	4 June 2025
Noise Assessment: Killawarra Solar and BESS (Report 675.072651.00001) – prepared for Trina Solar	SLR	1 April 2025

3. Advice

DWER's Environmental Noise Branch (ENB) has reviewed the Development Application document, as well as the Noise Assessment report prepared by SLR for the solar farm and BESS.

SLR concludes in the Noise Assessment report that noise emissions from the Project are predicted to comply with the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations). It is noted the SLR's report is prepared based upon preliminary plans provided to them. SLR also indicates that any changes made to the design, layout or equipment specification may result in changes to the noise emissions, which in turn will necessitate the noise modelling needing to be reviewed.

ENB would make the following comments:

1. Table 4 outlines the sound power levels of the various noise sources which were used as inputs into the noise model, with additional detail found in Section 1.2 of the

report. Only limited make and model numbers are identified in the report, resulting in uncertainty on what specifically is proposed to be installed. Without such information ENB is unable to comment on whether the equipment sound power levels used in the noise model are appropriate. Understated sound power levels can result in an under prediction of the received noise level.

2. The SLR report does not consider in the noise prediction model the potential for tonality (i.e. a hum or whine-type noise) to be present. Noise emissions from fans and transformers commonly contain tonal qualities and is a relevant consideration in this case. When noise being received at the receiving premises contains identifiable tones, a +5 dB adjustment is required to be made to the received level (in this case, the modelled level) prior to assessing against the assigned levels specified in the Noise Regulations. Should the conservative position be taken and a tonality adjustment be applied, non-compliance would be expected at R1 in the region of 4 dB at night when considering the values contained in Table 7.

3. It is observed in Figure 2 of the report the facility is to include a series of fire water tanks distributed throughout the site. Noise contributions from the pumps associated with the fire water tanks is not considered in the SLR report. It is not known what the intended power source for the pumps will be, however internal combustion motors may be considered - as the electrical supply may be isolated in the event of an emergency. Should this be the case, it would be appropriate to model the noise emissions from routine fire pump testing. Since it is foreseen that such equipment will be needed and require regular testing, the fire pumps and their associated equipment should be designed to comply with the Noise Regulations.

4. Figure 2 of the report provides a site plan for the proposed development. It is unclear from the report if it includes the infrastructure within the Western Power switching station and plant substation (i.e. what Trina solar may be responsible for as opposed to possibly Western Power). Figures 3 and 4 suggests the Western Power infrastructure may be included, however uncertainty remains. The report would benefit from providing greater clarity about what infrastructure forms part of the assessment, and what potential elements may not.

5. Table 5 of the report outlines a number of modelled scenarios, specifically relating to modelled fan speeds for various pieces of equipment and how this may vary between day and evening - as compared to nighttime periods. The notes within Table 7 seek to justify either nil or reduced fan speeds through a combination of no sunlight and/or cooler temperatures. It is noted in Table 1 of the Noise Regulations that the nighttime assigned levels are applicable up until 0700 Monday to Saturday and 0900 on Sundays and public holidays. It is therefore unclear if consideration has been given to expected fan speeds on Sundays and public holidays for nighttime periods extending to 0900 during the warmer months - when the sunrise is generally earlier and the ambient temperatures are higher than in winter.

6. There is an inconsistency between Table 7 and Figure 4. While Table 7 indicates that nighttime noise levels are predicted to be 34 dB(A) at R1 and 30 dB(A) at R2, modelled noise contours in Figure 4 seem to indicate that nighttime noise levels will be below 30 dB(A) at both of these two nearest residences.

7. SLR indicates that background noise levels can be as low as 20 dB(A) during day or night periods in the area, when windspeed is low or calm. Hence, noise generated from the proposed project can be very significant at the nearest neighbouring residence, where the predicted operational noise level will be 34 dB(A) at night. Such a significant increase from the background noise is likely to result in noise complaints from the affected residents, even though compliance with the Noise Regulations is achieved. The proponent may need to look at the opportunities to minimise the noise impact on the two nearest residences (R1 and R2), such as relocating the BESS system and the associated Western Power substation farther away from them.

In summary, the acoustic assessment report prepared by SLR for the proposed Killawarra solar and battery energy storage system presents preliminary findings based on early-stage design inputs, which may not sufficiently demonstrate compliance with the Noise Regulations due to several critical gaps discussed above. It may be appropriate for the proponent to address these critical gaps and rerun the noise modelling once the detailed design information is available.

4. Limitations

Technical expert advice in any field is subject to various limitations. Important limitations to the advice include:

- No computer modelling was undertaken to verify SLR's modelled noise results.

Schedule of Submissions – Proposed Renewable Energy Facility (Solar Farm, BESS and Substation) – DAP/25/02930 | Lot 10896 Turkey Flat Road, Kadathinni				
Submission & Date Received	Respondent	Summary of Submission	Comment	Shire Recommendation
1 (18/7/25)	ATCO	No objection to the proposal. 2 advice notes provided: • Anyone proposing to carry out construction or excavation works must contact 'Before You Dig Australia' (www.byda.com.au) to determine the location of buried gas infrastructure. • Proposed construction and excavation works need to be managed in accordance with the ATCO document Additional Information for Working Around Gas Infrastructure - AGA-O&M-PR24 https://www.atco.com/en-au/for-home/natural-gas/wa-gasnetwork/working-around-gas.html	Copy of ATCO submission was provided to the applicant to ensure they are aware of their Before Your Dig requirements prior to commencement. The applicant advised as follows in relation to this submission: *"The applicant accepts this advice being provided on a development approval as advice notes (if required)."* In the event that the application is approved it is recommended that the following advice note be included with the determination: *"(d) The applicant is advised that this planning approval does not negate the requirement for any additional approvals, and adherence to due diligence, which may be required under separate legislation. This including, but not limited to, the obtaining of any required approvals from the Department of Health, the Department of Energy, Mines, Industry Regulation & Safety, the Department of Water & Environment Regulation and Main Roads WA and consulting of Before You Dig Australia. It is the applicant's responsibility to obtain any additional approvals, and undertaking of due diligence, required before the development/use lawfully commences."*	Note submission and include advice note as outlined in comment section.
2 (23/7/25)	Main Roads Western Australia (MRWA)	Lot 10896 is not located within or adjacent to a road reserve under MRWA's jurisdiction. Additionally, MRWA has no current plans in the area that would affect the Lot. Accordingly, MRWA does not object to the proposal and provides the following comment: A Traffic Management Plan in conjunction with an application for a permit that requires vehicle and machinery access and movement for Restricted Access Vehicles shall be submitted for approval to the satisfaction of Heavy Vehicle Services MRWA (e.g. large transformers).	Copy of MRWA submission was provided to the applicant who advised as follows in relation to this submission: *"The applicant accepts MRWA's recommended advice being provided on a development approval as an advice note (if required)."* In the event that the application is approved it is recommended that the following conditions be included with the determination: *"5. Prior to the commencement of the development a Construction Management Plan shall be submitted to the local government for approval.* *6. The landowner shall implement, and adhere to at all times during construction, the recommendations of the approved Construction Management Plan to the satisfaction of the local government.* *12 The upgrading of the Eneabba-Three Springs Road and Turkey Flat Road intersection to the satisfaction of the local government* *16. The landowner shall be responsible for the repair, reinstatement or replacement of any road infrastructure that is damaged, becomes unsafe or fails to meet appropriate engineering standards where the damage to the road network is caused by reason of use of the road*	Note submission and approve application subject to conditions and advice notes as outlined in comments section.

