



12 June 2019

Brad James  
Senior Planning Officer  
Independent Planning Commission  
Level 3, 201 Elizabeth Street  
Sydney NSW 2000

### **Orange Grove Sun Farm – IPC Public Meeting Clarification**

Dear Brad

We would like to thank you and the Commission members who took the time travel to Gunnedah to visit the *Orange Grove Sun Farm* (OGSF) and provide the local community with an opportunity to gather further information about our project.

During both the site visit, and the community session, a few topics were raised that we would like to provide some further clarity to. On the following pages you can find further information on:

1. Flood Assessments
2. Fencing
3. Setbacks

We hope the Commission feels the trip was as equally beneficial and we are happy to discuss any aspect of the project with the Commission as required

We look forward to continuing the dialog with the Commission; please let us know if there are any questions or further clarity is required about any aspect of the project.

Best regards

A handwritten signature in black ink, appearing to read "Jason Gibson", with a long horizontal line extending to the right.

Jason Gibson  
Senior Development Manager  
OVERLAND Sun Farming Pty Ltd



## Flood Assessments

During the community session, aspects of the flood events within the area local to the OGSF project and the broader Carroll to Gunnedah region were discussed. OGSF recognises the sensitivity of the local community to the management of flood flows in the general Gunnedah and Orange Grove areas and specifically addressed this matter in completing detailed flood assessment studies and designing a project that avoids contributing to local impacts from large design flood events.

As part of the OGSF SEARs response from the *NSW Department of Planning and Environment* (DPE), a requirement for OGSF to perform an assessment of potential impacts to flood levels within the local Namoi River catchment was required. OGSF engaged *Hydro Engineering & Consulting Pty Ltd* (HEC), an engineering firm that specialises in hydrology and water supply and water management, to prepare a Surface Water Assessment, May 2018<sup>1</sup> in accordance to the SEARs requirements. HEC was selected to support the OGSF project in part because it has completed prior flood assessment studies in the area and has a strong understanding of flood hydrology conditions as they have been modified over recent decades.

HEC assessed the OGSF development area by considering historical events such as the 1955 and 1984 flood events, modifications to the catchment behaviour that occurred after 1955 including the influence of dam construction within the catchment, and the information and requirements of the then *Draft Floodplain Management Plan for the Upper Namoi Valley Floodplain 2016* (FMP) subsequently released 6 June 2019 as the Minister's Plan being the *Floodplain Management Plan for the Upper Namoi Valley Floodplain 2019*, issued pursuant to section 50 of the Water Management Act 2000. Note that the finalised FMP of June 2019 confirms the 1984 flood as the large flood design event for the assessment of infrastructure, land planning and development within the Namoi Valley floodplain.

Of note, is that the FMP identifies the 1984 flood event as the relevant large design flood event for the assessment of infrastructure developments and land use planning in the Namoi Valley floodplain. The HEC assessment of the OGSF development site therefore considered the 1984 event for the assessment of design flood conditions at the project site.

Below are excerpts from the FMP that outline the reasoning the 1984 event has been considered to be the large design flood model to use:

### **Draft Flood Management Plan for the Upper Namoi Floodplain**

#### *Part 3 – Flooding regimes*

##### Table 1 – Natural flooding regime

*Frequency: Since official records began, there was only one major flood recorded before Keepit Dam was built in 1960. This flood occurred in 1955, and had a 800,000 ML/day recorded at Gunnedah.*

##### Section 15 -- Existing Flooding Regime

- (1) *The existing flooding regime in the Upper Namoi Valley Floodplain is generally characterised by changes since the construction of Keepit Dam in 1960 on the Namoi River, the construction of Chaffey Dam in 1976 on the Peel River, and the construction of Split Rock Dam in 1984 on the Manilla River.*

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<sup>1</sup> Hydro Engineering & Consulting Pty Ltd, Orange Grove Sun Farm, Surface Water Assessment, May 2019 included as Appendix F in the Orange Grove Sun Farm Environmental Impact Statement, May 2018.



*This has coincided with river regulation (mainly the construction of weirs and regulators that allow water to be managed for irrigation delivery), land use and flood work development. These changes have affected the nature, frequency, extent and duration of flooding in the Upper Namoi Valley Floodplain.*

- (2) *Changes to the nature of flooding include:*
- (a) *alteration of the direction and depth of flood flows in some areas, and*
  - (b) *alteration of river, creeks and overland flow path flood volume carrying capacity in some areas, and*
  - (c) *increase in the velocity of flood flow rates, with flows getting to the lower reaches of the floodplain faster since the construction of development for irrigation purposes, and*
  - (d) *erosion of drains, and concentration of flows in scour paths.*
- (3) *Some parts of the valley have experienced a decrease in flooding due to the construction of Keepit Dam, while others have been subject to a potential increase in frequency due to channelisation and landuse (for example Bundella Creek).*
- (4) *Changes to duration of flooding include a reduction or increase in flooding duration in some flood events due to the changes to the nature of flooding.*

HEC's Surface Water Assessment concluded that the level of the 1984 flood is below the lowest development area of the OGSF and therefore the proposed project should not impact on the large design flood as described and recommended in the FMP.

