WILLIAMSON
WATER & LAND ADVISORY

Assessment of Environmental Effects

Greytown Solar Farm

FAR NORTH SOLAR FARM LTD

WWLA0589 | Rev. 1

21 December 2022

WWLA

Project Name

Project no:	WWLA0589
Document title:	Resource Consent and Assessment of Environmental Effects
Revision:	1
Date:	21 December 2022
Client name:	Far North Solar Farm Ltd
Project manager:	Jon Williamson
Author(s):	Laila Alkamil
File name:	G:\Shared drives\Projects\Far North Solar Farms\WWLA0589_Greytown Solar Farm\Deliverables\WWLA_FINAL AEE_Greytown Solar Farm_ UPDATED.docx

Williamson Water & Land Advisory

P.O. Box 314
Kumeu
New Zealand
www.wwla.kiwi

Document history and status

Rev	Date	Description	By	Review	Approved
1	21 December 2022	Updated AEE for lodgement	Laila Alkamil	Jon Williamson	Jon Williamson

Distribution of copies

Rev	Date issued	Issued to	Comments
1	19 December 2022	Far North Solar Farm Ltd, South Wairarapa District Council	For lodgement

Contents

Appendices:

Appendix A – Application Form
Appendix B – Record of Title
Appendix C – Drawings and Site Layout Plan
Appendix D – Landscape and Visual Assessment
Appendix E – Iwi Consultation Correspondence

1 Introduction

1.1 Overview

This Assessment of Environmental Effects (AEE) report has been prepared on behalf of Far North Solar Farm Ltd (FNSF). The AEE supports an application to South Wairarapa District Council (SWDC) for resource consent to authorise the construction and operation of a 175 megawatt peak (MWp) solar farm at 415 Moroa Road, Greytown (the site). The proposed solar farm is for utility-scale renewable energy generation, which will be connected to the local substation for supply into the local and wider area electricity network.

This report has been prepared by Williamson Water & Land Advisory Ltd (WWLA) in fulfilment of section 88 of the Resource Management Act 1991 (RMA).

1.2 Applicant and Property Details

Table 1. Applicant and property details

Applicant	Far North Solar Farm Ltd
Site address	415 Moroa Road, Greytown
Record of Title	WN583/132 WNE1/330 WN22A/575 WN36B/542 WN43B/286 WN583/131 WN391/56
Legal description	Pt LOT 6 DP 8803 Pt LOT 7 DP 8803 Pt LOT 10 DP 3106 SECTION 27 MOROA SETT LOT 1 DP 52574 BLKS IV WAIRARAPA SD BLK PT SEC 122 MOROA DISTRICT LOT 1 DP 76478
Owner(s) of application site	Ian Kelvin Field Vivien Elizabeth Field Andrew James Field Michelle Jody Field James Frederick Cates Steven John Cates Vivienne Rona Malneek Field Enterprises Limited
Occupier of application site	Far North Solar Ltd
Site area	235 hectares (ha)
District Council **District Plan**	**South Wairarapa District Council** Wairarapa Combined District Plan
Regional Council **Regional Plan**	**Greater Wellington Regional Council** Proposed Natural Resources Plan (Appeals Version)

Applicant	Far North Solar Farm Ltd
Address for service during consent processing	**Williamson Water & Land Advisory** Attention: Laila Alkamil Email: Laila.Alkamil@wwla.kiwi Ph. 027 266 8405
Address for service during consent implementation and invoicing	**Far North Solar Farm Ltd** Attention: Richard Homewood Email: richard@fnsf.co.nz Ph: 020 4130 0403

We attach the application forms in **Appendix A** and copies of the relevant records of titles in **Appendix B**.

1.3 Overview of Resource Consent Requirements

Resource consent is sought from SWDC under the following rules of the Wairarapa Combined District Plan (WCDP):

- Rule 4.5.5 (c) – Any activity that is not required for primary production and residential purposes that requires either:
  (a) the construction of use of abuilding over 25 m^2 in gross floor area; or
  (b) the external storage of goods, products or vehicles (including contractors yards); and
  (c) is not otherwise listed as a **restricted discretionary** activity; and
- Rule 4.5.5 (e) (i) – Any activity that does not meet one or more of the standards for permitted or controlled activities as a **restricted discretionary** activity.

Overall, resource consent is sought as a **restricted discretionary** activity.

1.4 Consent Duration

As a land use consent is sought pursuant to section 9 of the RMA, an unlimited consent duration is sought.

2 Environmental Setting

2.1 Site Location and Description

The proposed solar farm will be constructed across one site, which is split between three parcels (refer to **Table 1**). The site is located approximately 5 km from Greytown and 50 m from Transpower's substation on the corner of Moroa Road and Bidwills Cutting Road.

The site is flat pastoral land, with the surrounding area dominated by other rural land uses (see **Figure 1** below). The site is within an area of standard rural character. Based on a review of SWDC's GIS Viewer, there are no HAIL[1] activities associated with the site. Transpower's Masterton – Upper Hutt A (MST-UHT A) 110kV transmission line and associated support structures traverse the southern boundary of the site.

Water races are present throughout the site, which provides drinking water to stock. No other waterbodies, or wetlands, are located on, or in proximity to the site.

The site is zoned Primary Production in the WCDP. No other planning overlays or notations apply.

[1] Hazardous Activities and Industries List.

Figure 1. Site location (approximate site boundary shown in red). (Source: SWDC, 2022).

2.2 Archaeology and Cultural Heritage

A review of the NZ Archaeological Association 'ArchSite' database has been undertaken and there are no known archaeological features registered on the site. Accidental Discovery Protocols will be followed in the unlikely event an archaeological site is discovered through the course of the works.

2.3 Landscape Values

2.3.1 General Setting

The landscape character of the site is described in the Landscape and Visual Assessment report (**Appendix D**).

The site is situated within the Central Plains character area, as described in the Wairarapa Character Study[2]. This study describes the landscape as being defined by flat to gently undulating, free-draining, old and recent gravel fans, terraces and floodplains, but with lower rainfall it is drier than the western and southern plains. Compared to the Western Plains, the Central Plains landscape has a feeling of openness and expansivity. To the east, the distinctive profile of Nga Waka -a-Kupe and Maungaraki Ranges are prominent landmarks and backdrops.

Land parcels on the plains tend to follow a regular, linear pattern, with drainage ditches and shelter belts creating a distinctive patchwork. The area is characterised by well-established rural and rural-residential

[2] Boffa Miskell Ltd – Wairarapa Landscape Study, 2010.

enclaves with some evidence of recent rural residential development. Smaller landholdings around the fringe of urban areas between 1-4 ha characterise the area. Transmission line pylons are also present and in some places a prominent element in the flat landscape.