			in connection with the approved development, and within a timeframe, to the satisfaction of the local government (or where agreed to by the local government the applicant may instead arrange payment to the local government for such repair, reinstatement or replacement works to be undertaken).” It is also recommended that the following advice notes be included with the determination: *“(e) The applicant will need to consult with the Main Roads WA Heavy Vehicle Services branch to ascertain any approval requirements that may be required for their proposed heavy vehicle combinations, transport routes and operations.* *(g) In relation to conditions 5 & 6 the Construction Management Plan shall address the following associated with the construction of the development or any other matters considered relevant by the local government.* *i) hours of construction;* *ii) heritage management protocols to mitigate potential risks linked to the exposure of Aboriginal artefacts during ground-disturbing activities;* *iii) temporary fencing, hoardings, gantries, and signage;* *iv) site access and egress;* *v) construction vehicle route and traffic management;* *vi) size and frequency of construction vehicles;* *vii) road upgrades/repairs and timing of works associated with the construction of the development;* *viii) parking arrangements for staff and contractors;* *ix) deliveries and storage of construction materials and machinery;* *x) management of vibration, dust, wind, and erosion;* *xi) management of any stormwater discharge;* *xii) management of construction noise and other site generated noise;* *xiv) demolition and construction waste management, recycling, and removal;* *xv) protection of any public realm infrastructure;* *xvi) public communication and complaint handling procedures.*	

Schedule of Submissions – Proposed Renewable Energy Facility (Solar Farm, BESS and Substation) – DAP/25/02930 | Lot 10896 Turkey Flat Road, Kadathinni				
Submission & Date Received	Respondent	Summary of Submission	Comment	Shire Recommendation
			(h) The Shire is unable to provide guarantee of all-weather access on its unsealed road network, and in the event that the applicant requires all-weather access to its site, the applicant is required to seal the road network to the local government's satisfaction to connect into the existing sealed road network. *(k) In relation to condition 12 the Eneabba-Three Springs Road/ Turkey Flat Road intersection shall be upgraded with Basic Right Turn (BAR) and Basic Left Turn (BAL) treatments to improve road safety, and Turkey Flat Road is to be sealed for a distance of 50m south of the Eneabba-Three Springs Road intersection to minimise the migration of gravel from Turkey Flat Road onto Eneabba-Three Springs Road."*	
3 (23/7/25)	Water Corporation	Water Corporation has no objections. No water or wastewater services, or other Water Corporation assets are in the area. The developer is proposing onsite services including waste containment and removal.	In the event that the application is approved it is recommended that the following condition be included with the determination: *"11. The design, location, installation and maintenance of on-site wastewater/effluent systems is to be to the approval of the local government and in accordance with relevant legislative requirements."*	Note submission and approve application subject to condition as outlined in comments section.
4 (28/7/25)	Telstra	Telstra has no objections to the proposal. Telstra can utilise statutory notices in the future if it wants to access the land for the purposes of any inspection, maintenance and installation of low impact facilities.	No additional comment.	Note submission
5 (29/7/25)	Department of Biodiversity, Conservation and Attractions (DBCA)	DBCA supports the recommendation by SLR Consulting (2025) to undertake an in season targeted survey in the adjacent roadside vegetation should the 2 current driveway access points not be used for the proposed project, to identify potential occurrences of *Grevillea erinacea* P3. The surrounding remnant vegetation is considered to hold high biodiversity value, providing suitable habitat for threatened and priority flora species. Roadside remnant vegetation adjacent to the Eneabba-Three Springs Road/Turkey Flat Road intersection and the section on Turkey Flat Road proposed to be upgraded may provide suitable habitat for conservation significant species. It is recommended that consideration is given to roadside	Copy of DBCA submission was provided to the applicant who advised as follows in relation to this submission: *"The proponent is aware of their obligations with respect to the requirement for a clearing permit.* *If it is determined at the detailed design phase that the 2 current driveway access points are not suitable and/or require widening, which necessitates clearing and a clearing permit is required from the DWER under Part V of the Environmental Protection Act 1986; then one will be obtained at this time. It will be informed by an in season targeted survey as required.* *The applicant accepts that any new additional planting that is required to support the project is to use species of local provenance."*	Note submission and approve application subject to conditions and advice note as outlined in comments section.

