

#### 9 December 2024

Dear

#### LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT Request: 2024-50

Thank you for your email of 17 October 2024 to the Carterton District Council attached as **Appendix A.** 

Your request has been considered under the Local Government Official Information and Meeting Act 1987 (the Act).

#### Resource Consent 240014 (107 Cornwall Road)

The information that you are requesting for the Applicant's Assessment of Environmental Effects, Visual Assessment, Visual Mitigation, Planting Assessment assessing the proposed Solar Farm, and Final decision including conditions for 240014 (107 Cornwall Road).

I have identified seven documents that are within in scope that relates to the correspondence between Council and the applicant, and any correspondence from rate payers in relation to the Resource Consent 240014 (107 Cornwall Road). This is attached as **Appendix B**.

You may also wish to view the Policy and Projects Committee meeting Agenda dated 16 October 2024 which can be viewed here: <u>Agenda of Policy and Projects Committee meeting</u> <u>- Wednesday, 16 October 2024</u>, refer to Item 6.4 page 41.

#### Resource Consent 230034 (331 Norfolk Road)

The information you are requesting for the Applicant's Assessment of Environmental Effects, Visual Assessment, Visual Mitigation, Planting Assessment assessing the proposed Solar Farm, and Final decision including conditions for 230034 (331 Norfolk Road).

I have identified three documents that are within in scope that relates to the correspondence between Council and the applicant, and any correspondence from rate payers in relation to Resource Consent 230034 (331 Norfolk Road). This is attached as **Appendix C.** 

You may wish to view a request that was made in October 2023 which relates to the Resource Consent Application for 331 Norfolk Road in our website here: <u>2023-65-66-</u><u>Response.pdf</u>.

28 Holloway Street, Carterton, Wairarapa | PO Box 9, Carterton, 5743 info@cdc.govt.nz | 06 379 4030 | www.cdc.govt.nz Details of all the correspondence documents relating to **Appendix B and C** are tabled below. I am releasing these documents in part, and some of the information are withheld under the following sections:

- s7(2)(a) of the Act, to protect the privacy of natural persons.
- s7(2)(i) of the Act, to enable any local authority holding the information to carry on, without prejudice.

Resource Consent 240014 (107 Cornwall Road) – Appendix B				
Document number	Date	Title	Decision	
1	Email dated 7	Meeting notes from Thursday 2 <sup>nd</sup> Feb	Released in part.	
	February 2023		Information has	
			been withheld	
			under section	
			7(2)(a) of the Act.	
2	Email dated 21	Re: 51, 99 and 107 Cornwall Road	Released in part.	
	February 2024	proposed solar farm, Rural Zone,	Information has	
		Activity Status check	been withheld	
			under section	
			7(2)(a) of the Act.	
3	16 April 2024	Stradegy Urban, Environmental &	Released in part.	
		Strategic Planning Resource Consent	Information has	
		Application for Land Use	been withheld	
			under section	
			7(2)(a) of the Act.	
4	Email dated 23	solar farm application – lodged for	Released in part.	
	April 2024	s7(2)(a) and 107 Cornwall Road	Information has	
			been withheld	
			under section	
			7(2)(a) of the Act.	
5	Email dated 16	Re: Report Decision – Cornwall Road –	Released in part.	
	July 2024	Solar Farm	Information has	
			been withheld	
			under section	
			7(2)(a) of the Act.	
			Information has	
			been withheld	
			under section	
			7(2)(i) of the Act	
6	Email dated 30	Report Decision-Cornwall Road-Solar	Released in part	
-	July 2024	Farm	Information has	

#### 28 Holloway Street, Carterton, Wairarapa | PO Box 9, Carterton, 5743 info@cdc.govt.nz | 06 379 4030 | www.cdc.govt.nz

Resource Consent 240014 (107 Cornwall Road) – Appendix B				
Document number	Date	Title	Decision	
		Attachments: draft condisions_application_comments.docx	been withheld under section 7(2)(a) of the Act. Information has been withheld under section 7(2)(i) of the Act.	
7	Email dated 1 August 2024	240014 Report Decision – Cornwall Road-Solar Farm.pdf	<b>Released in part.</b> Information has been withheld under section 7(2)(a) of the Act.	

Resource consent 230034 (331 Norfolk Road) – Appendix C					
Document number	Date	Title	Decision		
1	Email dated 5 June	Small Solar Farm Norfolk	Released in part.		
	2024	Road – Attachments:	Information has been		
		Solar Farm Permitted	withheld under		
		Activity_compressed.pdf;	section 7(2)(a) of the		
		220103-Application	Act.		
		final-10012023.pdf;			
		220103-s95-Decision-			
		FINAL.pdf			

In response to the Resource Consent for the NZ Clean Energy - 100MW Masterton Solar and Energy Farm, please see the attached link which provides the documents as requested, these being:

- Applicant's Assessment of Environmental Effects
- Visual Assessment
- Visual Mitigation Planting Assessment assessing the proposed Solar Farm

Notified Resource Consents | Carterton District Council

In terms of your other two requests in relation to correspondence between the Council and the applicant and Council and the ratepayers. I am refusing this part of your request for the reason that Resource Consent is currently under consideration.

28 Holloway Street, Carterton, Wairarapa | PO Box 9, Carterton, 5743 info@cdc.govt.nz | 06 379 4030 | www.cdc.govt.nz Where information has been withheld under section 7(2), I have considered, as required under section 7(1) of the Act, the public interest considerations favouring its release. I have identified no public interest considerations which outweigh the need to withhold information at this time.

Please note, the Council proactively publishes LGOIMA responses on our website. As such, we may publish this response on our website after five working days. Your name and contact details will be removed.

Thank you again for your email. You have the right to ask an Ombudsman to review this decision. You can do this by writing to <u>info@ombudsman.parliament.nz</u> or Office of the Ombudsman, PO Box 10152, Wellington 6143.

Yours sincerely

Geoff Hamilton Chief Executive Carterton District Council

28 Holloway Street, Carterton, Wairarapa | PO Box 9, Carterton, 5743 info@cdc.govt.nz | 06 379 4030 | www.cdc.govt.nz

LGOIMA ID: 2024-50

#### Appendix A

#### Serah Pettigrew

From: Sent: To: Subject:	Thursday, 17 October 2024 9:55 am LGOIMA Requests RE: Resource Consent 240014 (107 Cornwall Road)
Follow Up Flag:	Follow up
Flag Status:	Completed

**Caution:** This email originated from outside the council. Do not click links or open attachments unless you recognize the sender and know the content is safe.

To Carterton District Council,

In relation to Resource Consent 240014 (107 Cornwall Road): Discretionary, establish, operate & maintain a solar farm & associated activity. Decision date 01/08/2024 can you please provide the Resource Consent Application including:

- Applicant's Assessment of Environmental Effects
- Visual Assessment
- Visual Mitigation Planting Assessment assessing the proposed Solar Farm
- Any related correspondence between Council and the Applicant
- Any correspondence from rate payers in relation to this Consent
- Final decision including conditions

In relation to Resource Consent 230034 (331 Norfolk Road): Discretionary activity, construct and operate a 4.5MW community scale solar farm. Decision date 26/07/2023 can you please provide the Resource Consent Application including:

- Applicant's Assessment of Environmental Effects
- Visual Assessment
- Visual Mitigation Planting Assessment assessing the proposed Solar Farm
- Any related correspondence between Council and the Applicant
- Any correspondence from rate payers in relation to this Consent
- Final decision including conditions

In relation to the Resource Consent for the NZ Clean Energy - 100MW Masterton Solar and Energy Farm can you please provide the Resource Consent Application including:

- Applicant's Assessment of Environmental Effects
- Visual Assessment
- Visual Mitigation Planting Assessment assessing the proposed Solar Farm
- Any related correspondence between Council and the Applicant
- Any correspondence from rate payers in relation to this Consent

Thank you and regards,



#### **Document 1**

#### **Serah Pettigrew**

From:
Sent:
To:
Subject:

Claire Price **S** 7(2)(a) Tuesday, 7 February 2023 3:38 pm Solitaire Robertson; Becca Adams meeting notes from Thursday 2nd feb

**Caution:** This email originated from outside the council. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Solitaire and Becca,

Please find my take of our discussion last week. Please amend as you see fit, and/or pad out extra details. Thanks

Notes from Teams meeting Thursday 2<sup>nd</sup> February

Carterton District Council: Becca and Solitaire

Stradegy : Claire Price and Matt Morley

Purpose: to discuss the consenting matters in relation to a solar farm proposal at Cornwall Road, south of Masterton.

- 1. Aware that another similar sized solar farm in the Wairarapa was accepted and progressed through Covid fast track process.
- 2. A larger solar farm proposal in South Wairarapa received a significant backlash from the community.
- 3. The site is a good location for this type of activity, based on surrounding land uses contractors yard, substation, composting activity, sensitive receptors are not located close by.
- 4. Adversely affected parties decide upon outcome of landscape and visual assessment and degree of significance on Hood Aerodrome.
- 5. Do not consider Waka Kotahi (previously known as NZTA) to be adversely affected, new roundabout is going at intersection with SH2.
- 6. If GWRC are satisfied with earthworks in flood hazard area, then CDC will be follow their lead.
- 7. Get flood hazard information from GWRC.
- 8. Community in the area have been tolerant to date on changes composting activity etc.
- 9. NPS HPL pathway through 'specified infrastructure' to be explained in the application.
- 10. Manawhenua contact Ra at Ngāti Kahungunu ki Wairarapa and refer to Solitaire's introduction.
- 11. Note the landowner has a number of consents by other organisations namely Higgins Construction who have consent to quarry river gravels across the site. The quarrying has started but not within the area of the solar farm. The composting (NZ Compost) has an operation east of the site, close to the river. An application has been lodged for another gravel extraction activity south of Hughes Line.