Overall, the site is assessed in the Landscape and Visual Assessment as being of 'Ordinary' quality. It displays a distinguishable landscape structure, characteristic patterns of landform and land cover often masked by landuse, together with some features worthy of conservation, and some detracting features.

2.3.2 Visual Catchment

Given the flatness of the plains landscape, the visibility and visual catchment of the site is dictated predominantly by vegetation and separation distance. The main area of the site is accommodated within a triangle formed by State Highway 20 to the north and north-west, Moroa Road to the south and Bidwells Cutting Road to the east. The portion of the site to the south of Moroa Road is defined by that road on its northern side and flanked by Settlement Road to the south and Battersea Road to the east.

Moroa Road offers direct views into the northern and southern portions of the site for a distance of some 1,400 m to the west and some 350 m to the east. This gravel road experiences a low volume of traffic and provides access to a limited number of properties.

At its western end, approximately 2km from site, a cluster of rural residential properties occupy the triangle formed by State Highway 20 and Moroa Road, however these properties are located behind shelterbelts and other vegetation.

Landholdings along the balance of Moroa Road tend to be large, with few residential properties. Two properties are situated to the south of the road opposite the south-western corner of the site. A number of smaller rural residential properties are accessed from Settlement Road and Battersea Road and adjoin the southern boundary of the site. This portion of the site is partially separated from these properties by a fragmented shelterbelt which runs along the southern boundary of the site. Lots 1-4 DP 521225 and Lot DP 308376 have the potential to gain more direct views into the southern portion of the site. These properties are separated from the northern portion by Moroa Road and a distance of approximately 500 m.

A number of properties on Battersea Road offer the potential to gain westerly views into the southern portion of the site. These are identified as Lots 1-3 DP 306239 and a separated from the site by a distance of approximately 240 m.

The majority of residential properties along Bidwells Cutting Road are located approximately 650 m from the site and are buffered from the road by vegetation within private gardens.

Dwelling situated within two larger holdings (being Lot 2 DP 490058 and Pt Lot 10 DP 3106) offer the potential for westerly views to the site over a distance of some 600-700 m.

Views from State Highway 20 are very restricted by shelterbelts which delineate paddock boundaries between State Highway 20 and the site. Distant and glimpse views are possible from isolated positions, noting the site is approximately 1 km from State Highway 20. The majority of residential properties accessed from State Highway 20 tend to be screened from the site. The exception to this is a recently constructed dwelling within Lot 3 DP 510604, located a minimum of 315 m from the north-western boundary of the site.

2.4 Geology and Soils

The geology of the site is *Late Quaternary alluvium and colluvium*, consisting of unconsolidated mud, sand, gravel and peat[3].

[3] Information retrieved from: https://data.gns.cri.nz/geology/

The soils on the site are described as consisting of Tauherenikau stony silt loam, which is formed in ancient alluvial silt and gravel, and is quite strongly weathered[4]. This soil is characterised as being somewhat excessively drained and droughty and well-suited to viticulture. The site is currently used as pastoral farming only.

[4] http://www.nzsoils.org.nz/PageFiles/233/SoilsOfNZ%20By%20NZ%20Classification.pdf

3 Description of Proposed Works

3.1 General Layout Overview

The proposed solar farm will consist of approximately 175 MWp photovoltaic panels (see site layout plan and drawings in **Appendix C**). This will include the solar array and associated structures (medium voltage substations and 33 inverters).

In total for the site, arrays will be placed along with 33 inverter stations and approximately 321,160 solar panels. The panels will be on a single-axis fixed East-to-West mounting structure. At maximum 'tilt' (this being the maximum height of the structures) the panels will be 4.5 m above the ground and the ground clearance height will be approximately 300 mm above ground (see **Figure 2**). When tilted down, the height will be approximately 1.55 m above ground. The total height for the foundation piles will be 600 mm (refer to **Figure 3**).

The panels will be mounted on tracking tables, with the panels mounted in portrait format and 32 panels placed per table. The spacing (pitch) between the rows of tables will be 6 m.

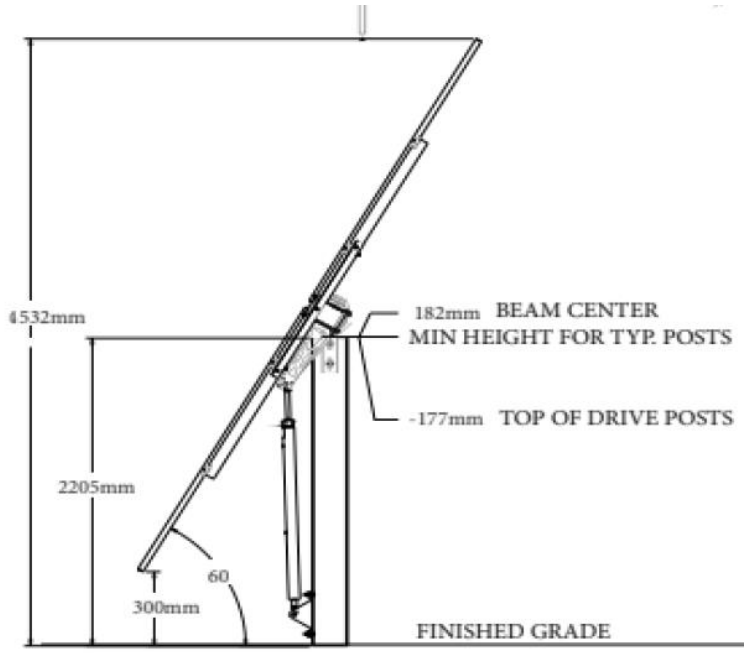

Figure 2. North-south elevation of solar array at maximum tilt. (Source: FNSF, 2022).

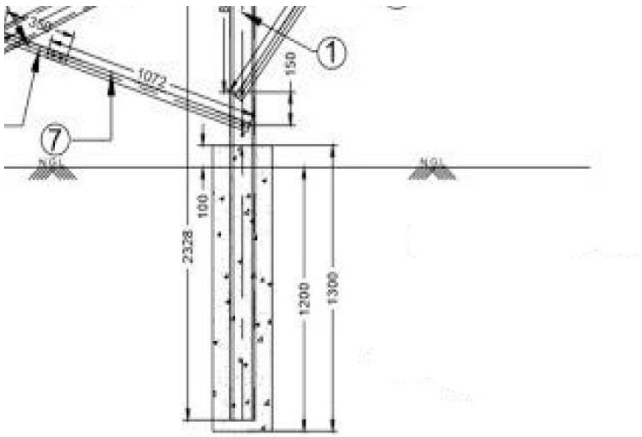

Figure 3. Foundation pile. (Source: FNSF, 2022).

3.2 Site Preparation

Since the site is flat and the mounting structures are piled, only minimal earthworks are required (no more than 500 m^3) for the following:

- Upgrading and re-gravelling of internal accessways.
- Creating a temporary compound for loading, unloading and turning.
- Foundation blocks for the substations.
- Perimeter security fencing (timber post deer fence to 2.1 m).