HEC outlined the following points of particular note:

- *Available regional 10 metre (m) contours provided only a coarse interpretation of site topography and the geometry of the Namoi River channel. Therefore a level survey of the development area (to a 0.1 m contour interval) and a cross-section of the river and adjacent areas (covering approximately 6,750 m in length) were commissioned by OVERLAND.*
- *Much of the described flooding characteristics of the development area are drawn from flood modelling and assessment for the Namoi and Mooki Rivers undertaken by SMEC (2003) with the model boundary capturing the development area and adjacent land.*
- *The plotted 1955 flood profile (Figure 7.3a of SMEC, 2003) appears to indicate a modelled flood level of approximately 272.3 m Australian Height Datum (AHD) in the river adjacent to the site. This is lower than the lowest surveyed surface levels across the development area and therefore the proposed project should not impact on the relevant large design flood.*
- *Based on the modelling of the 1984 flood undertaken by SMEC (2003), the level of this flood is well below the lowest development area level and therefore the proposed project should not impact on the relevant large design flood (as defined in the Floodplain Management Plan for the Upper Namoi Valley Floodplain).*

HEC's assessment of surface water flows at the OGSF project site resulting from the FMP large design flood were submitted to DPE and advisory agencies as part of OGSF's *Environmental Impact Statement (EIS)*<sup>2</sup> for the proposed development. As part of the agency assessment process, the *NSW Department of Industry (DPI)* requested that a potential watercourse located in the north eastern corner of the proposed development site and mapped regionally as a 1<sup>st</sup> order watercourse, be assessed for activation as a breakout

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<sup>2</sup> Orange Grove Sun Farm, Environmental Impact Statement, May 2018.



channel under the FMP large design flood. It is noted that this channel area was inspected by the Commission members and attending parties during the project site visit on 3 June 2019 and identified as a general depression in the landscape.

Subsequently, OGSF engaged *GHD Pty Ltd* (GHD) to perform a flood assessment of the 1<sup>st</sup> order watercourse. Such work was completed using two-dimensional computational modelling of the FMP large design flood and identified the possibility that the watercourse could become activated in the FMP large design flood event. OGSF responded to these findings by modifying the layout of the development footprint for the project to remove all infrastructure from within the mapped 1<sup>st</sup> order watercourse. Hence the currently proposed configuration of the development footprint places project boundary fencing and solar generation infrastructure to the west and south-west of the designated channel.

This updated development footprint layout was presented alongside the GHD flood assessment of the 1<sup>st</sup> order watercourse<sup>3</sup>, as part of the OGSF *Response to Submissions* (RTS).

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<sup>3</sup> Orange Grove Sun Farm – Flood Assessment, Assessment of 1<sup>st</sup> Order Watercourse, GHD Pty Ltd, 10 October 2018



## Fencing

During the site inspection with the Commission and the community session the following day, discussions around the potential height, type and location of fencing occurred. OGSF provides the following clarification of the configuration and locations of site fencing to assist the Commission in its assessment of the project planning application.

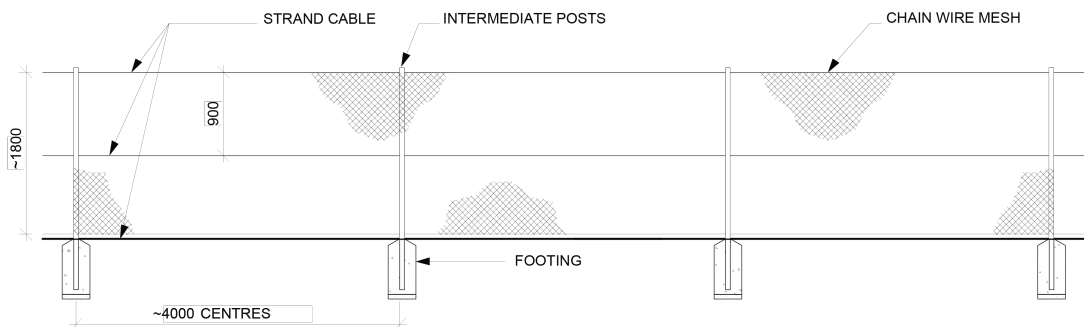
Currently, the perimeter of the land encompassing the proposed OGSF development footprint are fenced with “cattle fences” that are typical of the local area. Internally, the development area has been divided into various paddocks by further fences of the similar nature.