### CLAIRE PRICE BRP(HONS) MNZPI

SENIOR PLANNER

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### Document 2

#### Serah Pettigrew

From:
Sent:
To:
Cc:
Subject:

Claire Price S 7(2)(a) Wednesday, 21 February 2024 10:10 am Solitaire Robertson; Becca Adams Matthew Morley RE: 51, 99 and 107 Cornwall Road proposed solar farm, Rural Zone, Activity Status check

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Ok great.

Many thanks.

From: Solitaire Robertson <solitaire@cdc.govt.nz> Sent: Wednesday, February 21, 2024 10:08 AM To: Claire Price (S /(2)(a) Becca Adams <becca@cdc.govt.nz> Cc: Matthew Morley (S /(2)(a)

Subject: RE: 51, 99 and 107 Cornwall Road proposed solar farm, Rural Zone, Activity Status check

Hi Claire, I am in meetings today then heading off on annual leave I will respond next week.

In the meantime I will send you an email with a link to some of the swdc solar farms where there is a couple of rule interpretation opinions

Cheers

Solitaire



**SOLITAIRE ROBERTSON** | Planning & Regulatory Services Manager | **CARTERTON DISTRICT COUNCIL** Phone: 06 379 4030 | DDI: 06 379 40 48 | Email: <u>solitaire@cdc.govt.nz</u> PO Box 9, Carterton 5743 | 28 Holloway Street, Carterton 5713 | Website: <u>www.cdc.govt.nz</u>

From: Claire Price **Control** (2)(a) Sent: Wednesday, February 21, 2024 10:05 AM To: Solitaire Robertson <<u>solitaire@cdc.govt.nz</u>>; Becca Adams <<u>becca@cdc.govt.nz</u>> Cc: Matthew Morley **S** 7(2)(a) Subject: 51, 99 and 107 Cornwall Road proposed solar farm, Rural Zone, Activity Status check

**Caution:** This email originated from outside the council. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Solitaire & Becca,

We thought we would take this opportunity to update you on how things are tracking with the solar farm proposal at Cornwall Road.

It should be noted also that the applicant has changed the site as per the Image below:



In terms of where we are at, we are currently working with technical expert on having the reports and plans finalised before preparing the resource consent application. I noter also that initial consultation has been undertaken with Rangitāne o Wairarapa and Ngāti Kahungunu ki Wairarapa.

To keep you informed, we are aiming to have the application into Council by the beginning of April.

On another note, we have completed our District Plan Compliance analysis which has informed the activity status of the application and would like to have this confirmed with you.

Section 4.5 directs plan users to assess a proposed activity under Chapter 21 District Wide rules first, and then return to the Rural Zone provisions.

#### Permitted activities

- 21.1.20 Flood Hazard Area if the following don't apply:
- (a) (i) non-habitable structure greater than 4m , GFA of  $15m^2 = \frac{\text{applicable}}{\text{(ii) earthworks of more than } 20m^3 = \frac{\text{applicable}}{\text{applicable}}$
- 21.1.24 Network utilities and Energy Generation Facilities N/A

21. 2 Controlled Activities N/A

21.4 RDA 21.4.7 Flood Hazard Area that did not comply with permitted activity in 21.1.20

#### 21.6 Discretionary Activities

21.6(a) Any activity that does not comply with the standards for permitted activities or <mark>is otherwise not specified</mark> as a controlled, or restricted discretionary activity.

- The flood hazard is specified as RDA.
- New renewable energy activities are not specified anywhere, only new wind energy facilities (Rule 21.6(j)).

Where does that leave new solar farm activities?

Returning to the Rural Zone

#### **Permitted Activities**

The following are permitted activities:

- (a) Any activity listed as a District Wide Permitted Activity in the rules in Section 21.1, and which complies with the relevant standards in those rules and Section 4.5.2, and which is not otherwise specified as a controlled, restricted discretionary, discretionary or non complying activity under Sections 4.5 or 21. n/a renewable / solar farms not listed as a permitted activity in Chapter 21.
- (b) Any activity not listed as a District Wide Permitted Activity in the rules in Section 21.1, and which complies with the relevant standards in Section 4.5.2, and which is not otherwise specified as a controlled, restricted discretionary, discretionary or non complying activity under Sections 4.5 or 21. Applicable new renewable energy activities are not specified, and are only caught by the default rule in 21.6(a).

To conclude, the proposal is unable to meet standards 21.1.20(a)(i) and (ii) as there will be buildings with a GFA greater than 15m2 and earthworks will exceed the permitted amount within the Flood Hazard Area. Noting that this is the only aspect of non-compliance with the performance standards, our understanding is that the proposal triggers a **Restricted Discretionary Activity** status pursuant to Rule 21.4.7.

A new energy facility / renewable electricity generation activity / a solar farm activity is not specifically provided for in Chapter 21, unlike a wind energy activity, and so falls to the default rule of Rule 21.6(a). However, when going through Rural Zone Rule 4.5(b), does this return the activity status of a new renewable energy facility to permitted – because it is not specified in Chapter 21. Or does Rule 21.6(a) prevail and the activity status for a proposed solar farm land on discretionary?

We also understand that the proposal also triggers a **Restricted Discrtetionary Activity Status** under Rule ENG-R5(2) of the Proposed District Plan as it is located within a moderate hazard area (i.e. flood) and is larger than 1ha in area (standard ENG-S2) and that these rules are to be given legal effect.

We would appreciate if Council could please confirm how we treat the provision of new solar farm proposals through the Rule Zone and District Wide activity rules, and whether they revert to 21.6(a) or 4.5(b).

#### Site Access:

The operational access of the solar farm, is likely to reuse the existing access at 109 Cornwall Road. Can you let me know if there are any existing consents operating at this site please?





Happy to discuss this in a Teams meeting if necessary.

Regards,

CLAIRE PRICE BRP(HONS) MNZPI SENIOR PLANNER

DAYS OF WORK: 8.30AM – 2.30PM MONDAY, TUESDAY, WEDNESDAY, THURSDAY

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### **Resource Consent Application for Land Use**

51, 99 and 107 Cornwall Road, Masterton

Masterton Solar Farm Ltd

24023 AP1 16<sup>th</sup> April 2024

## **APPLICATION DETAILS**

**Consent Authority:** 

The Applicant:

Address for Service:

Address for Invoice:

**Carterton District Council** 

Masterton Solar Farm Ltd

Stradegy Planning Limited, PO Box 239, Napier 4140

c/- The Advisory Group s 7(2)(a)

#### Site Details:

Street Address: Legal Description: Certificate of Title: Area: Zone:

Street Address: Legal Description: Certificate of Title: Area: Zone:

Street Address: Legal Description: Certificate of Title: Area: Zone:

#### 51 Cornwall Road, Carterton

Lot 2 DP 325931 104927 53.1241ha Special Rural

#### 99 Cornwall Road, Masterton Lot 1 DP 75496 42D/409 and 10.01ha Special Rural

#### 107 Cornwall Road, Masterton LOT 2 DP 88515 BLK VIII TIFFIN SD 56B/59 2.6420 Special Rural

#### Activity for which Consent is sought:

#### **Operative District Plan (ODP)**

Resource Consent is sought to establish, operate and maintain a solar farm and associated activities. The proposed activity requires the following consents:

- Discretionary activity for a non-specified activity under Rule 21.6(a).
- Restricted Discretionary Activity for earthworks and non-habitable structures within the Flood Hazard Area under Rule 21.4.7

#### **Other Resource Consents**

Land use consent under R106 of the Natural Resources Plan for earthworks associated with a renewable energy activity.

Prepared by:

s 7(2)(a)

Claire Price BRP(HONS) MNZPI Senior Planner

#### **Reviewed and Approved for Release by:**



Matt Morley BEP Intermediate Planner

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#### Appendices –

- 1. Record of title
- 2. District Plan Compliance Assessment
- 3. CF Projects: Drawing Set and Civil Assessment

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- 4. Wayfinder: Landscape and Visual Assessment
- 5. ECC: Transport Assessment Report (TAR)
- 6. Marshall Day: Acoustic Assessment
- 7. Forbes Ecology: Ecological Values Assessment
- 8. AgFirst: Production Capacity Assessment
- 9. Aurecon: Glint and Glare Assessment
- 10. EAM: PSI Assessment
- 11. Draft Conditions
- 12. Policy Analysis



### 1. INTRODUCTION

The applicant, Masterton Solar Farm Ltd, seeks land use consent to establish, operate and maintain a ~25ha solar farm over land at 51, 99 and 107 Cornwall Road, Carterton. These three properties comprise of a total site area of 65.8ha and is zoned **Special Rural Zone** under the Combined Wairarapa District Plan.

The proposed activity comprises construction and operational structures and activities, and associated land use, as described in full in Section 3 of this application, with development drawings provided in **Appendix 3**. Refer to **Appendix 2** for a district plan compliance assessment.

The proposed activity is assessed and considered as a **Discretionary Activity** under the applicable rules and performance standards of the Combined Wairarapa District Plan (the Operative District Plan).

The applicant offers up draft conditions as set out in **Appendix 11** to support and manage effects of the proposed activity.

The following technical assessments support the application:

- CF Projects, Civil Design Report (earthworks and stormwater), Appendix 3
- Wayfinder, Landscape Assessment, Appendix 4
- East Cape Consulting, Transportation Assessment Report (TAR), Appendix 5
- Marshall Day, Acoustic Assessment, Appendix 6
- Forbes Ecology, Ecological Values Assessment, Appendix 7
- AgFirst, Productive Capacity Assessment, Appendix 8
- Aurecon, Glint & Glare Assessment, Appendix 9
- EAM, PSI Assessment, Appendix 10

The conclusions reached in the assessment of environmental effects in Section 7 demonstrate that the rural context and location of the site, its characteristics, and design of the proposed solar farm and its infrastructure can support a renewable energy activity of this scale and nature without generating more than minor effects on the environment.