Trenches for cabling will be dug across the site to connect to Transpower's substation unit at the corner of Moroa Road and Bidwills Cutting Road. Work associated with trenching and connection to the National Grid does not form part of this application.

3.3 Infrastructure Establishment and Construction

The solar panels will be mounted on a driven pile east/west tracking system.

The solar arrays will arrive on the site partly pre-configured in container-based units. As such, approximately 60 shipping containers of hardware is expected to be brought on to the site. 33 inverters will be placed across the site, which will be used to collect the electricity generated and covert it to grid power. The electronics make minimal noise and have only small, internal cooling fans. The inverters will be placed as centrally as possible within the site to minimise any potential disruption to neighbours.

The existing site accesses from Bidwills Cutting Road and Moroa Road will be used to access the site. No new site accesses or parking areas are proposed.

Construction activities will take place over a 6–9 month period, with construction and primary electrical works being carried out in the first few months of construction. Deliveries will be on a strict schedule during the regular working week with an average of 3 truck deliveries per day during the construction period. All trucks will be parked within the site when making deliveries.

3.4 Stormwater

Whilst the panels themselves are impermeable, they are mounted individually with a minimum 6.4 m gap in-between each solar table. The ground underneath will remain vegetated and permeable being free-draining alluvial soil. Rain (stormwater) will runoff from the panels and fall to the ground, where it will infiltrate into the soil as normal.

As noted above, only minor earthworks associated with the upgrade of existing site tracks are proposed for the development. No grading or contouring of the site is proposed.

3.5 Works in Proximity to High Voltage Transmission Lines

There are two high voltage transmission lines which traverse the site (refer to **Section 2.1**).

The *New Zealand Code of Practice for Electrical Safe Distances* (NZECP:34) specifies minimum approach distances to all overhead power lines for construction activities and the placement of the solar panels. The design of the solar farm has sought to avoid transmission lines wherever possible and as such all panels and associated structures will be located a minimum of 20 m from the centreline of the transmission lines. No works or structures are proposed within the National Grid Yard (12 m setback either side of the centreline of the transmission line).

In addition to this, minimum safe electrical separation distance requirements, including for persons working near overhead lines and the operation of mobile plant, will be maintained at all times in accordance with NZECP:34 regulations.

To achieve this, the following measures will be implemented:

- Access to the support structures will be maintained at all times during construction and operation of the solar farm;
- For any earthworks required to be undertaken in proximity to transmission lines, dust suppression methods will be implemented in order to avoid arcing of lines;
- No machinery will operate in proximity to the lines;
- Blocking maintenance access to support structures;
- Dust from construction causing arcing of lines; and
- Machinery working in proximity to lines increasing the risk of electrical hazard if lines are struck.

3.6 Vehicular Access and Crossings

As shown in the site layout plan (**Appendix C**), three entrances to the solar farm will be provided on Moroa Road.

In addition to this, eight crossings over the water races within the sites will be required for internal access. The crossings will consist of a RCC pipe that is 400 mm by 5 m on the main races with compacted earthfill from the site to cover the top (refer to **Figure 4** below). The proposed pipe sizing is the same as existing pipe sizes to ensure there is no obstruction of water flow.

Access to the water races for maintenance will be provided for at all times. There will be no obstruction of water flow as a result of the accessway. A 5 m setback from all water races will be maintained.

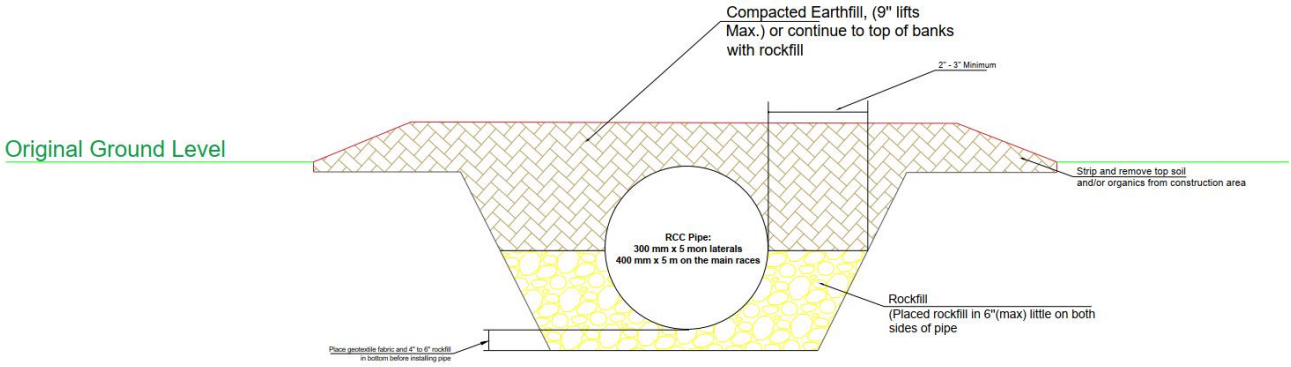

Figure 4. Cross section of proposed crossing. (Source: FNSF, 2022).

3.7 Operational Activities

Once constructed, the solar farm requires some maintenance which will involve the creation of 2 full time equivalent roles locally. Monitoring of the system is carried out remotely, however general maintenance of the tracking tables, solar panels and inverter connections will require some intervention during the operational life of the plant. Annual cleaning of the panels (with water only) will also be carried out.

To maintain grass beneath the panels, sheep grazing or cropping will take place. The panels themselves are warranted for 30 years with an expected lifespan in excess of the consent duration. At the end of the consented period, the solar farm is decommissioned and all materials are removed for recycling.

3.8 Consideration of Alternatives

Schedule 4 of the RMA requires the consideration of alternatives is given where it is likely that an activity will result in any significant adverse effects on the environment. As discussed in **Section 5** below, the proposed activity is not considered to result in any significant adverse effects on the receiving environment.

Notwithstanding this however, the applicant has assessed the viability of sites across New Zealand for solar farming. This particular site possesses the necessary aspect, solar hours, topography and proximity to electricity demand and infrastructure. On that basis, this site is considered the best practicable option for a solar farm.

4 Resource Consent Requirements

4.1 Overview

The requirements for resource consent are determined by the rules in the WCDP and the Proposed Natural Resources Plan (Appeals Version) (PNRP). The rules which apply are determined by the zoning of the site, any identified notations and the nature of the activities proposed.

The site is zoned Primary Production in the WCDP, and there are 110 kV high-voltage transmission lines which traverse the site. No other planning overlays or notations apply to the site.

4.2 Wairarapa Combined District Plan

Resource consents required under the WCDP is outlined in **Table 2** below. Overall, resource consent is required because part of the proposal is classified as a **restricted discretionary** activity.