		vegetation during the planning and implementation of proposed road upgrades for the project. Should vegetation clearing be proposed, it should be noted that the clearing of native vegetation requires a Native Vegetation Clearing Permit obtained from DWER, unless of a kind that is exempt in accordance with Schedule 6 or Regulation 5 (Clearing of Native Vegetation Regulations) of the *Environmental Protection Act 1986*. Should the mitigation measure recommended in the Visual Impact Assessment to plant native shrubs along the Eneabba-Three Springs Road (northwestern) side of the lease area be considered to minimise visual impact of the project, consideration should be given to using species of local provenance.	In the event that the application is approved it is recommended that the following condition be included with the determination: *"3. Prior to the commencement of development, a Landscape Plan shall be submitted to the local government for approval.* *4. Prior to the commencement of the use the landowner shall implement and thereafter maintain for the lifetime of the development the recommendations of the approved Landscape Plan to the satisfaction of the local government."* It is also recommended that the following advice note be included with the determination: *"(f) In relation to conditions 3 & 4 the Landscape Plan shall address the mitigation measures as outlined in the Visual Impact Assessment."*	
6 (29/7/25)	Department of Mines, Petroleum and Exploration (DMPE)	DMPE has determined that this proposal raises no significant issues with respect to mineral and petroleum resources, geothermal energy, and basic raw materials. DMPE lodges no objections to the development application.	No additional comment.	Note submission
7 (30/7/25)	Mid West Development Commission (MWDC)	MWDC is supportive of initiatives that align with our strategic objectives, including the development of renewable energy projects in the Mid West region, as per our 2023-26 Strategic Plan Initiative 1.2.1: Facilitate green energy production and transmission for domestic supply and export industry. MWDC has been briefed by Trina Solar on this project. We also understand that Trina Solar has undertaken consultation with the local community as part of the project's planning process. Through our own engagement across the North Midlands we note that there is strong desire from communities to ensure that projects provide a material return back to host communities, and the broader region. We support this general proposition, as envisaged in PoweringWA's recently	Copy of MWDC submission was provided to the applicant who advised as follows in relation to this submission: *"There is no specific planning policy requirement that triggers a financial contribution to be made through the development application process. Community benefits are therefore outside the scope of this development application and cannot be conditioned on the development approval.* *The Draft Guideline on Community Benefits for Renewable Energy Projects as released recently by PoweringWA represents a whole of Government policy position rather than a statutory planning requirement. This document is also still in draft and is currently undergoing consultation.* *As noted in the Engagement Summary Report prepared for Trina Solar and included in the development application, further consultation is required to determine the community benefits associated with this project. Recognising this, the applicant would accept an appropriate advice note on the approval which provides as follows:*	Note submission and include advice note as outlined in comment section.

		released Draft Guideline on Community Benefits for Renewable Energy Projects. With multiple new renewable energy projects existing and proposed for the North Midlands, gaining and maintaining social licence will be important for both individual projects and the energy sector at large. As such, we are generally supportive of the proposed project at Lot 10896 Turkey Flat Road but highlight the value of meaningful community engagement from proponents, and the use of community benefit frameworks - or similar mechanisms - that deliver tangible benefits back to host communities, and the Mid West region.	*"The applicant is advised that separate discussions should progress with the Shire of Three Springs regarding the community benefits to be delivered by this project for the benefit of the local community."* *The advice note recognises that discussions need to continue (separate to the development application process) with the Shire regarding community benefits."* The planning system is failing rural and regional communities in regards to large gas, renewable energy and mineral projects. Whilst it is recognised that these projects may have a wider state benefit, there can be a very limited to negative return for the communities in which these projects operate. It is also recognised that whilst major projects do have an underlying objective of maximising the proponent's interests there is still ability for it to have regard and concern for the wider social context of the region in which it is located. Without such regard it might be asked; *if the project were to not proceed would the local community be any the worse off?*, indeed it might be better off as the local community will bear the impacts to its own transport activities and networks, particularly during the construction phase, the impact on its rural amenity through visual, noise, dust and light impacts, and the environmental risks both during the operation and post-operation legacy phases when a proponent, who is from outside the region, has made their profits and moved on. There is no statutory planning mechanism by which a significant applicant must be involved in the local community and to ensure there is some form of social benefit to those who will bear the impacts and who are already disadvantaged in access to services and facilities compared to urban areas. It is imperative that the State Government in consultation with WALGA develop a mechanism whereby major project proponents are required to engage with local communities to ensure a lasting positive community legacy for their projects. Delay in this area in the face of the current significant activity in the gas and renewable energy sectors in rural and regional areas is resulting in poor outcomes for these disadvantaged areas and reinforces an underlying trend of centralisation. In the event that the application is approved it is recommended that the following condition should be included with the determination:	

			*"(m) The applicant shall enter into a contribution agreement towards community, social or other infrastructure/programs that will benefit the local community. The agreement should establish the process by which the contributions should be directed to the Shire of Three Springs Medical Community Benefit Scheme or other local groups/ventures deemed appropriate. The agreement should give due regard for best available practice including the Draft Western Australia Guidelines on Community Benefits for Renewable Energy Projects and the contribution value per megawatt ($/MW) formula benchmark of the New South Wales Benefit Sharing Guideline."* This advice note is similar to the community benefit advice notes that were applied to other recent DAP determinations in the Shire of Three Springs for a Power Generation application on 13/11/24 (DAP/24/02759) and a Power Transmission alignment on 15/1/25 (DAP/24/02787). However, the wording has been expanded to give regard for the State Government's recent release of the Draft Guidelines on Community Benefits for Renewable Energy Projects. These Draft Guidelines can be viewed at the following link: download The officer recommendation to DAP also references the NSW Benefit Sharing Guideline which goes further than the draft WA Guidelines by stating the following ceiling contribution value per megawatt ($/MW): • $850 per megawatt per annum for solar energy development, or • $1,050 per megawatt per annum for wind energy development, or • $150 per megawatt hour per annum for stand-alone battery energy storage systems located in a rural zone https://www.planning.nsw.gov.au/sites/default/files/2024-11/benefit-sharing-guideline.pdf	
8 (31/7/25)	Department of Fire and Emergency Services (DFES)	DFES notes the current version of SPP3.7 and the Guidelines no longer makes reference to 'high risk land use'. The decision maker has referred this proposal to DFES as a discretionary referral. DFES considers that SPP3.7 and the Guidelines do not adequately address high risk land use such as renewable energy facilities. Given the temperature sensitive nature of the infrastructure, it is critical to ensure	Copy of DFES submission was provided to the applicant who advised as follows in relation to this submission: *"The minor modifications DFES has requested of the BMP are generally administrative and/or minor and, as stated by DFES, they will not impact on the design of the proposal. Accordingly, these modifications are appropriate to undertaken following the approval of the development and can be implemented via a condition of approval to be satisfied prior to*	Note submission and approve application subject to conditions and advice note as outlined in