Section 8 considers the actual and potential adverse effects on persons at adjacent properties. The findings from this assessment are that the effects are less than minor at each of the identified properties.

The policy analysis against relevant statutory documents demonstrates that the proposed activity is consistent with the direction provided for solar farms/renewable electricity generation and the management of adverse effects on the environment.

Overall, the proposed activity is considered to be deserving of consent pursuant to sections 104 and 104B of the Resource Management Act 1991.

The following report has been prepared in accordance with Schedule 4 of the Resource Management Act (the RMA) and meets the requirements of Form 9. The level of detail provided is commensurate to the scale and significance of the effects that the activity may have on the environment.

Resource Consent Application for Land use 51, 99 and 107 Cornwall Road, Carterton 24023\_App1 | 16<sup>th</sup> April 2024

### 2. SITE AND SURROUNDS

#### 2.1 The Site

#### **General Location**

The site comprises three titles of land at 51, 99 and 107 Cornwall Road, and has an area 65.8ha. There are no interests on the titles that restrict or prevent the proposed activity. Refer to **Appendix 1** for the Certificates of Title.

Figure 1: Subject site comprising 1 (51 Cornwall Rd), 2 (99 Cornwall Rd) and 3 (107 Cornwall Rd)



The site has frontage to Cornwall Road to the south-west and State Highway 2 to the north. The Waingawa River is on the north-eastern boundary and the Masterton substation to the south. Refer to **Figure 2**.

The extent of the proposed solar farm is only a portion of the larger site area and largely confined to the lower terrace, adjoining the Waingawa River riparian buffer, and set back from the river between 25m - 75m. The extent is shown on the **Figure 3** below.

The three connections that extend from the solar farm are for access and cable connections. The vehicle access and roads/tracks into the site already exist and are used by the existing farm and contracting business that operate at the site. The cable will be undergrounded.

The site is zoned Special Rural under the Combined Wairarapa District Plan (refer to **Figure 3**). Transpower's Mangamaire to Masterton 110kV high voltage transmission line is shown by the red line on the Planning Maps. Support structures of these lines are single circuit single poles.





Figure 3: Operative District Plan, Special Rural Zone.



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The Proposed Combined Wairarapa District Plan (the Proposed Plan) zones the site as General Rural Zone and shows the high voltage overhead lines on the planning maps. Refer to **Figure 4**.

 Figure 4:
 Proposed District Plan: General Rural Zone and National Grid 110kV overhead line

 Source: Proposed District Plan Maps,

https://wairarapa.maps.arcgis.com/apps/webappviewer/index.html?id=dbe50e1d19ff4f4c91b7ff4598576fba



The temporary accesses are shown by the dashed lines on **Figures 3** and **4**. The permanent access will extend from 107 Cornwall Road driveway and enter 99 Cornwall Road and follow the fence line with 107 Cornwall Road. The permanent access is shown by the bold lines.

The dotted line shows the proposed 5m wide corridor for the underground cable used to convey the electricity from the solar farm to the 33kV Powerco line at Cornwall Road. Refer to **Figures 3** and **4**.

#### Topography and Contour

The site extends over two terraces in between Cornwall Road and the Waingawa River; a lower (**Photo 1, 3** and 4) and upper terrace (**Photo 2**). The extent of the solar farm is on the lower terrace, with access to this farm via the upper terrace. The site is situated at approximately 215m above sea level. Refer to the lidar data presented in the drawing set in **Appendix 3**.

Resource Consent Application for Land use 51, 99 and 107 Cornwall Road, Carterton 24023\_App1 I 16<sup>th</sup> April 2024

#### **Photo 1**: The lower terrace and location of the solar farm.



Photo 2: The upper terrace and boundary shown by the shelterbelt



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**Photo 3:** Within the lower terrace – view towards the substation in the distance. Shelterbelts indicate the furthest extent of the solar farm.



Photo 4: Within the lower terrace and view towards the riparian buffer of the Waingawa River



#### Existing land use

The landowner leases the properties at 51 and 99 Cornwall Road in conjunction with other land and the site is currently used for cattle grazing. The 2.6ha property at 107 Cornwall Road supports rural industrial activities. The current use is shown in **Figure 5**, taken from the Ag First Report.



Figure 5: Features at the site, Source: AgFirst Assessment of proposed solar farm, Cornwall Road, page 7

#### Land use capacity

Over the two terraces within the site, the upper terrace on the southern side is largely land use capacity #3 (LUC 3), whereas the lower terrace adjoining the Waingawa River is LU6. The lower terrace is the location of the proposed solar farm, with ancillary activities (cable corridor and internal access road) extending through the upper terrace to connect to Cornwall Road. This is shown on **Figure 6** below.

 Figure 6:
 Proposed District Plan: Highly Productive Soils overlay:

 Source: Proposed District Plan Maps,

 https://wairarapa.maps.arcgis.com/apps/webappviewer/index.html?id=dbe50e1d19ff4f4c91b7ff4598576fba



Land use capacity (LUC) 3 is classified as Highly Productive Land (HPL) under the interim provisions of the National Policy Statement for Highly Productive Land (NPS HPL). This delineation mirrors the extents set out in the Proposed District Plan Highly Productive Land, as shown on **Figure 6**. The AgFirst Report in **Appendix 8** of this application goes into detail of the soil characteristics and other influential factors on production capacity.

The subject site is in the Carterton district. This district is comprised of different land use types; by number of farms, 59% are sheep and beef, 14% dairy, 8% forestry, 7% other livestock, 4% Grain and crops and other land uses such as vineyards, orchards and fruit and other horticulture. Overall, the district is 117,997ha with 24,665ha classed as HPL and this is predominantly LUC 3 land.

Land in the immediate vicinity of the subject area is of similar LUC class and soil type to the east and north along the river margin, with a large section of highly productive land to the south and west of the site, that is mainly sheep and/or cattle grazing.

Resource Consent Application for Land use 51, 99 and 107 Cornwall Road, Carterton 24023\_App1 I 16<sup>th</sup> April 2024



#### Road and Rail

The strategic road network in the vicinity of the site is provided by State Highway 2 (SH2) which connects the south through the Wairarapa and Wellington, and north towards Hawkes Bay. SH2 is managed by Waka Kotahi. There is no nearby rail corridor to the site.

Cornwall Road meets SH2 at a crossroad intersection with Norfolk Road forming the north-western leg.

Under the Operative District Plan roading hierarchy the roads have the following classifications:

- Norfolk Road is classified as a *primary collector road*.
- Cornwall Road is classified 1 as a secondary collector road.
- Hughes Line is classified as a *low volume road* (east of Cornwall Road) and an *access road* (west of Cornwall Road).

The site has frontage to Cornwall Road, and Hughes Line. However, the Hughes Line frontage is part of the larger property boundary that is not utilised by the proposed solar farm and so is not relevant to the application.

Cornwall Road is sealed and approximately 6.5m wide and provides one traffic lane in each direction. There are no road markings other than at the road intersections and the posted speed limit is 100km/h. The vertical alignment is straight and flat, overhead power lines have been erected along both sides and the Taratahi Water-race follows the north-east (site) side of Cornwall Road.

Views of Cornwall Road are shown in Photos 5, 6 and 7 below.

 Photo 5:
 Cornwall Road looking north-west, red arrow shows the location of the existing access at 107

 Cornwall Road.
 Source: ECC, TAR, page 5, annotation by Stradegy



Using the One Network Road Classification (ONRC) categories given in Mobileroad.org.

Photo 6: Cornwall Road looking south-west, existing access at 107 Cornwall Road is identified by red arrow. Source: ECC, TAR, page 5 annotation by Stradegy



 
 Photo 7:
 Cornwall Road looking north-west, showing Taratahi Water Race, Source: ECC, TAR, page 5 annotation by Stradegy



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#### Infrastructure

The Transpower NZ Limited (Transpower) Masterton substation is located immediately south and directly abuts the subject site. Refer to **Photo 8** and **Figure 8**.

 Photo 8:
 Masterton Substation, 113 Cornwall Road, immediate south-east of the site

 Source: Stradegy Planning, January 2023



#### Figure 8: Transpower's Infrastructure, Source Maps and GIS Data | Transpower



Overhead lines connect to the Masterton substation and traverse the north-west end of the subject site. These overhead lines are as follows:

• Mangamaire – Masterton A, (MGM - MST-A), and has a 110kV design voltage

The support structures on the site are single circuit single poles and one steel tower and are uniquely referenced as follows:

- MGM-MST- A0442 A0441 (Single Circuit Steel Tower)
- MGM-MST- A0442 A0448

The applicant is aware of Operative District Plan consent requirement if the buildings are proposed within 20m of a high voltage transmission line. This rule is applicable to the Transpower overhead lines, and the proposed solar farm avoids any buildings within 20m either side of the centreline of the corridor that goes through the site. The New Zealand Code of Practice for Electrical Safe Distances (NZECP34) is also applicable and covers a greater range of activities, including earthworks and use of mobile equipment in proximity to the overhead lines and support structures.

The local electricity distribution network is Powerco whose network runs along Cornwall Road. The applicant acknowledges that the NZECP34 is relevant to any works or structures in the vicinity of this local infrastructure.