Table 2. Resource consent required

Proposed activity	Rule reference / description	Activity status	Comment
Any activity that is not required for primary production and residential purposes	Rule 4.5.5 (c) - Any activity that is not required for primary production and residential purposes that requires either: (a) the construction or use of a building over 25 m^2 in gross floor area; or (b) the external storage of goods, products or vehicles (including contractors yards)	Restricted discretionary	The proposed solar farm is not an activity required for primary production and residential purposes and requires the construction of a building (solar panels) which exceed 25 m^2 in gross floor area.
Erection of solar panels within 25 m of an unsealed road	Rule 4.5.5 (e)(i) – Any activity that does not meet one or more of the standards for permitted or controlled activities	Restricted discretionary	The proposed solar panels will be located approximately 12 m from the road boundary, and therefore will not be able to comply with the relevant setback requirements for unsealed roads under Standard 4.5.2 (c) (ii). All other relevant zone standards under Standard 4.5.2 will be complied with.

4.2.1 Assessment Criteria – Restricted Discretionary Activities

Under Rules 4.5.5 (e) and 21.4.9, Council has restricted its discretion. These matters are identified in **Table 3** below. The assessment in **Section 5** of this AEE incorporates these matters, where relevant.

Table 3. Restricted discretionary matters of discretion

Rule reference	Matters of discretion
Rule 4.5.5 (c) – Any activity that is not required for primary production and residential purposes	i. Siting of any building; ii. Design and location of the access; iii. Location, size and effects of any signage; iv. Amenity and visual effects; v. Landscaping and screening; vi. Nose generated by the activity; vii. Changes in the type and amount of traffic;

Rule reference	Matters of discretion
	viii. Effects of retail activities in the Rural Zone on the viability and vitality of the existing town centres of Masterton, Carterton, Greytown, Martinborough and Featherson; ix. Servicing and infrastructure requirements.
Rule 4.5.5 (e)(i) – Any activity that does not meet one or more of the standards for permitted or controlled activities	i. Avoiding, remedying, or mitigating of any effects deriving from non-compliance with the particular(s) that is not met.

4.3 Permitted Activities

The activities listed in **Table 4** have been identified as permitted activities under the PNRP and WCDP. An assessment against the relevant standards is set out below.

Table 4. Permitted activities

Proposed activity	Rule reference / description	Comment on compliance
PNRP		
Earthworks and associated sediment discharge	Rule R99 – Earthworks The use of land and the associated discharge of sediment into water or onto or into land where it may enter water from earthworks up to a total area of 3,000 m^2 per property over a 12-month period.	• The proposed earthworks will not exceed an area of 3,000 m^2. • No soil will be place in a rea where it can enter a waterbody. • The earthworks will be of a very minor nature and will not result in any instability or subsidence of the land. • There will be no adverse effects as a result of the proposed activity.
Stormwater runoff	Rule R49: Stormwater to land The discharge of stormwater onto or into land, including where contaminants may enter groundwater.	• The proposed stormwater runoff is not from a HAIL site or industrial or trade site. • The volume of stormwater runoff will be very small and will not cause or exacerbate flooding of any other property. • The proposed stormwater runoff is not within 20 m of a bore used for potable supply or stock water.
River crossing structures	Rule R125: River crossing structures The placement or construction of a river crossing structure, including, but not limited to, weirs, fords and bridges, excluding culverts and a river crossing that dams a river, that is fixed in, on, under, or over the bed of a river, excluding activities regulation by the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017, including any associated: (a) Disturbance of the river or lake bed;	• The activity complies with general conditions specified in Section 5.4.4 of the PNRP. • The river crossing is in a catchment less than 50 ha in size. • The formed crossings are no wider than what is required for vehicular access and the total area of the structures do not exceed 20 m^2. • The activity does not occur within a site identified in Schedule C.

Proposed activity	Rule reference / description	Comment on compliance
PNRP		
	(b) Deposition on the river or lake bed; and (c) Diversion of water, and (d) Discharge of sediment to water, and (e) Temporary damming of water.	
WCDP		
Construction and operation of an electricity generating facility	Rule 21.1.24 (a) - The construction, maintenance and upgrading of network utilities and energy generating facilities which meets the following standards: i. Maximum height and setbacks – all above ground network utility and meteorological structures, except lines, poles, towers, masts, aerials, antennas and their brackets or attachments, must comply with the maximum height standards, maximum height to boundary standards for the Environmental Zone in which they are located.	• Maximum height and setback requirements refer to network utilities, not energy generating facilities. • No relevant standards apply to new energy generating facilities.
Construction of new accessways	Rule 21.1.25 (a) All new roads, intersections, access, parking and loading areas shall be provided in accordance with the standards in Appendix 5. (b) All sites and activities and shall have safe and practicable vehicle access from a public road. All vehicle crossings and intersections shall be positioned and constructed in accordance with standards in Appendix 5. (c) Every activity shall provide off-street parking and loading for vehicles associated with the activity and vehicles expected to visit or be stored on the site in connection with the	• All proposed accessways will be constructed in accordance with the standards set out in Appendix 5. • The required parking requirements set out in Table 21.1.25 for industrial activities will be complied with.

Proposed activity	Rule reference / description	Comment on compliance
PNRP		
	activity, in accordance with Table 21.1.25.1 below.	

4.4 Permitted Baseline

In terms of a permitted baseline, it is noted that the following activities within the Rule Zone are permitted under the WCDP:

- Structures (other than dwellings) up to 15 m in height;
- Intensive farming (not within 500 m of an existing dwelling); and
- Wastewater discharge from a municipal wastewater treatment system.

Standards that relate to these activities restrict the height of the structures, height in relation to boundary conditions and distance from other existing dwellings. Despite this, there is a fairly permissive baseline that provides for a wide range of rural activities, acknowledging that these activities have visual and landscape effects. Therefore, any potential landscape and visual effects associated with the proposed solar farm needs to be considered in the context of this permitted baseline and the activities that may be undertaken as of right (as per s95D(b), s95E(2)(a) and s104(2) of the RMA).

4.5 Other Consents and Approvals Required

The appropriate approvals from Transpower will be sought for the connection of the solar farm to the electricity transmission and distribution network in accordance with the Electricity Industry Participation Code 2010.

Approval will be sought from the Wellington Water and Land Team in relation to the crossings over the water races, in accordance with Rule 2.3.20 of the Moroa Water Race Bylaw 2007.

Upon completion of detailed design, the applicant will obtain the building consents (if required) for the proposed structures in accordance with the Building Act 2004.

5 Assessment of Effects on the Environment

5.1 Introduction

The following sections identify and assess the types of effects that may arise from the proposed works. This assessment also outlines the measures that the applicant proposes to avoid, remedy or mitigate any potential adverse effects on the environment.