		that the proposed design adequately responds to bushfire risks in order to protect life, property and infrastructure. Accordingly, DFES has also assessed the proposal against the CFA Design Guidelines and Model Requirements – Renewable Energy Facilities as amended (REF Guidelines) which is currently considered best practice for the development of renewable energy facilities. Specific requirements of SPP3.7 and the supporting Guidelines and the REF Guidelines are to be further addressed in the BMP as outlined in the provided assessment (table can be viewed within the DFES submissions provided in Attachment 2 to the DAP report). The assessment comments relating to the REF Guidelines have been incorporated into the below overall assessment comments for the respective issue/element.	*the issue of a building permit. Suggested condition wording is provided below:* *Prior to the commencement of works associated with the approved development or the issue of a Building Permit (whichever occurs first), the Bushfire Management Plan prepared by Linfire Consultancy (dated 27 March 2025) must be amended and submitted to and approved by the Shire of Three Springs, to provide details of the following:* *a. administrative changes required as follows:* *Photo points are to be added to Figure 4 so that the photographic evidence can be correlated with the Vegetation and Effective Slope Map (Figure 4).* *b. Further evidence to support the proposed vegetation exclusion of Plot 8 as non-vegetated or managed to low threat in accordance with AS3959 is required. Specifically, that the necessary permissions from Western Power will be obtained for ongoing vegetation management on the Western Power controlled land; and that the vegetation within the solar photovoltaic arrays will be managed to a 'minimal fuel condition' under AS3959. If unsubstantiated, the vegetation should be classified as per AS3959.* *In relation to DFES' comments on the Bushfire Risk Management Plan (BRMP) relating to the internal road specifications; it is noted that these are proposed to comply with the private driveway specifications of the WA Guidelines, rather than the CFA Guidelines from Victoria. This is appropriate for the site.* *The applicant accepts DFES's advice to provide further details on the detailed design of the BESS including containment measures, battery management system, fire, vapour and gas detection arrangements and trip or alarm criteria and responses (i.e. what shuts down the system automatically, what isolates sections of the BESS, what initiates a company remote on call staff member to log in and check the BMS or to attend the site, what will initiate an emergency call to DFES) within the BRMP. These matters all relate to detailed design and are appropriate to provide following the approval of the development as a condition to be satisfied prior to the issue of a building permit. Suggested condition wording is provided below:*	comments section.

			Prior to the commencement of works associated with the approved development or the issue of a Building Permit (whichever occurs first), the Bushfire Risk Management Plan prepared by Linfire Consultancy (dated 27 March 2025) must be amended and submitted to and approved by the Shire of Three Springs, to provide specific details of the following: *a. Containment measures for the BESS for fire water, chemical spills or leaks;* *b. Battery management system for the BESS; and* *c. The fire, vapour and gas detection arrangements and trip or alarm criteria and responses for the BESS.* *The applicant also accepts DFES's advice to consult with the DFES District Officer responsible for the region and the local fire and emergency services during the development, construction, and leading up to the commissioning of the facility. It would be appropriate that this is included as an advice note on the approval."* In the event that the application is approved it is recommended that the following condition be included with the determination: *"9. Prior to commencement of the development an updated Bushfire Management Plan and Bushfire Risk Management Plan shall be submitted to the local government for approval on advice of the Department of Fire and Emergency Services.* *10. Prior to the commencement of the use the landowner shall implement and thereafter maintain for the lifetime of the development the recommendations of the approved Bushfire Management Plan to the satisfaction of the local government."* It is also recommended that the following advice note be included with the determination: *"(i) In relation to conditions 9 & 10 the Bushfire Management Plan and Bushfire Risk Management Plan shall address the issues raised by the Department of Fire & Emergency Services and any other matters considered relevant by the local government."*	
9 (1/8/25)	Western Power	No objections to the proposal with comments and recommendations as follows. While the customer has been progressing with Western Power, the proposed Western Power managed assets	Copy of Western Power submission was provided to the applicant who advised as follows in relation to this submission:	Note submission and include advice notes as outlined in

		demarcated on the site plan are indicative only. Prior to commencement of works, the proponent shall ensure that the connection, location, design, access and ongoing maintenance and operations of assets is supported and agreed with Western Power. Please find attached the following advice notes of relevance to the proposal: (i) The development shall be designed and constructed to protect Western Power infrastructure and interests from potential land use conflict. (ii) No development (including drainage, fill, fencing, storage or parking) will be permitted within Western Power line and cable easements or restriction zones without the prior written approval of Western Power. (iii) The applicant should formally progress the Western Power network connection and substation arrangements with Western Power. (iv) Arrangements being made to the specifications of Western Power for the provision of necessary electricity easements as and where required.	*"Western Power's comments are noted. The applicant accepts Western Power's recommended advice being provided on a development approval as advice notes (if required)."* In the event that the application is approved it is recommended that the following advice note be included with the determination: *"(b) The applicant is advised that the proposed works are near an area of high risk. It is recommended that persons planning to build or undertake works in high risk areas near transmission or communication assets act in a safe manner at all times and in accordance with all applicable legal and safety requirements (including the 'duty of care' under the laws of negligence, Worksafe requirements and guidelines, Australian Standards and Western Power policies and procedures).* *(d) The applicant is advised that this planning approval does not negate the requirement for any additional approvals, and adherence to due diligence, which may be required under separate legislation. This including, but not limited to, the obtaining of any required approvals from the Department of Health, the Department of Energy, Mines, Industry Regulation & Safety, the Department of Water & Environment Regulation and Main Roads WA and consulting of Before You Dig Australia. It is the applicant's responsibility to obtain any additional approvals, and undertaking of due diligence, required before the development/use lawfully commences."*	comment section.
10 (1/8/25)	Department of Health (DoH)	DoH has no objection to the proposal with comments and recommendations as follows: The site is not recorded on the Contaminated Sites database. The proponent should obtain a Basic Summary of Records relating to the land and its surroundings to complete their assessment of the site's suitability for the proposed development. For any future rehabilitation of the site, it is important that enough time and resources are set aside to properly carry out investigations, assess any risks, and complete remediation work. These activities should follow the	Copy of DoH submission was provided to the applicant who advised as follows in relation to this submission: *"DoH's advice regarding the need for a Basic Summary of Records is noted. The applicant accepts this condition as recommended by DOH (if required).* *DoH's advice regarding future rehabilitation is noted. It is recommended that the requirements to plan for the future rehabilitation of the site be dealt with via an appropriate condition of approval that requires the preparation of a Decommissioning Plan for the site.* *A Decommissioning Plan can set out the manner in which infrastructure is to be removed from the site and how the site is to be restored and/or*	Note submission and approve application subject to conditions and advice note as outlined in comments section.