#### Ecology

Forbes Ecology Limited was engaged to undertake an ecological assessment of the site and report on findings which supports this application in **Appendix 7** of the AEE. The report explains the methodology used and it involved desktop analysis and site walkover to assess ecological features on site. The conclusions made within the report are summarised as follows:

- The soil classification is Typic Fluvial Recent Soils which are of hard sandstone rock parent material.
- The soils are well drained, with rapid permeability and no slowly permeable horizon.
- The soils are of moderate drought vulnerability (S-Map, 2023).
- The site is in improved pasture and is grazed with cattle.
- Historically the land supported a series of natural drainage channels. In the current context none of these channels are anything more permanent than ephemeral status. As such there are no Rivers on site in terms of the RMA (1991) definition.
- There are no inland natural wetlands present, probably due to a combination of catchment size, free draining ground conditions and a relatively dry climate.

There are no implications for development of the site with respect to the GWRC RPS Policy 23, National Policy Statement for Freshwater Management wetland and waterway provisions, or the NPS-IB SNA/ecological significance criteria.

Figure 9:View south over lower terrace and towards shelterbelt that marks the extent of the solar farm<br/>to the south. Pasture species dominant and vegetation cover of the site.<br/>Source, Forbes Ecology, 2023



#### Natural Hazards

The Operative and Proposed District Plan maps identify the proposed solar farm site is within a flood hazard area. The Operative District Plan includes flood risk maps prepared by Greater Wellington Regional Council (GWRC) which shows where land is likely to be subject to 1:50 year (2% Annual Exceedance Probability (AEP)) and 1:100 year (1% AEP) floods. The Proposed District Plan flood hazard maps, (Upper Raumāhanga) are based on Greater Wellington Regional Council's data produced for the Floodplain Management Plans for these rivers. These maps also delineate between stream corridor, overland flow path and ponding hazard areas.

The extent of the proposed solar farm avoids the high hazard area shown on the Proposed District Plan maps (the dark blue) in **Figure 10**. Overland flows and inundation areas are shown in light green and light blue, and these are applicable to the north-eastern area of the solar farm, closest to the river corridor.

The hazard risk and potential effects from flooding, the way the project avoids and minimises these potential effects is assessed by CF Projects in their Preliminary Civil Infrastructure Report (**Appendix 3**). The assessment within the report has been made in consultation with Greater Wellington Regional Council and correspondence is included with CF Project's findings.

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 Figure 10:
 Proposed District Plan Flood Hazard Overlay (1% AEP), Source: Proposed District Plan Maps,

 https://wairarapa.maps.arcgis.com/apps/webappviewer/index.html?id=dbe50e1d19ff4f4c91b7ff4598576fba



#### **Cultural Values**

Two mana whenua groups were identified using the Te Puni Kōkiri directory of iwi and Māori organisations, as well as advice from staff at the Carterton District Council. The mana whenua groups are:

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

The subject site is located within an Area of Interest (refer to **Figure 11**) identified in the Rangitāne o Wairarapa and Rangitāne o Tamaki nui-ā-Rua Area Deed of Settlement.

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The Waingawa River is a tributary of the Ruamahanga River. The Ruamahanga River (and its tributaries) is included in Statutory Acknowledgement Area (OTS-204-05). It is understood that where a statutory acknowledgement relates to a river, lake, wetland or coastal area, the acknowledgement only applies to that part of the bed in Crown ownership. The site is not on or adjacent to a bed of a tributary in Crown ownership, therefore is not within the identified area of OTS-204-05. Refer to **Figure 12**.

**Figure 12:** Ruamahanga River (and its tributaries) Statutory Acknowledgement Area (OTS-204-05). Site shown by the red diamond (



Figure 11:



The subject site is located within an Area of Interest (refer to **Figure 13**) identified in the Ngāti-Kahungunu-ki-Wairarapa-Tamaki-nui-a-Rua Deed of Settlement. There are no statutory acknowledgment areas within this settlement on or adjacent to the site.



#### Figure 13: Area of interest - the Ngāti-Kahungunu-ki-Wairarapa-Tamaki-nui-a-Rua

The Taiao Groups representing both mana whenua groups were contacted in August 2023 and since then have provided updated information on the project. The details of the engagement and consultation are set out in Section 6 of this application.

#### Surrounding Environment / Character and amenity

The proposed site sits on the flat plains between the Tararua Ranges and the east coast, in the southeast of the north island of New Zealand, approximately 5km south of the centre of Masterton and approximately 13km east of the Tararua Ranges in Wairarapa. SH2 runs through Masterton in a generally north-south direction.

The landform is generally flat, situated in a lowland basin extending from Mt Bruce in the north to Carterton in the south. The Tararua Ranges rise sharply to the west, providing shelter from the westerly wind and a sense of protection and orientation; the lowland basin extends out to the east coast.

The broad semi-braided Waingawa River flows east from the Tararua Ranges and, along with numerous tributaries, joins the Ruamahanga River to continue south.

The area enjoys a mainly warm dry climate sheltered by the Tararua Ranges. Summers are dry and mostly settled with temperatures ranging from  $20 - 28^{\circ}$ C. Winters are cool to mild; frosts are common with temperatures between 10 and 15°C. Wind can be common in Spring and Summer gathering strength coming down the Tararua Range and out to the coast. The sky is a big feature, with the Tararua Ranges dominating the western horizon.

Farming, cropping and horticultural activities along with lifestyle blocks permeate the landscape creating a constantly changing vista. The landscape is therefore transient by nature as the orchards and cropping species rotate through the seasons and associated farming machinery is often seen on the rural roads moving between locations. Mature vegetation is mainly exotic, found as shelter belts and hedge rows with an occasional remnant of native bush.

Localised to the site, the following activities neighbour and / or are in the general locality that characterises the area:

- The Waingawa Industrial area, across State Highway 2 (SH2), is Wairarapa's main heavy industrial area, where large industrial activities have been co-located. A number of industrial activities occur such as a timber mill, a wool and farm supply business along with a truck stop, reinforcing the eclectic nature of the area.
- SH2 significant transport infrastructure linking towns and rural areas north south.
- Ballance Agri nutrients fertiliser service centre is located at 4022 SH2, immediate west of the proposed site on the southern corner of Cornwall Road and State Highway 2.
- The Masterton substation located immediately to the south-east at 109 Cornwall Road. Significant nationally important infrastructure that is easily recognisable due to buildings, facilities and overhead lines extending from it over the site.
- Rural industrial activities adjoining the Waingawa River and adjoining the site to the east of Hughes Line.

Photo 10:	Surrounding area, from Hughes	Line	view we	<mark>s</mark> t towards	Waingawa	Industrial	Hub Source:
	Stradegy Planning, January 2023						





#### **Existing Sensitive Activities**

A sensitive receptors map (Refer to **Figure 14**) has been developed to identify properties adjacent to the proposed solar farm. The sensitive receptors map is used by all the technical reports considering effects on adjacent properties and the wider environment.

# Figure 14: Sensitive Receptors Map and photo references (numbered orange circles). Source, Wayfinder, LVA, Drawing Set



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# 3. DESCRIPTION OF PROPOSAL

The applicant, Masterton Solar Farm Ltd, seeks land use consent for the construction, operation, and maintenance of a proposed solar farm at 51, 99 and 107 Cornwall Road, Masterton. The scale of the proposed solar farm enables the generation of circa 12.5MW(AC) of renewable electricity which is equivalent to powering approximately 4,000 homes. The electricity generated will supply the National Grid and is considered to be regionally significant infrastructure as defined in the Greater Wellington Regional Policy Statement.

The applicant has received confirmation from Powerco that their network has the capacity to accommodate the proposed solar farm connection to their existing network in the Masterton area. Powerco's network enables the electricity from the solar farm to be conveyed to the Masterton substation and National Grid.

The details of the proposal are set in the following sections:

- Introduction
- Site Selection Process
- Extent and Form of the Proposed Solar Farm
  - Buildings, structures, roads, landscaping,
  - Operations
  - Decommissioning
- Construction
  - Construction activities and management
  - o Earthworks

### 3.1 Introduction

The extent of the proposed solar farm boundary and site access are set elements to the concept site plan in the Drawing Set (**Appendix 3**). The internal layout of the solar farm shown is a concept which will develop further as it progresses through a detailed design phase, post consent approval.

A detailed design phase will result in the precise and final location of solar panel arrays, internal roads, site compound (and facilities within it) and the power conversion units (PCUs); giving the applicant scope to ensure the final design is as efficient as possible. An updated Site Plan and Drawing Set will be produced detailing the final design.

To enable flexibility to develop and alter the internal layout, the applicant offers up a suite of draft conditions setting the requirement of a final site plan and layout be submitted to Carterton District Council (TDC), prior to commencement of the implementation of the consent.

This application describes all the components required by the solar farm and the adverse effects of these on the environment, both actual and potential, that have been assessed. The information presented in this application sets a "maximum effects envelope" for the proposed solar farm and the flexibility sought will not undermine the effects assessments demonstrated in this application. Where there are variable design parameters within the "maximum effects envelope", such variability has been assessed and it is expected that within the detailed design process, compliance can easily be achieved within the District Plan rules on noise, carparking design, buildings, structures, internal road design and other facilities as described in this application.

### 3.2 Site Selection Process

The applicant has described the site selection process in the following paragraphs, to demonstrate why the subject site is optimal for a solar farm project of the scale sought in this application.

There are several key technical and economic parameters that any viable solar farm development site must meet, or go a long way to meeting, before it can be considered suitable for progressing. Of key importance are:

- proximity of the site to existing National Grid infrastructure;
- a site that is predominantly flat land free from significant natural hazards, significant natural areas, outstanding natural landscapes and features;
- a site that imparts no or low impact to nearby sensitive receptors; and a
- willing landowner agreeable to a long-term lease arrangement.