SWDC has restricted its discretion to the matters identified in **Section 4.2.1**. These matters have been incorporated into the below sections.

Actual and potential effects on the environment have been identified as including:

- Positive effects;
- Effects on high voltage transmission lines;
- Landscape and visual effects;
- Construction effects;
  - Noise effects
  - Dust effects
  - Traffic effects
- Operational effects;
  - Noise effects
  - Glare effects
- Stormwater diversion and discharge effects; and
- Effects on prime soils.

5.2 Positive Effects

The proposed solar farm directly supports the reduction of New Zealand's greenhouse gas emissions. In doing so, the proposal provides security and resilience to the electricity generation network, by reducing pressure and reliance on the National Grid and regional distribution network. The provision of renewable energy is an important positive effect, as it contributes directly to New Zealand's goal of net zero emissions by 2050 as set out in the Climate Change Response (Zero Carbon) Amendment Act 2019.

More broadly, the proposed solar farm will provide renewable electricity to meet the demands of the South Wairarapa district. It therefore provides economic and social benefits by supporting the functioning of communities and businesses across the Wellington region.

5.3 Effects on High Voltage Transmission Lines

Construction and erection of structures within proximity to high voltage transmissions lines could give rise to the following potential effects if not appropriately managed:

- Blocking maintenance access to support structures;
- Dust from construction causing arcing of lines;
- Machinery working in proximity to lines increasing the risk of electrical hazard if lines are struck;
- Eathworks undermining support structures; and
- Earth Potential Rise (EPR).

As discussed in **Section 3.5**, the solar panels and all associated structures will be placed a minimum distance of 20 m from the centreline of the transmission lines. No works will occur within the National Grid Yard and

access to Transpower's support structures will be maintained at all times. On that basis, adverse effects on high voltage transmission lines are considered less than minor.

5.4 Landscape and Visual Effects

The Landscape and Visual Assessment (**Appendix D**) considers effects that can occur in relation to physical features, viewing audiences and visual amenity as well as effects on existing landscape character and amenity values. This is set out as follows:

- Natural character effects are considered as they relate to a change in the baseline condition of the level of natural character; and
- Landscape and visual amenity effects as they derive from changes in the physical landscape, which may give rise to changes in its character and how this is experienced. This in turn may affect the perceived value ascribed to the landscape.

5.4.1 Natural Character Effects

This proposal will result in the introduction of structures that are of an appearance and scale that will diverge from the existing pastoral and rural character of the site and its context. As discussed in **Section 2.3**, the site is assessed as being of 'Ordinary' landscape value. The site and its surroundings have been significantly modified in respect to its vegetation cover and therefore the proposed solar farm will result in limited changes to the natural character of the site.

In addition, as outlined in the Landscape and Visual Assessment (**Appendix D**), a 3 m wide screen planting strip (consisting of *cryptomeria japonica*) is proposed along the entire site boundary. This planting will replicate existing features which are present in the landscape, and so will maintain the existing patterning and character of the landscape. Taking this into consideration, natural character effects are assessed as being less than minor.

5.4.2 Visual Amenity Effects

The primary viewers of the site can be grouped, based on a commonality of views-type and geographical locations. Those with public viewpoints are as follows:

1. Users of Moroa Road; and
2. Visitors to the Wairarapa Clay Target Club on Moroa Road;
3. Users of Bidwills Cutting Road;
4. Users of Battersea Road;
5. Users of Settlement Road; and
6. Users of State Highway 2.

Those with private viewpoints are as follows:

1. Occupants of dwellings on Moroa Road;
2. Occupants of dwellings on Settlement, Battersea and Bidwells Cutting Road; and
3. Occupants of dwellings to the north (accessed from State Highway 2); and
4. Occupants of dwellings accessed from, or near, Pharazyns Road.

Table 2 in the Landscape and Visual Assessment provides a full breakdown of visual effects on all visual receptors (refer to **Appendix D**). This is also supported by the Visual Simulations (refer to Appendix 4 of the Landscape and Visual Assessment).

As discussed in the Landscape and Visual Assessment, the proposed solar farm will be contained by mitigation planting and as well as being located within a flat landscape, therefore meaning it is not visible to the majority of viewers. For the visual receptors that can see the proposed solar farm, advanced grade screening planting is proposed to screen the site.

Japanese Cedar trees will be planted early in the construction process, to ensure they are 2.5-3m high by the time the solar farm is commissioned for use. Trees will generally be topped to 3m. Where required, irrigation will be used during the first three years of growing. More mature trees will be planted in some critical areas as shown in the Mitigation Plan in the Landscape and Visual Assessment. These trees will be ordered early in the development stage to ensure they are 1.6 m high at time of planting.

On that basis of this, visual effects on neighbouring properties are assessed as being less than minor.

5.5 Construction Effects

5.5.1 Noise Effects

The proposed construction activity is limited to minor earthworks and the installation of the solar arrays which use a small rig for driving piles to the relevant depth (c. 1.6m), and battery powered hand tools. The proposed construction works will comply with the *New Zealand Standard NZS 6803:*1999 '*Acoustics – Construction Noise*'.

The noise produced from the construction activities is likely to be indiscernible from normal rural activities, such as harvesting or cultivating. Overall, the noise effects from construction activity are considered to be less than minor.

5.5.2 Dust Effects

The proposed works require minor earthworks only and therefore the potential for dust generation is low. Notwithstanding this however, appropriate dust control measures will be implemented to minimise potential effects. Dust mitigation measures are likely to include the following:

- Minimise the extent of exposed areas at any given time where possible;
- Maintain site accesses in good condition, including with gravel to minimise dust generation;
- Enforcement of maximum speed limits on the site to prevent dust generation; and
- Any vehicle loads moving fine material to be covered appropriately.

Overall, with these control measures in place, dust effects are considered to be less than minor.

5.5.3 Traffic Effects

Construction traffic will be focused towards the initial phase of the build period with up to 3 truck deliveries per day. Construction staff will park on site in the temporary compound area. All construction plant and equipment will be unloaded within the site and all turning and manoeuvring of vehicles is limited to the site. Once completed site maintenance is limited and will be carried out by staff arriving in small vans.

Overall, traffic effects are considered to be less than minor.

5.6 Operational Effects

5.6.1 Noise Effects

Operational noise effects are minimal and will not be noticeable from the boundary of the site. The substation units are the vented and will emit a low hum in operation. Average maximum sound pressure at 1m distance was measured at 62dBA.

Overall, operational noise effects are considered to be negligible.