		guidelines set out in the National Environment Protection (Assessment of Site Contamination) Measure (NEPM(ASC)M). The DoH recommends that the proponent is made aware of their legal duty under Section 11 of the *Contaminated Sites Act 2003*. If the owner or occupier knows or suspects that the site may be contaminated—as defined in Section 4 of the Act—they must report this to DWER as soon as possible. This will ensure that any potential risks to human health or the environment are managed appropriately and in line with regulatory requirements. BESS' may pose a fire risk. Suitable measures should be put in place to prevent fires and manage any potential impacts on public health. The DoH recommends that this should include an investigation into any toxic emissions that could be released during a fire. It is also important to assess how these emissions might spread and affect nearby residential areas. EPA (2005) guideline "Separation Distances between Industrial and Sensitive Land Uses" (Section 2.1) recommends that appropriate separation/buffer distances should be established around land uses where there may be significant offsite impacts, including power generation facilities. The DoH recommends that the potential off-site impacts (noise) from the project is considered, prior to determining the suitability of the site, to minimise public health risks arising. The proponent must apply to the Shire for any onsite wastewater treatment systems and holding tank/s. This will be accompanied by a site-specific Site and Soil Evaluation (SSE) undertaken by a qualified consultant during the wettest seasonal time of the year (mid-July/August) as per AS/NZS 1547:2012 and detailed plans to scale showing the proposed building envelopes, proposed onsite wastewater system locations and land application areas, all trafficable areas, parking bays including setback distances to	*used thereafter and going forward. The Decommissioning Plan will address risk management and compliance with relevant regulations. Suggested condition wording is provided below:* *The applicant is required to provide at least 3 months' notice to the local government if the proposed development is to cease operations and all infrastructure must be decommissioned and removed from the site. The site must be demonstrated to be free of contaminants and the site rehabilitated through deep ripping/earthworks, and other measures as included in the approved Final Decommissioning Plan to the satisfaction of the local government.* *DoH's comments regarding fire risk associated with a BESS are noted. Fire risks are being managed through the BRMP.* *DoH's comments regarding the EPA (2005) guideline "Separation Distances between Industrial and Sensitive Land Uses" is noted. This guideline addresses the generic separation distances that may be needed between industrial and sensitive land uses to avoid conflicts between these land uses. The generic distances are considered appropriate in the absence of a more specific technical study. The guidelines acknowledge that a sound site-specific technical analysis is generally found to provide the most appropriate guide to the separation distance that should be maintained between an industry or industrial estate and sensitive land use. In this case the development application is accompanied by a Noise Assessment completed by SLR that demonstrates that noise emissions are predicted to comply with the Environmental Protection (Noise) Regulations 1997. Accordingly, the proposed separation distances are appropriate.* *DoH's comments on wastewater disposal are noted. The applicant accepts this advice being provided on a development approval as advice notes (if required)."* In the event that the application is approved it is recommended that the following conditions be included with the determination: *"11. The design, location, installation and maintenance of on-site wastewater/effluent systems is to be to the approval of the local*	

		exclusion/riparian zones/flood zones (100m) with all measurements provided.	*government and in accordance with relevant legislative requirements.* 17. *Prior to the commencement of operations, an Operational Management Plan shall be submitted to the local government for approval, which includes the establishment of a complaints register to record any complaints that may be received and process for undertaking any mitigating actions that may be required.* 18. *The measures included in the approved Operational Management Plan shall be implemented to the satisfaction of the local government.* 20. *Prior to commencement of operations a Preliminary Decommissioning Plan shall be submitted to the local government for approval.* 21. *The applicant is required to give at least 3 months' notice to the local government if the proposed development is to cease operations and all infrastructure must be decommissioned and removed from the site. The site must be demonstrated to be free of contaminants and the site rehabilitated through deep ripping/earthworks, and other measures as included in the approved Final Decommissioning Plan to the satisfaction of the local government, within 2 years of giving this notice, unless the local government agrees otherwise."* It is also recommended that the following advice note be included with the determination: *"(j) In relation to condition 11 the applicant is advised that approval from the Department of Health is required for any on-site wastewater/effluent treatment processes."*	
11 (1/8/25)	Department of Primary Industries and Regional Development (DPIRD)	DPIRD's regional development portfolio is broadly supportive of the development application. However, given the scale of the project, with site lot area of 1,405ha and a development footprint of 620ha, DPIRD holds concerns as to the proponent's proposed plans to share project benefits with the host community. DPIRD notes that the proponent has contracted consultants SLR to engage with local government and the community via	Copy of DPIRD submission was provided to the applicant who advised as follows in relation to this submission: *"The applicant notes DPIRD's comments. Responses are provided below.* *<u>Housing</u>* *Housing employees and contractors during the construction and operational phases of the project is outside the scope of this development application. Nonetheless, Trina Solar will continue discussions with the Shire of Three Springs about its housing*	Note submission and approve application subject to conditions and advice notes as outlined in comments section.

		a formal community and stakeholder engagement program. This engagement included the MWDC and the Yamatji Southern Regional Corporation. SLR has identified the key issues raised through the consultation program. They have made recommendations to the proponent to continue to engage with the community and to establish a community benefit fund. It is unclear whether the proponent has committed to, or is planning on, acting on these recommendations. DPIRD recommends that the proponent familiarise themselves with the Clean Energy Council Best Practice Charter and consider applying these principals to strengthen social license and maximise regional benefits. DPIRD would like to see evidence from the proponent that they have a plan for: • How they will house workers during both construction and operational phases of the project given housing shortages in the region. • Guidelines as to how they will establish a community benefit fund including how proponent contributions will be determined. • Action to engage local contractors and provide local employment. • How they will work with neighbours to mitigate project impacts. Neighbours being farming properties adjacent to, and/or directly impacted by, the solar farm. <u>Agricultural Resource Management and Assessment</u> Soil-landscapes of the site are comprised of 3 subsystems. • Coalara 1 subsystem - Sand filled alluvial plain, low dunes common; pale and yellow deep sands, some playa soils	*requirements, separate to the development application process, as the project progresses towards construction and commissioning.* <u>*Community Benefits*</u> *There is no specific planning policy requirement that triggers a financial contribution to be made through the development application process. Community benefits are therefore outside the scope of this development application and cannot be conditioned on the development approval.* *As noted in the Engagement Summary Report prepared for Trina Solar and included in the development application, further consultation is required to determine the community benefits associated with this project. Recognising this, the applicant would accept an appropriate advice note on the approval which provides as follows:* *The applicant is advised that separate discussions should progress with the Shire of Three Springs regarding the community benefits to be delivered by this project for the benefit of the local community.* *The advice note recognises that discussions need to continue (separate to the development application process) with the Shire regarding community benefits.* *Trina Solar is also exploring opportunities to engage with local contractors and businesses to support the construction and operation of the project. Trina Solar has a register for expressions of interest by local contractors and businesses so that they can be updated on future business participation opportunities for the project.* <u>*Neighbour Impacts*</u> *Impacts of the development to neighbours have been assessed through this development application.* <u>*Water and Wind Erosion*</u> *The applicant accepts a condition for a stormwater and erosion management plan as recommended by DPIRD if required.* <u>*Decommissioning*</u>	