The subject site was ultimately selected as a suitable site to progress based on the above criteria being met following the below process:

- 1. Initially the New Zealand transmission network was identified and mapped using GIS software. This included both substations and overhead lines.
- The voltage of substation and overhead line assets were then noted and lower voltage assets 33kV and below were identified. These lower voltages are suitable for smaller solar farm sites in the region of 25-40Ha.
- 3. GIS software was then used to identify flat land and LINZ information for sites within proximity, being no more than 1-2km, from an 11kV or 33kV substation or centre point of an overhead line.
- 4. In addition, detailed planning layers and constraints were loaded into the GIS software.
- 5. The outputs were then individually assessed to determine whether the impact of the potential site was zero or a low impact to nearby receptors.
- 6. Following the above selection criteria, a significantly reduced number of suitable sites were yielded.
- 7. Landowners for these sites were then contacted.
- 8. The response from the Landowner for the subject site was the only positive response received from the sites contacted in the Masterton area.

### 3.3 Extent and Form of the Proposed Solar Farm

The spatial extent of the solar farm is approximately 25ha in area, and this area will be occupied by solar arrays (solar panels and trackers). A deer fence shall run the perimeter of the proposed extent and shall not exceed 1.8m. Security cameras will be installed pointing nose to tail on the perimeter fence as a precautionary security measure.

### Setbacks

The solar farm does not front any roads, except for an underground 33kV cable route corridor between the proposed solar farm and Cornwall Road.

The following setbacks apply on the external property boundaries and road frontages:

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### Cornwall Road (south-west)

- The extent of the solar farm (solar panels and trackers) is setback ~225m,
- An underground 33kV cable connection from the solar farm to Powerco's network extends to Cornwall Road. Infrastructure required includes a small kiosk building (~3m x 3m) and cable connection (over or under the Taratahi Water Race). The infrastructure required is to be designed and located in a way that satisfies the requirements from Powerco and Carterton District Council as overseer for the Taratahi water race.

#### State Highway 2 (north-west)

• The extent of the solar farm is setback ~315m.

#### 593 Cornwell Road (property to the south)

• The extent of the solar farm is setback ~160m.

### Form of the Proposed Solar Farm

The scale and form of the proposed solar farm includes the structures, facilities and ancillary activities described below and shown on the Concept Site Plan in **Appendix 3**, and includes:

- A site compound (a level metalled area),
- Grid connection point circuit breaker kiosk building,
- Solar panels and single axis tracking system,
- Power Conversion Units (PCUs),
- Electrical equipment including cabling above and below ground,
- The use of an existing vehicle access on Cornwall Road, for construction and long term access
- One additional short term construction access also on Cornwall Road
- Internal roads

### Site Compound

A site compound is positioned on the south-west of the proposed solar farm. The compound is accessed from Cornwall Road, via a new internal access road extending from the existing contractors' yard on the site. The site compound is an open area, free of any solar array infrastructure and will have the facilities listed below provided within it. The facilities are indicatively shown within the Site Compound on the Concept Site Plan. The exact placement within the Site Compound will be confirmed during detailed design.

The maximum height of any buildings on site shall not exceed 4m from existing ground level.

### Maintenance and storage buildings

Maintenance and storage buildings will be converted shipping containers. The size of these buildings is approximately 3mW x 12mL and 3mH and painted a dark grey recessive colour.

### Water tank

A 5,000-10,000L water tank with approximate measurements of 2m diameter x 2.5m height. The water tank will be filled from a tanker.

### On-site operations carparks

The site compound will accommodate up to four (4) on site carparks, for use by maintenance and operations

staff, or any visitors to the site.

### Loading area

An on-site loading area is to be provided and shall be designed so that there is sufficient on-site maneuvering area for all vehicles to exit onto Cornwall Road in a frontwards manner via the temporary construction access.

### **Kiosk building**

A kiosk building (refer to **Figure 15**) measuring approximately 3m x 3m and 2m in height will be positioned on the frontage with Cornwall Road. The kiosk building houses the 33kV circuit breaker that takes the 33kV electricity from the proposed solar farm and connects it to the adjacent 33kV distribution line that runs into the Masterton substation. The setback from the Taratahi water race has yet to be determined and shall be confirmed through a detailed design process and agreed to by the overseer of the Taratahi Water race and CDC's Operations Manager.





### Solar panels and trackers

The solar panels (approximately 1.1m wide and 2.5m in height) are comprised of polycrystalline or monocrystalline silicon wafer cells. Solar panels are sealed, and the material contained within them is not corrosive and during rainfall does not discharge contaminants to the ground. The panels are designed to absorb rather than reflect light.

Depending on the power rating of each solar panel, the number of panels could range between 25,000 – 35,000. However, the length of each row of solar panels will vary depending on the ground underneath and the span that can be effectively achieved. The rows of solar panels are laid out on a north-to-south alignment, with an open space corridor of circa 6m between each row of solar panels. The corridors between the panels will remain in pasture.

The single axis tracker mounting structures that support the solar panels are built from steel and are mounted on piles that are either driven or screwed into the ground, depending on the ground conditions and design requirements. The single axis tracker tracks the sun over the day to maximise the solar energy falling on the solar panels, from the east in the morning, through to the west in the afternoon.

The tracker support system (Refer to **Figure 16**) includes a torque tube that runs parallel to the ground, turning as it rotates the solar panels during the day. The height of the torque tube above ground is typically 1.6m but is dependent upon the design and topology. The height above ground will naturally vary as the tracking system is designed to sit atop undulating ground. Taking into consideration the potential height changes of the tracking system to accommodate ground level changes, the combined height of the panels and tracking system will not exceed 4m from existing ground level when the panels are tilted at their maximum angle.

Figure 16 shows the single tracker support system, torque tubes, and a typical row of solar arrays.



### Power Conversion Unit (PCUs)

The electrical collection and conversion systems, including inverter and transformer units, are referred to as Power Conversion Units (PCU's). PCUs convert the DC electricity collected from the solar array into AC electricity, increase the voltage to match the 33kV distribution grid voltage, and then export the 33kV electricity into the local distribution network via the nearest 33kV overhead line that is then connected to the Masterton substation.

PCUs are skid mounted on a raised concrete pad or pile with footprint of circa 40ft x 10ft. The maximum height of these facilities above the existing ground level will not exceed 4m plus freeboard if required. PCUs are typically aligned with the internal roads to provide access during construction and operation of the facility.

The Acoustic Report supporting this application (Refer to Appendix 6 for the Marshall Day report)



The proposed solar farm is to accommodate up to six PCUs across the site. The final number and locations of the PCUs will be confirmed as part of detailed design. The draft condition framework offered in this application requires confirmation of compliance with the applicable noise levels alongside the final site and layout plan to be submitted to CDC prior to commencement.





Figure 18: Typical Skid-Mounted Power Conversion Unit



### **Electrical Equipment**

Electrical equipment on site includes the following:

- String Combiner Boxes
- Both direct buried and above ground DC and AC cabling
- Internal AC 33kV reticulation system
- Weather stations

### String Combiner Boxes

A 'string' consists of a number of solar panels, typically 25 - 30 panel in series. Each of the strings feed power back to a combiner box where the power output from a number of strings is combined into a single DC cable, that then transfers the power to the PCU. Each combiner box consists of a box located on a pole typically around 1m above ground level. DC isolator switches will also be mounted at this location to allow the safe isolation of equipment for maintenance purposes.

### Direct buried DC and AC cabling

The solar panel string cabling will be run on the underside of the solar panels or in cable trays. The DC cabling running from the combiner boxes to the PCUs will be buried along with the high voltage 33kV cables.

### Internal AC 33kV reticulation system

The 33kV AC internal electrical reticulation system transfers power from the PCUs to the grid export point located on the 33kV feeder from Chapel to Masterton, located in close proximity to the Masterton substation. The cabling for this system will be buried in trenches run alongside the access roads, where possible, to reduce the footprint of the ground disturbance works, minimise the length of the electrical cabling and provide access for maintenance during the operational phase of the solar farm.

#### Weather stations

Weather stations (MET stations) will be installed in a selection of places throughout the solar farm. These pieces of equipment are typically 5m in height and provide information that is important for the operation of the facility.

### Site Access, Internal Road, Parking and Loading

### Site Access

An existing vehicle access at 107 Cornwall Road, located south-west of the proposed solar farm, is to be used during the operation of the proposed solar farm. An extension to this driveway is proposed on the western side of the offices – Refer to **Photo 13**. The existing vehicle access is used in conjunction with the existing activities at 107 Cornwall Road and is of a design standard that does not require any upgrades to enable its use during construction and operational activities of the proposed solar farm. Refer to Section 4.2 of the Transportation Assessment Report (TAR).

The temporary construction access is proposed at the existing 107 Cornwall Road access (Refer to **Photo 11**). Construction vehicles will move through the existing yard at (refer to **Photo 12**) and to through to the main site. Construction vehicles will exit at 51 Cornwall Road, using the existing farm access.

 Photo 11:
 Existing access at 107 Cornwall Road, and entry to rural contracting activity.

 Source: Stradegy Planning



Photo 12:The direction of the temporary construction access road (shown by the red arrow) at 107<br/>Cornwall Road. The temporary access shall use the existing contractor's yard to access 99<br/>Cornwall Road. Source: Stradegy Planning, dated January 2023



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#### **Internal Roads**

The Concept Site Plan shows an indicative layout of the internal roads for use during the operation of the solar farm. The final layout will be confirmed at a detailed design stage and plans demonstrating compliance with the descriptions below are to be submitted to Council for approval as part of draft conditions offered in the application.

The internal roads will have a formed width of 4m with a compacted and gravelled surface. The final design of the internal road and response to stormwater design will confirm the final road design and stormwater management as required. Refer to **Figure 19** for a typical cross section of the internal roads.