5.6.2 Glare Effects

The solar panels are coated in low-reflectivity material to reduce the reflection of light and are set at low angles to reduce glare effects offsite. PV solar panels are designed to reflect as little sunlight as possible (generally around 2% of light received), resulting in negligible glare. Seen from above (such as from an aircraft), they appear dark-grey and do not cause a glare or reflectivity hazard. Compared to other everyday materials, solar panels reflect less light than building roofs, vehicles and water. As the solar panels are on a tracker system, they tend to reflect the sunlight upwards even at low angles. The reflection angle is the same as the incoming angle, so with the panels tilting to receive the sunlight without self shading, the reflected angle when the sun is low is even higher. This is demonstrated in **Figure 5** below.

Overall, glare effects are considered to be less than minor.

Figure 5. Explanation of glare effects. (Source: FNSF, 2022).

5.7 Stormwater Diversion and Discharge Effects

As discussed in **Section 3**, the solar arrays will be elevated above the ground, thereby enabling the existing groundcover below to remain. On that basis, there is no significant increase in impermeable surface cover across the site, and existing site drainage channels will remain.

On that basis, stormwater diversion and discharge effects are considered to be less than minor.

5.8 Effects on Prime Soils

As described in **Section 2.4**, the soils of the site consists of predominantly Tauherenikau stony silt loam, which is considered well-suited for viticulture but prone to becoming excessively drained.

The proposed solar farm will have no adverse effect on the productively potential of the soils on the site. There is adequate space in-between the solar panels (approximately 7-8 m) to enable the grazing of sheep or seasonal crop farming. Furthermore, the carbon status of the soil will be maintained, and the solar panels can be easily removed and the site reinstated to fully grazing upon completion of solar use. Overall, adverse effects on prime soils are considered less than minor.

5.9 Summary of Effects

The proposed solar farm will provide positive effects, notably the provision of renewable electricity generation. Increased security of electricity supply during dry periods of low hydro electricity production; assist in stabilising electricity prices with more renewable generation; achieving emission targets.

Construction of the proposed solar farm have the potential to give rise to a limited range of adverse effects, which overall are considered to be less than minor. Taking into account the positive effects, in particular the provision of renewable energy, the actual and potential effects of the proposal are able to be appropriately managed and mitigated.

6 Statutory Assessment

6.1 Section 104 of the RMA

Section 104 of the RMA sets out the matters to which a consent authority must have regard to, subject to Part 2 of the RMA, when considering an application for resource consent. These are:

- Any actual and potential effects on the environment of allowing the activity (refer **Section 5** above);
- Any relevant provision of:
  - a national environmental standard;
  - other regulations;
  - a national policy statement;
  - a New Zealand coastal policy statement;
  - a regional policy statement or proposed regional policy statement;'
  - a plan or proposed plan; and
- Any other matter the consent authority considers relevant and reasonably necessary to determine the application.

The following subsections address the relevant provisions identified above.

6.2 Part 2 of the RMA

Part 2 of the RMA sets out the purpose and principles of the Act. The purpose of the Act is to promote the sustainable management of natural and physical resources.

The Court of Appeal decision in *RJ Davidson Family Trust v Marlborough District Council* [2018] NZCA 316 clarifies that if a plan has been "competently prepared" under the RMA then it may be that in many cases the consent authority will feel assured in taking a view that there is no need to refer to Part 2 as it would not add anything to the evaluation exercise. The PNRP and Regional Policy Statement for the Wellington Region is considered to contain provisions prepared having regard to Part 2, and a coherent set of policies designed to achieve clear environmental outcomes. Based on the direction established by the Court of Appeal, it is considered that an assessment against Part 2 therefore adds little, if any value, to the overall evaluation.

Based on the assessment of the proposal against the objectives and policies set out in **Section 6.5**, the proposal is considered to be consistent with Part 2 of the RMA.

6.3 National Environmental Standards

6.3.1 Resource Management Act (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011

The National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) Regulations (2011) came into effect in 2012. The NESCS applies to assessing and managing the actual or potential adverse effects of contaminants in soil on human health from five activities, including soil disturbance. The NESCS only applies to land which is considered to have had an activity occur which is on the HAIL. As noted in **Section 2.1**, there are no HAIL activities identified to have occurred on the site. The NESCS does not apply to this proposal.

6.3.2 Resource Management (National Environmental Standards for Freshwater) Regulations 2020

The NES-Freshwater sets out requirements for carrying out certain activities that pose risks to freshwater and freshwater ecosystems. The proposed works involve constructing crossings over water races on the property, however this does not include installing any culverts, weirs or any other in-stream structures. Furthermore, there

are no natural wetlands within 100 m of the works area. On that basis, the NES-Freshwater is not considered to be relevant to this proposal.

6.3.3 National Environmental Standards for Electricity Transmission Activities 2009

The National Environment Standards for Electricity Transmission Activities 2009 (NES-ETA) sets out a national framework for activities on existing electricity transmission lines. It does not apply to the construction of new transmission lines or renewable electricity generation, i.e., the NES-ETA do not apply to the proposed works.

6.4 National Policy Statements

6.4.1 National Policy Statement Renewable Energy Generation 2011

The National Policy Statement for Renewable Electricity Generation 2011 (NPS-REG) recognises the importance of renewable energy in helping New Zealand achieve the Government's target of 90 percent of electricity from renewable sources by 2025. The NPS-REG promotes a more consistent approach to balancing the competing values associated with the development of New Zealand's renewable energy resources when councils make decisions on resource consent applications.

This proposal is directly supported by the single objective of the NPS-REG, which sets out to provide for the development, operation and maintenance and upgrading of new and existing renewable electricity generation activities. The proposed solar farm will provide a resilient and renewable source of electricity generation for the South Wairarapa district, which will reduce the dependency and pressure on the National Grid.

6.4.2 National Policy Statement for Highly Productive Land 2022

The National Policy Statement for Highly Productive Land 2022 (NPS-HPL) is newly released and provides direction on how to improve the way highly productive land is managed under the RMA.

The NPS-HPL objective is to protect highly productive land for use in land-based primary production, and it contains various policies to achieve this. It is noted that under the 'Implementation' section of the NPS-HPL, territorial authorities are directed under Section 3.9(1) to avoid the inappropriate use and development of highly productive land that is not land-based production. The exceptions to this are listed in Section 3.9(2), which includes when there is a functional or operational need for the use or development to be on highly productive land for the maintenance, operation, upgrade or expansion of specified infrastructure. The proposed solar farm is for renewable electricity generation into the National Grid, and therefore it is regionally significant infrastructure that meets the definition of 'specified infrastructure'. There are also functional and operational requirements for it to be located on the subject site.

An assessment against the relevant provisions of the NPS-HPL is provided in **Table 5** below. Overall, the application is considered consistent with the NPS-HPL.

Table 5. NPS-HPL objective and policy assessment

Objective/policy	Comment
Objective 2.1 – Highly productive land is protected for use in land-based primary production, both now and for future generations.	The proposed solar farm will not adversely impact the productive potential of the soils on the site, which will be protected for both current and future generations.
Policy 2.2 (1) – Highly productive land is recognised as a resource with finite characteristics and long-term values for land-based primary production.	As discussed in **Section 2.4**, the carbon status of the soil will be maintained and the solar panels can be easily removed and the site reinstated to fully grazing upon completion of solar use. Overall, adverse effects on prime soils are considered less than minor.