		• Coalara 3 subsystem - Plateau remnants, hillcrests and very gently to moderately inclined hillslopes, some moderately inclined breakaway slopes; shallow and deep sandy gravel. • Coalara 7 subsystem - Upland sandplain; pale and yellow deep sands, gravelly pale deep sand. The soils of these systems can be challenging for agricultural purposes. The soils of these systems are prone to subsoil compaction and tend to repel water. For these soils: • 80-90%% have low to extremely low water storage capacity • 70-80% are acidic at depth, with the remainder at a high risk of becoming acidic • 95% have a high risk of wind erosion. While the risk of soil erosion is high if the soil is bare, DPIRD expects this is a risk to be managed during the construction/decommissioning phases. The establishment of groundcovers should manage this risk for the duration of this facility. As these soils are known to be acidic at depth, DPIRD recommends soil tests are conducted across the site to determine if any of the soil chemistry properties will impact engineering plans. The water erosion risk of these soils, when used for agricultural purposes, is considered low. However, DPIRD is aware that significant weather events, when combined with hard surfaces, will result in soil erosion. A review of the aerial photography confirms that there is a minor tributary that exists in the southeast corner of the site (Development Application, p4). In addition, the landscape shows another 4 drainage areas where water will be shed from the site during a significant rain event. DPIRD recommends that the proponent prepare management plans for both surface water and wind erosion, incorporating appropriate design methods	*As per the comments in relation to DOH's referral response, a Decommissioning Plan can set out the manner in which infrastructure is to be removed from the site and how the site is to be restored and/or used thereafter and going forward.* *The Decommissioning Plan will address risk management and compliance with relevant regulations.* *Despite DPIRD's comments concerning the agricultural capability of the soils in the area, it is not appropriate to determine the final land use now (25-30 years in advance). Although it is noted that providing for a return of the site for agricultural/grazing opportunities is considered to be appropriate (i.e. the existing, established, land use prior to the proposed development being constructed). Any alternative land uses would need to be considered in consultation with the landowner.* *Suggested condition wording is provided below:* *The applicant is required to give at least 3 months' notice to the local government if the proposed development is to cease operations and all infrastructure must be decommissioned and removed from the site. The site must be demonstrated to be free of contaminants and the site rehabilitated through deep ripping/earthworks, and other measures as included in the approved Final Decommissioning Plan to the satisfaction of the local government.* *<u>Biosecurity</u>* *Biosecurity protocols during construction can be addressed in the Construction Management Plan (CMP).* *Biosecurity protocols during ongoing operations can be addressed via an advice note. Suggested wording is provided below:* *The applicant is responsible to ensure that biosecurity protocols are maintained for the site to minimise biosecurity risks for the landowner, adjoining farms and along the transport route and should further information be required on appropriate practices the applicant should contact the Department of Primary Industries & Regional Development in this regard."*	

		to manage erosion risks from intense summer or winter weather events. A solar farm is currently expected to have an operational life of approximately 25-30 years. At the end of this period, DPIRD expects the facilities would either be upgraded to extend the solar farm's operational lifespan or be decommissioned, restoring the area to its previous land use. Given the Coalara 1 & 3 subsystem have been assessed to have low land capability, DPIRD suggests that when the facility is eventually decommissioned, it should be revegetated and restored to its original natural state. It is important to manage the biosecurity risks associated with the construction and ongoing operations of a solar farm. This will minimise the biosecurity risk for the landholder as well as for adjoining farms and along transport routes. DPIRD recommends that a Development Application include a biosecurity management plan to ensure that the proponent and its subcontractors adhere to biosecurity hygiene protocols and do not introduce or spread pests, weeds, or diseases when entering or leaving the proposed site.	The issue of community enhancement was discussed earlier in the comments section relating to Submission 7. In the event that the application is approved it is recommended that the following conditions be included with the determination: *"20. Prior to commencement of operations a Preliminary Decommissioning Plan shall be submitted to the local government for approval.* *21. The applicant is required to give at least 3 months' notice to the local government if the proposed development is to cease operations and all infrastructure must be decommissioned and removed from the site. The site must be demonstrated to be free of contaminants and the site rehabilitated through deep ripping/earthworks, and other measures as included in the approved Final Decommissioning Plan to the satisfaction of the local government, within 2 years of giving this notice, unless the local government agrees otherwise."* It is also recommended that the following advice note be included with the determination: *"(l) The applicant is responsible to ensure that biosecurity protocols are maintained for the site to minimise biosecurity risks for the landowner, adjoining farms and along the transport route and should further information be required on appropriate practices the applicant should contact the Department of Primary Industries & Regional Development in this regard.* *(m) The applicant shall enter into a contribution agreement towards community, social or other infrastructure/programs that will benefit the local community. The agreement should establish the process by which the contributions should be directed to the Shire of Three Springs Medical Community Benefit Scheme or other local groups/ventures deemed appropriate. The agreement should give due regard for best available practice including the Draft Western Australia Guidelines on Community Benefits for Renewable Energy Projects and the contribution value per megawatt ($/MW) formula benchmark of the New South Wales Benefit Sharing Guideline."*	