Figure 19: Typical cross section of the internal roads, Source: CF Projects, Drawing Set,

The stormwater design of the site is likely to utilise the swales of the internal roads, as a way of capturing, treating and attenuating any stormwater runoff. The solar panels will not collect rainwater, instead where any rain falls on the panels it will drip off the various surfaces and permeate into the grassed area below.

#### **On-Site Parking and Loading**

A permanent vehicle parking area will be part of the site compound area off Cornwall Road and will provide four (4) parking spaces for operational and maintenance staff and shall meet the required number of carparks when assessed on demand, rather than applying Table 21.1.25.1 of the Operative District Plan. The parking ratios set out in Table 21.1.25.1 do not provide a land use category that is directly applicable to a solar farm.

A demand-based provision is recommended by ECC in their TAR (refer to **Appendix 5**) of one parking space per employee (post construction) plus one visitor space is at maximum, three (3) spaces, whereas the four (4) will be provided within the Site Compound. In relation to accessible parking spaces for people with disabilities, one of the parking spaces is to have appropriate dimensions to function as an accessible space if needed. Because the site is expected to have only one or two employees this space would not need to be limited to only people with a disability, as it would be available regardless.

A loading area will also be provided within the site compound area to enable safe handling of goods during operations and maintenance.

#### Retention of existing vegetation

The retention of the existing vegetation is integral to the design, and is shown on the site plan and includes:
The existing shelterbelt which runs almost continuously along the western border of the proposed site.

The hedgerow which runs parallel to State Highway 2 along the northern border of the proposed site.

No further visual mitigation is proposed, as recommended by Wayfinder in their report (refer to Appendix 4)

### 3.4 Operations



### Staff on site

The proposed solar farm will be an unmanned operation therefore no site office or staff facilities are required. Maintenance staff will arrive and depart, but not remain on site for extended periods of time.

The entire solar farm will be monitored remotely through a supervisory control and data acquisition (SCADA) system that will monitor the performance of all the solar equipment onsite and enable remote control where required. The SCADA system will also be capable of notifying staff onsite and remotely of maintenance issues and assist in optimising the performance of the solar farm.

### Traffic Generation

The Transportation Assessment Report (TAR) sets out expectations on traffic generation for both the operational traffic and this is summarised below. Refer to **Appendix 5** for greater detail.

The proposed solar farm when it is operational, is expected to generate less than 10 vehicle movements per day (vpd). This is based on the following:

- Up to two staff (light vehicles) will arrive and leave site between 8am 5pm, Monday Friday, and
- The infrequent arrival / departure of heavy vehicles to site as and when new replacement components are required to be delivered.

### Noise

Marshall Day Acoustic engineers have assessed the operational activities of the proposed solar farm against the Operative District Plan noise standards at the nearest sensitive receptors beyond the site. Refer to **Appendix 6** for the Marshall Day acoustic report.

Noise limits for operational noise in the Rural Zone set under Rule 4.5.2 (f)(i) and are:

•	55 dB L <sub>A10</sub>	0700 – 1900 hrs
•	45 dB L <sub>A10</sub>	1900 – 0700 hrs
٠	75 dB L <sub>A10</sub>	2100 – 0700 hrs

Noise has been measured and assessed in accordance with NZS6801/6802:2008 and applies within the notional boundary of any dwelling in the Rural Zone.

The primary sources of noise expected from the operation of the proposed solar farm are from the PCUs, which can emit noise in-line with their power output i.e. the level of noise emitted increases as they produce more power.

The locations of the PCUs are not fixed and will not be finalised until detailed design of the project is undertaken.

At times, the PCUs will operate outside of the daytime noise limits (0700 – 1900), for example in the summer mornings or evenings. At these times the night time noise limits apply and require compliance with 45 dB  $L_{A10}$ , at the notional boundary.

The closest residential dwelling is at 573 Hughes Line and 577 Hughes Line. A 450m separation distance



The noise modelling includes a safety margin to account for special audible character.

The proposed solar farm can operate within the noise limits set by the Operative District Plan and a condition of consent is offered up requiring confirmation of compliance as part of the approved detailed design.

#### Agrivoltaics

The proposed solar farm is designed to enable sheep grazing to occur at the site. The dual use of sheep grazing and operating a solar farm has been termed 'agrivoltaics' and has benefits to both activities. The sheep maintain the grass and weeds in and around the site, while the solar panels provide additional shade for the animals. This dual use has been used in Australia and the UK and proven to keep the primary production capacity of rural sites in play while also supporting renewable energy projects. This agrivoltaic approach has been incorporated into the production capacity assessment by Ag First in support of this application.

#### Decommissioning

The expected lifetime of the solar farm is 40 years. At the end of this period the facilities will be decommissioned and the site rehabilitated to pasture and paddocks. The draft conditions offered by the applicant include a series of site rehabilitation conditions to be implemented once the 40 year term has expired, or at the end of the solar farm's operational life, these measures may be implemented earlier.

AgFirst conclude that the land area of the proposed solar farm will be able to return to its current state at the end of the solar farm's operational life and the soil surface returned to its current condition. Unless reused, the access roads and other compacted and gravelled surfaces within the solar farm can be returned to pasture. Infrastructure and buildings can be removed from the site. There is the technology to recycle components of solar farms. This technology exists in Europe and Australia and will continue to develop and is expected to be available to New Zealand in the future.

Conditions of consent are offered up to put in place the process and expectations from the decommissioning process and include:

- At least three months prior to the commencement of decommissioning of the Solar Farm, the consent holder must submit a Decommissioning Plan to the Team Leader Compliance & Monitoring, Carterton District Council for certification that it fulfils the requirements of the following conditions.
- 2. The Decommissioning Plan must be prepared by a suitably qualified and experienced person and meet the following objectives:
  - a. Decommissioning of the solar panels and all associated infrastructure in a manner that complies with all legislative requirements;
  - b. Leaving the land in a condition that is safe and suitable for the subsequent land use; and

 c. Ensuring that the components and infrastructure are disposed of in a way that maximises reuse and recycling. For any parts that cannot be reused or recycled, ensuring that they are disposed of in an environmentally responsible way in accordance with industry best practice.
 The Decommissioning Plan must include but not be limited to:

a. Details on all infrastructure to be decommissioned, including details, method and location of reuse, recycling or disposal and the reasons why the options have been chosen;

- b. Details of specific infrastructure to remain on-site post-closure and reasons why it will remain on Solar Farm site;
- c. Scheduling and timing for decommissioning; and
- d. Details for finished ground cover at completion of decommissioning and future intended land use.

### 3.5 Construction Activities

The construction of the proposed solar farm will generally involve the following activities:

- Site preparation earthworks including construction of laydown areas,
- Site access and internal road construction,
- Perimeter fencing,
- Installation of piles to mount the solar panel tracker on,
- Cable trenching,
- PCU pad construction,
- Site compound construction, including storage facilities, parking and loading area,
- Installation of the:
  - Solar panel tracker;
  - Solar panels;
  - DC and AC cables;
  - DC combiner boxes;
  - o PCUs;
  - 33kV circuit breaker kiosk;
  - Operation and maintenance buildings; and
  - MET stations.
- Commissioning and testing of all equipment on site

An overall construction duration period has been approximated at 12 months. The majority of the construction activities that can generate adverse temporary effects from noise, dust and traffic are likely to be completed within 20 weeks of commencement. The remaining construction time is likely to consist of commissioning and testing of the equipment on site to verify the performance of the solar farm in-line with the requirements of Transpower who will mandate the performance standards that this solar farm must meet. Commissioning and testing activities will have negligible effects on the environment.

### **Construction Access**

The site access during construction will be the use of two points of access onto Cornwall Road:

- 51 Cornwall Road; and
- 107 Cornwall Road.

These two access points are to be used as a one way circulation for construction vehicles. The design of the crossings has been assessed by East Cape Consulting (ECC) who produced the Transportation Assessment Report (TAR).

### 107 Cornwall Road

No upgrades are required to the existing vehicle crossing.



Unsealed shoulder widening (approximately 45m long and 4.5m wide) has been constructed opposite the existing access provides an overrun area to enable large vehicles to turn to/from the access in one manoeuvre.

#### 51 Cornwall Road

This is an existing farm access and construction vehicles will exit onto Cornwall Road via this access, Refer to **Figure 21**. The tracking curves shown in the drawings appended to the TAR show that no upgrades are required. A meeting was held with CDC Operations Manager and Engineer and they are aware of the proposed use of the access which crosses the Taratahi Water Race.

The combination of operational traffic movements and passing traffic on Cornwall Road does not warrant any widening, other than what is already provided.

The conclusion made in the TAR is that given the low traffic volumes on Cornwall Road it is appropriate that vehicles be allowed to sweep across the full width of the road

Figure 20: Existing vehicle access at 107 Cornwall Road. 19m semi-trailer tracking. Showing vehicle entering the site and exiting truck waiting 15m back in the access. Source: ECC, Transportation Assessment Report (TAR), April 2024.



Figure 21: Existing vehicle access at 51 Cornwall Road. 19m semi-trailer tracking showing vehicle exiting the site. Source: ECC, Transportation Assessment Report (TAR), April 2024.



#### **Construction Traffic**

The site traffic during the construction activities is expected to be 112 vpd. The rationale and assumptions informing this number are set out in the Transportation Assessment Report (TAR), and summarised below:

- During the construction phase, the peak number of people on site would be 100 per day,
- An average of 2 workers per vehicle is assumed,
- Up to eleven (11) heavy vehicles (semi-trailer) can be anticipated per day,
- The largest type of vehicle expected on site would be a 19m semi-trailer,
- No over-dimension or oversized vehicles are anticipated, and
- The duration of the site preparation works and construction activities is 20 weeks.