Objective/policy	Comment
Policy 2.2 (8) – Highly productive land is protected from inappropriate use and development.	The proposed solar farm will enable the productive potential of the site to remain. The site will either be cropped or grazed by sheep to ensure grass is managed, while also enabling electricity generation to be undertaken. The proposal is an appropriate use of the site.

6.5 Regional Policy Statement for the Wellington Region

An assessment against the relevant provisions of the Regional Policy Statement for the Wellington Region (RPS-WR) is provided in **Table 6** below. Overall, the application is considered consistent with the RPS-WR.

Table 6. RPC-WR objectives and policy assessment

Objective/policy	Comment
Chapter 12 – Energy	
Objective (2) – An increasing proportion of energy is provided by sources that are renewable.	The proposed solar farm directly contributes to the provision of renewable energy in the district and helps support social and economic well-being in a sustainable manner.
Policy (4) – To promote efficient and effective use and management of all energy resources in the short-term, and the adoption and use of appropriate renewable energy resources for industry, commerce and domestic energy services in the longer-term.	
Objective (3) – Adverse local and global environmental effects of energy production, transportation, transmission, conversion and end uses are avoided, remedied or mitigated.	As discussed in **Section 5**, the proposal will have a less than minor adverse effect on the environment. Appropriate mitigation measures will be in place to ensure adverse effects are managed. There will be no adverse effects on human health as a result of the proposal.
Policy (6) – To promote efficient energy production from the Region's renewable energy assets, where the effects of the development are environmentally acceptable.	
Policy (9) – To avoid, remedy or mitigate any adverse effects on human health that arise from the production, transmission, transportation, conversion and end use of energy.	

6.6 Wairarapa Combined District Plan Assessment

The WCDP is a combined district plan, encompassing the Masterton, Carterton and South Wairarapa district. A full assessment of the proposed works against the relevant objectives and policies in the WCDP is provided in **Table 7** below.

Table 7. WCDP objectives and policy assessment

Objective/policy	Comment
Chapter 4 – Rural Zone	
Objective 4.3.1 – To maintain and enhance the amenity values of the Rural Zone, including natural character, as appropriate to the predominant land use and consequential environmental quality of different rural character areas within the Wairarapa.	As discussed in **Section 5**, the proposed solar panels are consistent with other rural activities – such as glasshouses. The amenity values of the rural zone, including natural character, will be maintained.
Policy 4.3.2 (d) – Maintain and enhance the amenity values, including natural character, of the differing Rural character areas through appropriate controls over subdivision and the bulk, location and nature of activities and buildings, to ensure activities and buildings are consistent with the rural character,	The proposed solar farm will have a less than minor adverse effect on landscape and visual amenity effects. Overall, amenity values including natural character will be maintained.

Objective/policy	Comment
including an appropriate scale, density and level of environmental effects.	
Policy 4.3.2 (e) – Manage subdivision, use and development in a manner which recognises the attributes that contribute to rural character, including: i. Openness and predominance of vegetation; ii. Productive working landscape; iii. Varying forms, scale and separation of structures associated with primary production activities; iv. Ancillary living environment, with an overall low population density; and v. Self-serviced allotments.	The proposed solar farm is appropriately managed to ensure the rural character of the site is recognised and maintained. The proposal involves extensive screening which will serve to protect amenity values and 'break up' the pattern of solar panels on the site.
Objective 4.3.4 – To enable primary production and other land uses to function efficiently and effectively in the Rural Zone, while the adverse effects are avoided, remedied, or mitigated to the extent reasonably practicable.	The proposed solar farm is an efficient use of land in the rural zone, which will provide renewable energy for the South Wairarapa district. As discussed in **Section 5**, adverse effects are expected to be less than minor and will be appropriately managed.
Policy 4.3.5 (d) – Ensure activities that are potentially sensitive to the adverse external effects of primary production and any other lawfully established activities, particularly those activities with significant external effects, are either appropriate sited, managed or restricted to avoided or mitigate these effects.	The proposed solar panels will be appropriately sited within the site, with a 10 m setback from the site boundaries. Furthermore, the proposed solar farm is an appropriate activity within the rural zone and consistent with primary production activities.
Policy 4.3.5 (c) – Manage the establishment and operation of a range of other activities in the Rural Zone, such that their adverse effects on the environment are appropriately avoided, remedied or mitigated.	As discussed in **Section 5**, adverse effects associated with the proposed works will be adequately avoided and mitigated. Overall, adverse effects are considered to be less than minor.
Chapter 8 – Tangata Whenua	
Objective 8.3.1 – To recognise and provide for the cultural values and relationship of Tangata Whenua in managing the natural and physical recourses and the effects of activities, while taking into account the principles of the Treaty of Waitangi.	A copy of the draft application documents will be provided to iwi for comment.
Policy 8.3.2 (a) – Recognise Tangata Whenua values and provide for Tangata Whenua to maintain and enhance their additional relationship with the natural environment.	
Chapter 9 – Landscape	
Policy 9.3.2 (g) – Ensure subdivision and development is managed by having regard to the adverse effects on the landscape values of the site and locality.	Adverse effects on landscape values from this proposal is assessed in **Section 5.4**. Overall, the proposed solar farm will be managed appropriately with measures such as screening planting utilised to reduce adverse effects on landscape values.
Chapter 16 – Network utilities and energy	
Objective 16.3.4 – To move the Wairarapa towards a sustainable energy future by encouraging energy efficiency and the generation of energy from renewable sources.	The proposed solar farm will provide a significant source of renewable energy for the Wairarapa district, which in turn will support the functioning of rural communities.
Policy 16.3.5 (b) – Recognise the local, regional and national benefits to be derived from renewable energy generation.	The proposed solar farm will provide numerous benefits at the local, regional, and national level. On a local level, the solar farm will provide renewable energy that will support the functioning of communities. On a broader level, the generation of solar energy will increase the resilience