Schedule of Submissions – Proposed Renewable Energy Facility (Solar Farm, BESS and Substation) – DAP/25/02930 | Lot 10896 Turkey Flat Road, Kadathinni				
Submission & Date Received	Respondent	Summary of Submission	Comment	Shire Recommendation
12 (5/8/25)	Department of Water and Environmental Regulation (DWER)	DWER has identified that the proposed activity has the potential for impact on environment and water resource values. Key issues and recommendations are provided below, and these matters should be addressed: <u>Noise Assessment</u> The noise assessment report has been reviewed by DWER Environmental Noise branch (ENB). SLR concludes in the Noise Assessment report that noise emissions from the Project are predicted to comply with the *Environmental Protection (Noise) Regulations 1997*. It is noted the SLR's report is prepared based upon preliminary plans provided to them. SLR also indicates that any changes made to the design, layout or equipment specification may result in changes to the noise emissions, that will necessitate the noise modelling needing to be reviewed. ENB makes the following comments: Table 4 outlines the sound power levels of the various noise sources which were used as inputs into the noise model, with additional detail found in Section 1.2 of the report. Only limited make and model numbers are identified in the report, resulting in uncertainty on what specifically is proposed to be installed. Without such information ENB is unable to comment on whether the equipment sound power levels used in the noise model are appropriate. Understated sound power levels can result in an under prediction of the received noise level. The SLR report does not consider in the noise prediction model the potential for tonality (i.e. a hum or whine-type noise) to be present. Noise emissions from fans and transformers commonly contain tonal qualities and is a relevant consideration in this case. When noise being received at the receiving premises contains identifiable tones, a +5 dB adjustment is required to be made to the received level (in this case, the modelled level) prior to	Copy of DWER submission was provided to the applicant who advised as follows in relation to this submission: *"The applicant notes DWER's comments. Responses are provided below.* *<u>Noise Assessment</u>* *SLR has reviewed DWER's Environmental Noise branch's review of the SLR acoustic assessment and provided the following response.* *In relation to ENB point 1:* *Table 4 sound power data for the BESS/Solar inverters have been provided by Trina in the form of ISO3744:2010 acoustic test reports. Sub-station transformers have been modelled based on file data from measured 330kV transformers in Western Australia.* *In relation to ENB point 2:* *At the distances of receptors and the independent operation of the variable speed fans on the majority of equipment, no single frequency noise emission is expected to be dominant at the receptors. It is noted that predicted noise emissions at night have been revised in the report following identification of a transcription error. The highest predicted emission at night is an LA10 of 26dB, which has a margin of compliance*	Note submission and approve application subject to conditions and advice note as outlined in comments section.

		assessing against the assigned levels specified in the Noise Regulations. Should the conservative position be taken and a tonality adjustment be applied, non-compliance would be expected at R1 in the region of 4 dB at night when considering the values contained in Table 7. It is observed in Figure 2 of the report the facility is to include a series of fire water tanks distributed throughout the site. Noise contributions from the pumps associated with the fire water tanks is not considered in the SLR report. It is not known what the intended power source for the pumps will be, however internal combustion motors may be considered - as the electrical supply may be isolated in the event of an emergency. Should this be the case, it would be appropriate to model the noise emissions from routine fire pump testing. Since it is foreseen that such equipment will be needed and require regular testing, the fire pumps and their associated equipment should be designed to comply with the Noise Regulations. Figure 2 of the report provides a site plan for the proposed development. It is unclear from the report if it includes the infrastructure within the Western Power switching station and plant substation (i.e. what Trina solar may be responsible for as opposed to possibly Western Power). Figures 3 and 4 suggests the Western Power infrastructure may be included, however uncertainty remains. The report would benefit from providing greater clarity about what infrastructure forms part of the assessment, and what potential elements may not. Table 5 of the report outlines a number of modelled scenarios, specifically relating to modelled fan speeds for various pieces of equipment and how this may vary between day and evening - as compared to nighttime periods. The notes within Table 7 seek to justify either nil or reduced fan speeds through a combination of no sunlight and/or cooler temperatures. It is noted in Table 1 of the Noise Regulations that the nighttime assigned levels are applicable up until	*exceeding any potential adjustment for noise characteristic (should this be present).* *In relation to ENB point 3:* *It is understood that the fire water tanks are to provide water supply in the event of a nearby fire. The water would be distributed by local fire services, and also by a 1,000L trailer unit used during hot work activities. The fire consultant has indicated these tanks are not provided with fixed pump systems (such as applied to residential buildings). If there had been any fire pump testing, it would have occurred during the day period, and at the distances to receptors, be readily compliant with regulation 'Assigned Levels'.* *In relation to ENB point 4:* *Table 4 includes the sound power data modelled, which includes sub-station transformers. These would be managed by Western Power, so could have been excluded, but do not have a significant impact on emissions to receptors (contribution no greater than 14dB(A) and have been included for completeness.* *In relation to ENB point 5:* *The scenario of regulation night-time period concluding at 9am on Sundays and Public Holidays was considered but not documented in the assessment. Generally cooler conditions will prevail in this morning period, not requiring BESS and inverter high levels of cooling. Hot mornings can occur in the mid-west region in summer; however these are associated with easterly winds, which for this site will propagate noise away from the nearest key receptors. Solar availability is also limited,*	

Schedule of Submissions – Proposed Renewable Energy Facility (Solar Farm, BESS and Substation) – DAP/25/02930 | Lot 10896 Turkey Flat Road, Kadathinni				
Submission & Date Received	Respondent	Summary of Submission	Comment	Shire Recommendation
		0700 Monday to Saturday and 0900 on Sundays and public holidays. It is therefore unclear if consideration has been given to expected fan speeds on Sundays and public holidays for nighttime periods extending to 0900 during the warmer months - when the sunrise is generally earlier and the ambient temperatures are higher than in winter. There is an inconsistency between Table 7 and Figure 4. While Table 7 indicates that nighttime noise levels are predicted to be 34dB(A) at R1 and 30dB(A) at R2, modelled noise contours in Figure 4 seem to indicate that nighttime noise levels will be below 30dB(A) at both of these two nearest residences. SLR indicates that background noise levels can be as low as 20dB(A) during day or night periods in the area, when windspeed is low or calm. Hence, noise generated from the proposed project can be very significant at the nearest neighbouring residence, where the predicted operational noise level will be 34dB(A) at night. Such a significant increase from the background noise is likely to result in noise complaints from the affected residents, even though compliance with the Noise Regulations is achieved. The proponent may need to look at the opportunities to minimise the noise impact on the two nearest residences (R1 and R2), such as relocating the BESS system and the associated Western Power substation farther away from them. In summary, the acoustic assessment report prepared by SLR for the proposed Killawarra solar and battery energy storage system presents preliminary findings based on early-stage design inputs, which may not sufficiently demonstrate compliance with the Noise Regulations due to several critical gaps discussed above. It may be appropriate for the proponent to address these critical gaps and rerun the noise modelling once the detailed design information is available.	*therefore solar generation will be below maximum capacity. The scenarios modelled are considered representative of the site noise emissions and are considered to cover the 'worst case' combination of noise emissions and 'Assigned Level'.* *In relation to ENB point 6:* *Correct – the figures in Table 7 for Night-time scenario were in error, the noise contours are correct. The predictions of Table 7 have been corrected and re-issued (attached). The highest predicted noise emission at night if to receptor R1, at a level of LA10 of 26dB(A) (not 34dB(A) as previously reported).* *In relation to ENB point 7:* *The location of the BESS/substation was revised from the initial layout, moved away from key receptor R1. The (revised) predicted 'worst case' night scenario emission of LA10 26dB(A) is not expected to be strongly audible at receptor R1.* *The assessment references drawings provided which are titled Preliminary. However, the layout has undergone a number of revisions, so is interpreted as being a mature layout. The project noise emissions are shown to be less than the 'Assigned Level', with a generous compliance margin.* *A copy of the updated Noise Assessment (7/8/25) with the identified transcription error corrected is provided with this response.* *It is expected by the applicant that a standard condition will be applied to the approval that necessitated further updated noise assessment as the detailed design of the development progresses. Suggested wording is provided below:* *Prior to the commencement of works associated with the approved development or the issue of a Building Permit (whichever occurs first), the Noise Assessment shall be reviewed and submitted to, and approved by the Shire of Three Springs, in consultation with the Department of Water and Environmental Regulation.*	