The preparation and adherence of a Construction Traffic Management Plan (CTMP) is the most effective method to manage traffic effects associated with construction. The applicant offers up in the draft conditions whereby a Draft CTMP is prepared and submitted to CDC for approval. Refer to **Appendix 11** for the Draft Conditions.

#### **Construction** Noise

Rule 21.1.13 (c) of the Operative District Plan provides the construction noise limits and refers to the New Zealand Standard NZS 6803: 1999 Acoustics Construction Noise to assess, manage, and control construction noise.

Marshall Day Acoustic engineers have assessed the construction activities against the District Plan noise standards at the nearest sensitive receptors beyond the site. Refer to **Appendix 6** for the Marshall Day acoustic report.

The authors of the Marshall Day report have used the general equipment set out in **Table 1** for the purposes of their construction noise assessment and note that the list may not be exhaustive but illustrates the typical

high noise equipment that may be utilised in constructing the solar farm.

 Table 1:
 Plant sound power level and compliance distances with no mitigation. Source: Marshall Day

 Acoustics, Solar Farm – Masterton Report, Table 3, dated April 2024

Equipment	Typical Operating Sound Power (dB L <sub>wA</sub> )	Noise Level (dB $L_{Aeq}$ ) at a distance (m)			Setback distance to comply with	
		20	40	80	160	75 dB L <sub>Aeq</sub>
Small impact piling rig	123	92	85	77	70	100
Directional drilling	105	74	67	59	52	18
Excavator (30T)	105	74	67	59	52	18
Small screw piling rig	103	72	65	57	50	14
Loader	103	72	65	57	50	14
Excavator (20T)	103	72	65	57	50	14
Concrete truck and pump	103	72	65	57	50	14
Mobile Crane (200T) operating	102	71	64	56	49	13

The closest receiver to the solar farm is 4022 State Highway 2 (Ballance Agri-Nutrients) who is approximately 250m from the closest solar panels. All other receivers are further away.

Based on this, we predict that all construction works can readily comply with the noise limits considered appropriate as set out New Zealand Standard NZS 6803: 1999 Acoustics Construction Noise.

In terms of effects from vibration during construction activities, Marshall Day have used the German Standard DIN 41503:2016 "Vibrations in buildings – Part 3: Effects on structures" and assess three different thresholds.

- cosmetic damage commercial
- cosmetic damage residential
- amenity

The assessment shows that the distance required from the use of an impact piling machine, the distance from a sensitive receiver, to avoid adverse effects on amenity is 25m. This can be achieved as the minimum distance from the proposed solar farm and nearest building is 250m. To that end, Marshall Day concludes there are no concerns with compliance with DIN 4150 during impact piling and levels of vibration would not adversely affect their amenity.

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### Earthworks

The construction activities include earthworks to prepare and construct the following:

- site accesses to the appropriate standard;
- internal roads;
- trenching for buried cables;
- building up any platform areas to locate the PCUs;
- temporary construction laydown areas; and
- prepare the site compound area.

The total volume of earthworks is estimated as 2,700m<sup>3</sup>, based on the concept site plan. The detailed design of the solar farm may change the internal layout and length of roads, and therefore change the overall area of earthworks. Land use consent under the Natural Resources Plan (NRP) is required and is applied to Greater Wellington Regional Council concurrently with this application.

The proposed earthworks are 'light' insofar as the works involving scraping topsoil to create base level for the activities listed above. There is no land recontouring required across the site to enable the solar farm array to be installed, as the single axis trackers are positioned and respond to changes in grades of undulating land.

The underground cabling will be buried in trenches. The exact dimensions of the trenches will be determined during the detailed design phase and will vary depending on the number of cables being buried in a single trench and the amount of power being transferred through the cables.

An indicative cable trench design cross-section for the DC and AC networks is shown in **Figures 22** and **23**, and the maximum depth of a trench is unlikely to exceed **1.6**m. The trenching for cable installation will not change the overall contour of the land and the fill of the trenches can be designed and selected to allow the overland drainage to continue.



### Figure 22: Cross Section of a Typical DC trench. Source: Masterton Solar Farm Ltd



#### Figure 23: Cross Section of a Typical AC trench. Source: Masterton Solar Farm Ltd

Any topsoil removed from the areas will be either be used in the landscaping or stockpiled on site and vegetated. The height of these stockpiles will not exceed 4m, with appropriately graded batters to ensure stability and positioned so that they are clear of any overland flow paths.

No matter the area or volume of earth disturbed on site, all cut and fill shall be balanced on site and there will be no earth or topsoil taken off site. There will be no imported cleanfill (inert earth and topsoil) to the site. The only type of material imported to site, will be the base course layers and engineered fill for the road, site compound, and concrete plinths for the PCUs.

### Draft Construction Management Plan

The construction design details, staging and construction scheduling are to be confirmed once detailed design is completed and contractors have been appointed. To that end, draft conditions of consent are offered in this application and include a requirement for a draft Construction Management Plan (CMP) to be submitted to CDC. Within this CMP, topic areas that will be covered include:

- Confirm compliance with NZECP34;
- Confirm construction activities, staging and scheduling;
- Detailed design of the construction site access onto Cornwall Road;
- Location of temporary laydown areas;
- Location and treatment of topsoil stockpiles;
- Location and use of erosion and sediment controls;
- Dust management, particularly during summer months;
- Hours of operation;
- Adherence with the New Zealand Standard NZS 6803:1999 "Acoustics Construction Noise";
- Accidental discovery protocol key contacts, processes and procedures to follow;
- Community complaints procedure and contacts;
- Contractor information, role and responsibilities; and a

In addition, a Construction Traffic Management Plan (CTMP) is to be prepared and be part of the larger CMP document.

# 4. STATUTORY CONSIDERATIONS

Section 88 of the RMA allows any person to make a resource consent application, provided it is in the prescribed form and includes, in accordance with Schedule 4, an assessment of environmental effects in such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

Schedule 4 of the Act lists those matters that must be included in an assessment of environmental effects, as well those matters that should be considered. These matters are referenced throughout the body of this report confirming that the application meets all the requirements of Section 88.

In accordance with Section 104B of the RMA, when considering a discretionary activity, a consent authority may grant or refuse the application and if it grants the application, may impose conditions under section 108.

Section 104 of the RMA requires (subject to Part II of the Act) a consent authority to have regard to the matters in section 104 when considering resource consent applications. Those parts of section 104 that are relevant are set out below:

- a) Any actual and potential effects on the environment of allowing the activity; and
- ab) Any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and
- b) Any relevant provisions of:
  - i) a national environmental standard:
  - ii) other regulations:
  - iii) a national policy statement:
  - iv) a New Zealand coastal policy statement:
  - v) a regional policy statement or proposed regional policy statement:
  - vi) a plan or proposed plan; and
- c) Any other matter the consent authority considers relevant and reasonably necessary to determine the application.

An assessment of the activities actual or potential effects in terms of Section 104(1)(a) is undertaken in Section 7 of this report, the conclusions of which are considered in relation to notification in Section 8. The relevant provisions of the Combined Wairarapa District Plan (Operative and Proposed) are considered in Section 9.

Part 2 of the Act contains Sections 5, 6, 7 and 8. Section 5 outlines the purpose of the Act, which is to "promote the sustainable management of natural and physical resources", and the meaning of the "sustainable management". Sections 6 and 7 contain "matters of national importance" and "other matters", while Section 8 provides for the principles of the Treaty of Waitangi.

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# 5. PLANNING DOCUMENTS

The proposal is subject to the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) and the Carterton District Plan.

### 5.1 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

The "National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS)" applies to the following activities where they are undertaken on land on which an activity or industry included on the "Hazardous Activities or Industries List" (HAIL) has been, is or is more likely than not to have been undertaken;

- The removal of underground fuel storage system and associated soil
- Soil sampling
- Soil disturbance
- Subdivision of land
- Change in land use

Regulation 6(1) Methods, prescribes the only two methods that may be used for establishing whether or not an area is 'a piece of land' that is subject to the National Environmental Standard (NES):

6(2) By using the most up to date information about the area where the piece of land is located that the territorial authority holds on its dangerous goods files, property files or resource consent database or relevant registers or which it has available from the regional council.

6(3) By relying on the report of a Preliminary Site Investigation (**PSI**) stating that an activity on the HAIL is or is not/has or has not/been or is being undertaken on the piece of land or stating the likelihood of a HAIL being or been undertaken on the piece of land.

The applicant sought a Preliminary Site Investigation (PSI) from EAM to clarify whether the site is 'a piece of land' subject to the NESCS. EAM carried out a detailed site history to review the historical land use at the site and carried out a site visit on 20<sup>th</sup> May 2023. Based the analysis, EAM conclude:

- Available aerial imagery suggests that the site has been farmland since at least 1941.
- The current owner has utilised the property for beef and dairy grazing since the 1980's. Prior to current ownership of the property, it was understood to be pastoral grazing.
- The herbicide MCPA has been used on the property to control weed growth of thistles, fat hen and other unwanted species. This herbicide is not considered to be persistent in soil environments.
- The property has been cultivated and re-grassed/cropped as required, and tillage of soils would assist in reduction of any residual sprays, and cadmium-based fertilisers within the soil environment. Based on the information gathered in this investigation, there are no potential contaminants of concern which have been identified within this site.

The area of the site proposed for development has not been exposed to HAIL activities.

Overall, EAM considered it highly unlikely that there will be a risk to human health during and following the proposed solar farm activity from previous land use activities. To that end, the site is not a piece of land subject

to the NESCS.



### 5.2 National Environmental Standard for Freshwater

The "National Environmental Standards for Freshwater" (NESFW) applies to activities involving identified natural inland wetlands, reclamation of rivers and culverts in rivers and connected areas. The proposed solar farm does not include activities that require consideration under the NES-FW.