OGSF is not proposing to remove any of the existing fencing that bound the outermost perimeter of the lots that comprise the project area. Existing fencing that is located within bounds of the lots that makeup the OGSF, and hence within the development infrastructure area, will be removed to accommodate the solar farm infrastructure.

To secure the OGSF, fencing around the perimeter of the PV infrastructure areas and HV Substation will be installed. The perimeter fencing will be 1.8 metres in height and constructed of chainmesh and strand cables. Internal security fencing around high voltage electrical infrastructure at the substation will include additional protective strands above the 1.8m top of fence, given the protection required around such equipment.

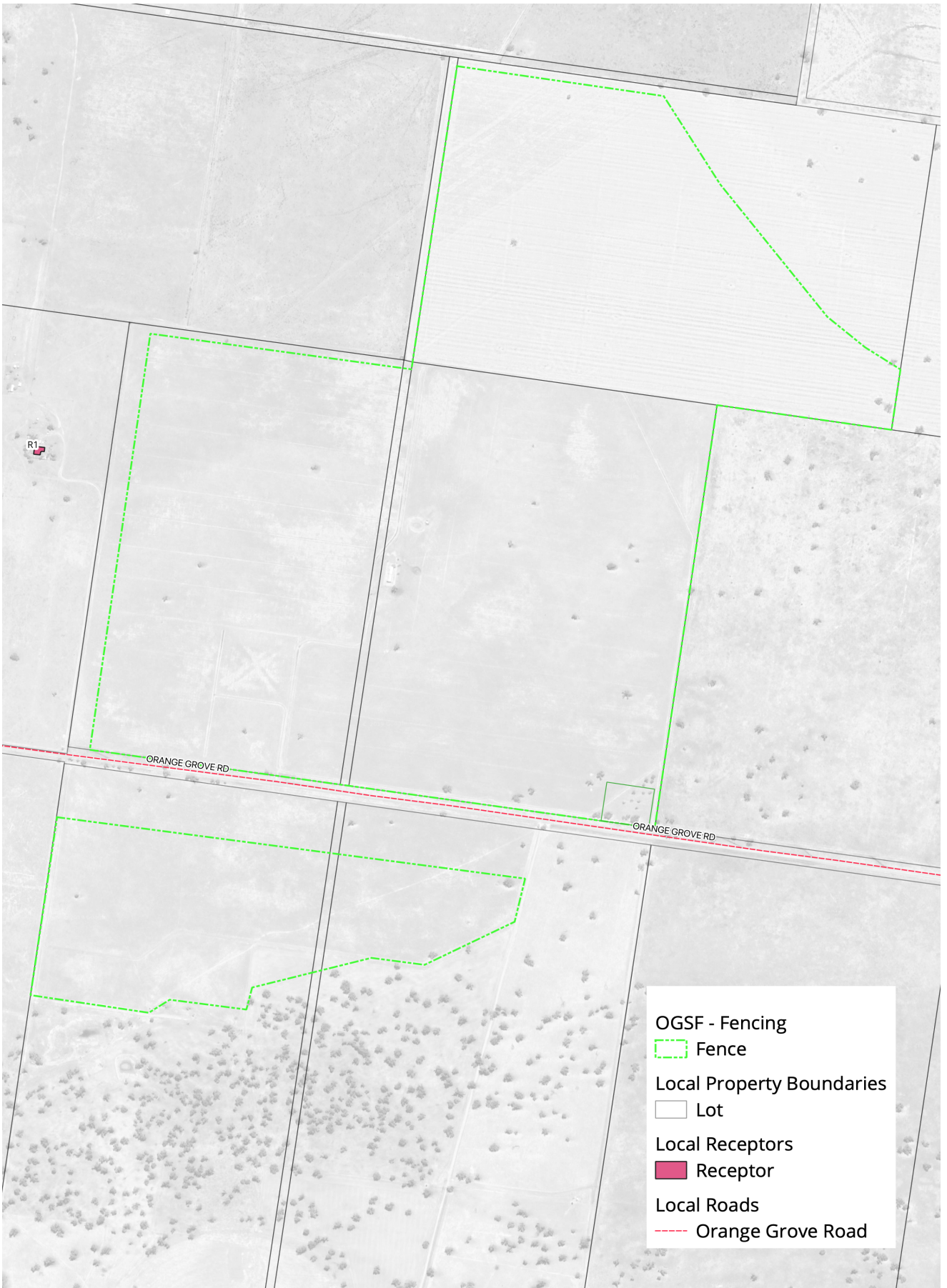
The type and configuration of the proposed external perimeter security fencing is consistent with industry standard. In addition, given the detailed flood assessment of the site that identified that the amended development footprint is above the level of the FMP large flood design event, OGSF does not consider that perimeter fencing will be subject to flood inundation or the loading of flood debris.