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			The reviewed Environmental Noise Assessment shall include: *(a) Assessed noise levels for all nearby sensitive receivers.* *(b) Background noise levels.* *(c) Operating noise levels of equipment selected for installation.* *(d) Assessment of noise levels for worst-case scenario of night-time at 100% capacity operation.* *(e) Recommended measures to reduce noise level exceedances.* *Any recommended measures to reduce noise level exceedances identified in the approved reviewed Noise Assessment shall be implemented to the satisfaction of the Shire of Three Springs, in consultation with the Department of Water and Environmental Regulation, prior to the operation of the approved development.*	
		<u>Groundwater Licensing</u> Should the proponent seek to obtain groundwater, the site occurs within the proclaimed Arrowsmith Groundwater area and subject to licensing requirements under the *Rights in Water and Irrigation Act 1914*. As such, a licence will be required to construct and/or alter a well and to abstract water.	<u>*Groundwater Licensing*</u> *The applicant is aware of the Rights in Water and Irrigation Act 1914 (RIWI) requirements for a water licence. As noted in the development application material, water on the site will be supplied from a groundwater licence (GWL159202), which is currently in the process of being renewed. The licence allocation was previously for 5,500,000KL.*	
		<u>Native vegetation protection</u> Although the proposal site is located on cleared agricultural land, the applicant is reminded that under section 51C of the *Environmental Protection Act 1986* (EP Act), clearing of native vegetation is an offence unless: • it is undertaken under the authority of a clearing permit, • it is done after the person has received notice under Section 51DA(5) that a clearing permit is not required, • the clearing is subject to an exemption. Exemptions for clearing that are a requirement of written law, or authorised under certain statutory processes, are contained in Schedule 6 of the EP Act. Exemptions for low impact routine land management practices outside of environmentally sensitive areas (ESAs) are contained in the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004.*	<u>*Native Vegetation*</u> *The proponent is aware of their obligations with respect to the requirement for a clearing permit.* *If it is determined at the detailed design phase that the two current driveway access points are not suitable and/or require widening, which necessitates clearing and a clearing permit is required from the Department of Water and Environmental Regulation (DWER) under Part V of the Environmental Protection Act 1986; then one will be obtained at this time. It will be informed by an in season targeted survey as required.*	

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		<u>Stormwater Management Plan</u> DWER notes that the applicant has considered the preparation of a Stormwater Management Plan can be prepared as a condition (of DA approval) (if required). DWER recommends that due to the changed land use having the potential to generate increased surface water runoff, that a Stormwater Management Plan be developed that includes an objective that ensures there is no sediment exported from the site.	<u>*Stormwater Management*</u> *The applicant accepts a condition for a Stormwater Management Plan as recommended by DWER (if required)."* In the event that the application is approved it is recommended that the following conditions be included with the determination: *"7. Prior to commencement of the development a Stormwater Management Plan shall be submitted to the local government for approval.* *8. Prior to the commencement of the use the landowner shall implement and thereafter maintain for the lifetime of the development the recommendations of the approved Stormwater Management Plan to the satisfaction of the local government.* *17. Prior to the commencement of operations, an Operational Management Plan shall be submitted to the local government for approval, which includes the establishment of a complaints register to record any complaints that may be received and process for undertaking any mitigating actions that may be required.* *18. The measures included in the approved Operational Management Plan shall be implemented to the satisfaction of the local government.* *19. Prior to the commencement of works associated with the approved development or the issue of a Building Permit (whichever occurs first), the Noise Assessment shall be reviewed and submitted to, and approved by the Shire of Three Springs, in consultation with the Department of Water and Environmental Regulation."* It is also recommended that the following advice note be included with the determination: *"(d) The applicant is advised that this planning approval does not negate the requirement for any additional approvals, and adherence to due diligence, which may be required under separate legislation. This including, but not limited to, the obtaining of any required approvals from the Department of Health, the Department of Energy, Mines, Industry Regulation & Safety, the Department of Water & Environment Regulation and Main Roads WA and consulting of Before You Dig Australia. It is the applicant's responsibility to obtain*	

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			any additional approvals, and undertaking of due diligence, required before the development/use lawfully commences. *(n) In relation to condition 19 the reviewed Environmental Noise Assessment shall include:* *(i) Assessed noise levels for all nearby sensitive receivers.* *(ii) Background noise levels.* *(ii) Operating noise levels of equipment selected for installation.* *(iv) Assessment of noise levels for worst-case scenario of night-time at 100% capacity operation.* *(v) Recommended measures to reduce noise level exceedances.* *Any recommended measures to reduce noise level exceedances identified in the approved reviewed Noise Assessment shall be implemented to the satisfaction of the Shire of Three Springs, in consultation with the Department of Water and Environmental Regulation, prior to the operation of the approved development."*	

PART C – OTHER BUSINESS

1. State Administrative Tribunal Applications and Supreme Court Appeals

2. Meeting Closure