Objective/policy	Comment
	of the National Grid by a providing a renewable energy which supports New Zealand's goal of being carbon neutral by 2050 as set out in the Climate Change Response (Zero Carbon) Amendment Act 2019.
Policy 16.3.5 (c) – Recognise and manage appropriate development of the Wairarapa's significant potential renewable energy resource.	The proposed solar farm is an appropriate development that will form an important part of the Wairarapa's renewable energy resource.
Policy 16.3.5 (d) – Provide for renewable energy generation while, as far as practicable, avoiding, remedying or mitigating the adverse effects, particularly of large scale and/or prominent facilities.	As discussed in **Section 5**, adverse effects on landscape values are mitigated as far as practicable by providing appropriate screen planting. Overall, adverse effects will be appropriately avoided, remedied or mitigated.
Policy 16.3.5 (e) – Recognise and promote the use of environmental management codes of practice and best practice methods in energy generation, distribution and use.	The solar farm will be constructed and operated in accordance with all relevant codes of practice, including the *New Zealand Code of Electrical Safe Distances*. The solar panels and associated equipment will be acquired from 'tier 1' supplies to ensure the highest quality of equipment is used.
Chapter 17 – Transportation	
Objective 17.3.1 – To maintain the safe and efficient operation and development of the road network from the adverse effects of land use while maintaining the network's ability to service the current and future needs of the Wairarapa.	Construction traffic will be focused towards the initial phase of the build period with up to 3 truck deliveries per day. Construction staff will park on site in the temporary compound area. All construction plant and equipment will be unloaded within the site and all turning and manoeuvring of vehicles is limited to the site. Overall, the safe and efficient operation of the road network will be maintained.
Policy 17.3.2 (b) – Establish controls and standards on land use and subdivision to avoid, remedy or mitigate any effects of the land use on the safe and efficient functioning and operation of the road network, including loading, parking and manoeuvring.	As discussed in **Section 5.5.3**, traffic effects will be less than minor on the safe and efficient functioning and operation of the road network. Only 3 trucks per day are required during the construction of the solar farm and all vehicle manoeuvring will be limited to the site only.
Chapter 19 – General Amenity Values	
Objective 19.3.1 – To maintain and enhance those general amenity values which make the Wairarapa a pleasant place in which to live and work or visit.	This proposal will maintain general amenity values. The site and its surroundings have been significantly modified in respect to its vegetation cover and therefore the proposed solar farm will result in limited changes to the natural character of the site. In addition, a 3 m wide screen planting strip is proposed along the entire site boundary. This planting will replicate existing features which are present in the landscape, and so will maintain the existing patterning and character of the landscape.
Policy 19.3.2 (g) – Manage activities with unacceptable visual effects on amenity values, in accordance with the qualities of each environmental zone. As a guide to determining if an activity has unacceptable visual effects, consideration will be given to other policies relevant to a particular activity or environmental zone.	The proposed solar farm is consistent with other activities in the rural zone, and therefore is not considered to have an unacceptable visual effect on amenity values.

6.7 Other matters

6.7.1 Climate Change Response (Zero Carbon) Amendment Act 2019

The Climate Change Response (Zero Carbon) Amendment Act 2019 provides a framework for the development and implementation of climate change policies to address climate change in New Zealand and contribute to the global effort under the Paris Agreement to limit the global average temperature increase to 1.5 Celsius above

pre-industrial levels. The amendments set a new domestic greenhouse gas emissions reduction target for New Zealand, including reducing net emissions of all greenhouse gases (except biogenic methane) to zero by 2050.

The proposed solar farm will generate renewable electricity for the South Wairarapa district, which decreases reliance of the National Grid on fossil fuel sources of electricity, and directly supports the goal of net zero emissions from greenhouse gases by 2050.

6.8 Notification Assessment

6.8.1 Public Notification

Section 95A of the RMA is relevant when a consent authority is considering whether a consent application should be considered with or without public notification.

Section 95A identifies a four-step process. In relation to these steps, the following is noted:

- The applicant does not request public notification of the application.
- There is no rule or national environmental standard that precludes or requires public notification of this application.
- An assessment of effects on the environment is provided in **Section 5** of this report. This assessment concludes that adverse effects on the environment are likely to be less than minor.
- The application is not for any of the activities identified in section 95A(5)(9b) (i.e. a controlled activity, subdivision of land or residential activities, a boundary activity, or an activity prescribed in section 360H(1)(a)(i)).

Based on this assessment, we consider that this proposal meets the tests of the RMA to be processed without public notification.

6.8.2 Limited Notification

For applications that are not publicly notified, under section 95B, the consent authority must determine whether to give limited notification of an application to any affected parties. Section 95B identifies a four-step process. In relation to these steps, the following is noted:

- The application does not need to be notified to any parties under section 95B(4). The proposal will not affect any customary rights.
- The proposed activity will not affect land that is subject of a statutory acknowledgement.
- There are no applicable rules or national environmental standards precluding limited notification.
- No special circumstances are considered to exist in relation to the application that warrant notification of the application to any other persons not already determined to be eligible for limited notification.

Section 95E(1) states that a consent authority must consider a person to be an affected person if the activity's adverse effects on the person are minor or more than minor (but not less than minor). As discussed in **Section 5**, adverse effects are assessed as being less than minor. On that basis, we do not consider there to be any affected parties and therefore do not seek limited notification.

6.9 Section 95 Conclusions

Based on the steps set out in sections 95A and 95B, we consider that this application should be processed on a non-notified basis.

7 Consultation

7.1 Overview

The applicant has had discussions with SWDC regarding the application, which include:

- A phone call with the duty planner on 7 April 2022 to discuss potential consenting requirements;
- An email on 26 May with the Planning Manager to discuss iwi consultation requirements; and
- A Pre-Application meeting with the Planning Manager on 15 June to confirm consenting requirements.

7.2 Mana Whenua

Application documents will be provided to SWDC's Māori Standing Committee, which comprises of two representatives from tangata whenua in the district. In addition, application documents will be sent directly to the following iwi for comment prior to lodgement (refer to **Appendix E**):

- Ngāti Kahungunu ki Wairarapa; and
- Rangitāne o Wairarapa.

No comments have been received on the application to date from iwi. The applicants will keep SWDC during the consenting process if any comments are received.

7.3 Fire and Emergency New Zealand

The Applicant has sought feedback from Fire and Emergency New Zealand (FENZ) regarding the proposal. Discussions with FENZ have covered the following aspects:

- Ensuring sufficient access for fire appliances on the site is provided;
- Provisions for firefighting water supplies to be available on site; and
- Site familiarisation visits and risk management plans to be developed.

8 Conclusion

This AEE report has been prepared on behalf of FNSF to accompany a resource consent application to SWDC to authorise the construction and operation of a 175 MWp solar farm at 415 Moroa Road, Greytown. The proposal requires resource consent from SWDC under Rules 4.5.5 (c) and 4.5.5 (e)(i) of the WCDP as a **restricted discretionary** activity.

The AEE report draws the following conclusions:

- The proposal is consistent with Part 2 of the Resource Management Act 1991;
- The proposal is consistent with the objectives and policies of the WCDP and NPS-REG; and
- The proposal will provide numerous positive effects in relation to the provision of renewable electricity generation for the Wairarapa district.

The proposal will be undertaken in accordance with robust mitigation measures to ensure adverse effects on the receiving environment is appropriately managed and mitigated. We would appreciate the opportunity to review draft conditions.