The perimeter fence is proposed to be constructed as shown below:



External security fencing will to be constructed to AS1725, AS2423 and/or other applicable Standards as required.

The following page contains a plan that identifies the locations of the proposed fencing, as described in the OGSF RTS submission.







## Setbacks to nearby receptors

During the site inspection with the Commission and the community session the following day, discussions took place with respect to the setbacks between adjacent receptors and infrastructure (including fencing and vegetation screening) within the Revised Development Footprint that was submitted as part of the OGSF RTS. To assist the Commissions assessment of the project planning application, OGSF provides the following clarification.

### General

With the revision of the OGSF development footprint under the RTS submission, setbacks to the following receptors have been amended to the following:

- R1: setback has increased by approximately 50m to an approximate total of 200m.
- R2: setback has increased by approximately 500m to an approximate total of 1.3km at the closest point to the infrastructure boundary.
- Namoi Pistol Club: setback has increased by approximately 550m to an approximate total of 1.8km.

### Receptor R1

OGSF proposes a 50m setback of the project perimeter security fence from the existing western boundary cattle fence that separates Lot 2/DP945590 of the project land from the land owned by receptor R1.

This setback will be configured as follows and as shown on the relevant cross section below:

- Vegetation buffer / landscape screening will be located between 7m and 10m to the east of the existing property fence. This is east of the existing irrigation drainage ditch on the project land.
- The vegetation screening will be planted prior to commencing construction with mature native vegetation stock.
- The target mature height of the vegetation will be 3m from ground level.
- DPE recommended Development Consent conditions, April 2019 provide additional consent conditions for the landscape screening.
- Infrastructure perimeter security fence will be constructed 50m from the existing property boundary with R1. The details of this proposed fence have been presented earlier in this document.

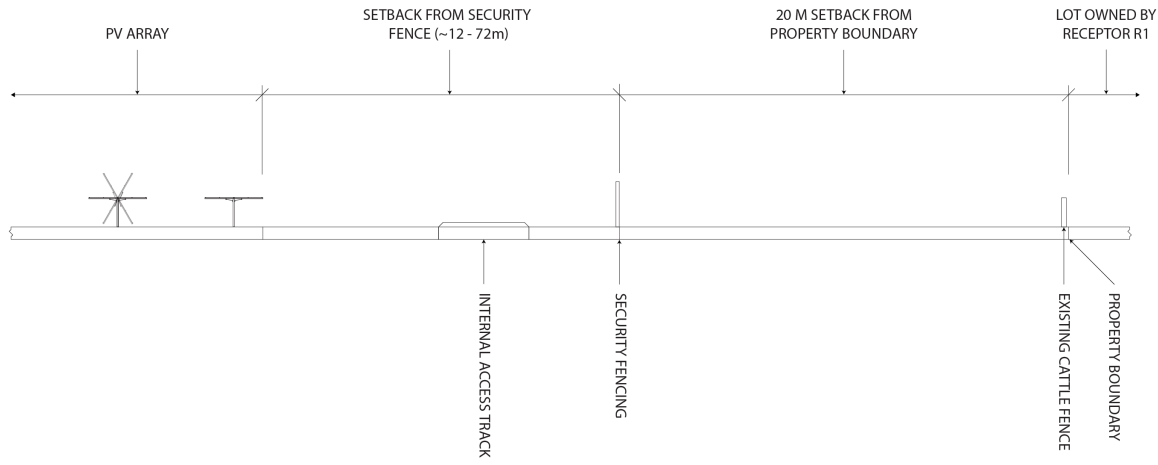
Solar PV modules and support tracking systems will be located a further 12 to 25m beyond the perimeter fence inside the infrastructure area.

OGSF proposes a 20m setback from land owned by Receptor R1 and the northern boundary of the project Lot 2/DP945590 and western boundary of the project Lot 1/DP1068520. The perimeter security fence will be located at 20m offset and solar PV modules and tracking equipment will be located a further offset distance as indicated in the project General Layout Plan G001 (refer Appendix A – Preliminary Site Layout, Glint and Glare risk Assessment, SMEC, November 2018).

The following two pages contain indicative cross sections of OGSF boundaries that are in common with Orange Grove Road, and Receptor R1.



### Cross Section: 20m setback to Receptor R1 Lots



### Cross Section: 50m setback to Receptor R1 Lot







Cross Section: Orange Grove Road