### 5.3 National Environmental Standard for Electricity Transmission Activities

The "National Environmental Standards for Electricity Transmission Activities" (NESETA) applies to activities involving the operation, maintenance, upgrading, relocation or removal of an existing transmission line. The NESETA may be applicable to subsequent activities involving the existing Powerco local electricity distribution lines that the proposed solar farm will connect to. Any structures or cabling from the site to the Powerco infrastructure shall be provided for once the detail design process has been completed and any additional consent requirements under the NESETA would be confirmed at this stage.

# 5.4 Combined Wairarapa District Plan (Operative District Plan) and Activity Status

### 5.4.1 Operative District Plan

The site is within the Special Rural Zone.

The following overlays and planning notations applying in varying ways across the site:

- Transpower's National transmission line corridor traverses the site in diagonal from south to north-west.
- Flood Hazard Area associated with the Waingawa River
- Airport approach path crosses over the existing access to be used at 107 Cornwall Road

Consent Requirements:

District-Wide Rules (Section 21)

- 1. Discretionary activity for a new renewable energy generation activity under Rule 21.6(a).
- 2. Restricted Discretionary Activity for earthworks and non-habitable structures within the Flood Hazard Area under Rule 21.4.7

Rural Zone

- 3. Restricted Discretionary activity under Rule 4.5.5(c) for an activity that is not primary production or residential purposes where buildings of greater than 25m<sup>2</sup> in gross floor area are proposed. It is understood that this rule applies as the interpretation is that while the tracking system and solar panels do not have a 'floor area', they still meet the definition of 'building' and in total, are greater in area than 25m<sup>2</sup>.
- Restricted Discretionary activity under Rule 4.5.5(e) where the on-site carparking and access designs do not comply with the standards set out in Appendix 5.

### 5.4.2 Proposed District Plan (PDP)

The site is within the General Rural Zone.

The following overlays and planning notations applying in varying ways across the site:

- Transpower's National transmission line 110kV corridor traverses the site in diagonal from south to north-west.
- Flood Hazard Areas (High, Moderate and Low) associated with the Waingawa River
- Airport approach path crosses over the existing access to be used at 107 Cornwall Road

The rules pertaining to the General Rural Zone, Natural Hazards, and Energy have been checked. The proposed activities do not trigger any aspects of the rules that have been given immediate legal effect, so no resource consents are required under the PDP.

### 5.4.3 Overall Activity Status

Overall, the application is to be assessed as a **Discretionary Activity** under Rules Rule 21.6(a), 21.4.7, 4.5.5(c) and 4.5.5(e) of the Operative District Plan.

# 6. CONSULTATION

In accordance with Schedule 4 of the RMA, an application for resource consent should:

- 1. Identify the persons affected by the proposal.
- 2. The consultation undertaken.
- 3. Any response to the views of any person consulted.

To avoid doubt, while the applicant is not obliged to undertake consultation, nor is there any grounds for expecting the applicant to consult with any person, the applicant is obliged to report on who may be affected by the proposal. This is expanded upon in the body of this report.

### Council Staff

Early discussions with Carterton District Council planning officers on 2<sup>nd</sup> February 2023 confirmed the understanding of the rule assessments and overall approach to effects assessments and consultation. Correspondence has continued over the year on various rule understandings.

#### Mana whenua

Rangitāne o Wairarapa and Ngāti Kahungunu ki Wairarapa were contacted, via email on 15<sup>th</sup> August 2023, with an invite to engage with the applicant and planning consultant on the proposed solar farm. This invitation was forwarded to Darrin Apanui at Rangitāne Tu Mai Ra Trust. Further information was sent to Darrin regarding the applicant and their background on solar farm developments.

In the new year, we were given permission to follow up the Taiao unit at Rangitāne o Wairarapa and had a meeting with  $\frac{5}{12}$  and  $\frac{5}{2}$  (2)(a) in February 2024 to explain the draft proposal to them. They gave us some high level considerations and a response to these was sent back on the 12<sup>th</sup> March 2024, along with an explanation that the resource consent application would be submitted to CDC in mid-April. A copy of the final application has been sent directly to  $\frac{5}{2}$  (2)(a) at Rangitāne o Wairarapa.

Several attempts have been made to engage with  $\frac{57(2)(a)}{2}$ , including emails, phone calls and we arranged a face-to-face meeting on the 8<sup>th</sup> of February. Unfortunately,  $\frac{57(2)(a)}{2}$  was unable to attend the February meeting. The most recent correspondence was an email sent from Claire Price to  $\frac{57(2)(a)}{2}$  on the 12<sup>th</sup> of March, with update information on the project and our timeframe for lodgement was shared.

### **Owners and occupiers of Adjacent Properties**

The assessments provided in Section 7 of this application consider that effects on owners and occupiers at adjacent properties arising from the proposed activities are less than minor and therefore no party considered to be adversely affected. Consequently, no formal consultation has been carried out with neighbouring properties.

# 7. ASSESSMENT OF ENVIRONMENTAL EFFECTS

### 7.1 Relevant Assessment Criteria

The following assessment of environmental effects is structured to consider the relevant matters from the assessment criteria from the District Plan under provisions:

	Assessment Criteria / Matters of Discretion					
	Summary of effects assessed					
7.2	Provision 22.1.20 provides assessments matters for a new wind energy facility and the matters of					
	discretion set out in 4.5.5(c) with respect to buildings greater than 25m <sup>2</sup> gross floor area have					
	been used to develop the list of effects of the proposed solar farm, a new renewable energy					
	activity. This list also includes matters related to vehicle access and parking which require consent					
	under Rule 4.5.5(e) and include:					
	Positive effects					
	<ul> <li>Rural character and amenity</li> </ul>					
	Glint and Glare effects					
	Transportation effects					
	Ecological effects					
	Cultural and heritage					
	Construction effects					
7.3	Flood Hazard Area					
	a) The matters of discretion is restricted to those matters set out under Rule 21.4.7:					
	(i) The effects of the activity on the likelihood of flooding and/or erosion, or increase					
	in its magnitude, including to other properties.					
	(ii) Risks to people and property.					
	(iii) Mitigation measures to manage the risks from flooding or erosion.					

### 7.2 Assessment Matters for a new renewable electricity generation activity

#### Positive effects

The New Zealand Government has committed to achieving net zero carbon emissions by 2050 and set a target that 50% of total energy consumption will come from renewable sources by 2035. The government also has an aspirational target of 100% renewable electricity generation by 2030<sup>2</sup>. The proposed solar farm has the capacity to generate circa 12.5MW(AC) of electricity, which is equivalent to supplying 4,000 households.

The proposed solar farm supplies the national level electricity network without requiring any upgrades to the existing substation or grid. The additional supply is a direct benefit at a national level. Once the electricity is conveyed to the National Grid, the electricity generated at the proposed site could be used anywhere throughout New Zealand.

The applicant intends to offer opportunities for employment, training and educational activities as part of the construction, operation and maintenance of the proposed solar farm – which will have direct benefits to the local community.

#### Effects on rural character and amenity

The Rural Zone objective 4.3.1 and policy 4.3.2 of the Operative District Plan are relevant to understanding the expectation of rural character and amenity of the site and its locality. In addition to the information provided in the District Plan, this application is supported by technical reports on landscape and visual (Wayfinder), glint and glare (Aurecon) and acoustic (Marshall Day) which collectively build a picture of the rural character and amenity values of the site and surrounds and set out how the design of solar farm avoids, remedies and mitigates actual and potential adverse effects on these values.

#### Landscape Values

The experience driving through the landscape is of an eclectic mix of housing, industry and farming. The Tararua Ranges are a consistent backdrop looking to the west with the open lowland basin to the east. Powerlines are frequently seen across the landscape, along roads and through paddocks. Commuters, rural machinery operators, recreation seekers and industrial stock movements create a constant traffic flow along State Highway 2 (SH2).

The following points are made in relation to the landscape values of the site:

- The site and surrounds have generally low biophysical value due to the modified productive nature. There is likely to be some biophysical value along the Waingawa River to the north of the proposal, however it mostly consists of exotic advantageous vegetation and sparce riparian habitat.
- A moderate level of modification exists along the Waingawa River in the form of vegetative flood control measures which somewhat reduce the natural values - due in part to the close proximity to Masterton along with the visible activities of gravel extraction being seen from the SH2 bridge north of the proposed site.
- The perceptual qualities of the area include a sheltered, semi-industrial, productive rural character.
- The semi-industrial character is reinforced by the busy traffic seen moving along SH2 and transitioning

<sup>&</sup>lt;sup>2</sup> Consenting improvements for renewable electricity generation and transmission | Ministry of Business, Innovation & Employment (mbie.govt.nz)

through the Waingawa Industrial area which sits to the south of Masterton. Multiple and eclectic buildings as well as a mixture of farming activities are scattered across the landscape.

- The perception of productivity is reinforced through the range of noises permeating the air, often on
  a cyclic and seasonal basis, from the production, manufacture, processing and/or transportation of
  raw materials derived from primary production and ancillary activities.
- There is likely to be cultural values associated with the Waingawa River, and **10** S 1(2)(d) made the comment that the river terraces were often part of the walking tracks used by Māori going from the ranges to the coast. There are no recorded archaeological sites at the site or surrounds.
- The site and surrounds have no outstanding natural landscapes, outstanding natural features, significant natural areas and there are no recorded archaeological sites at the site or surrounds.

### Landscape Effects

The key points made on landscape effects in the Landscape and Visual Assessment (LVA) are as follows:

- The proposal will result in a change in landscape character by introducing a reasonably large amount of built form, resulting in a unique element in the wider rural landscape. Yet, the effect of the solar farm is not adverse because the wider landscape is already modified with a mixture of housing, industry and farming. Vegetation across the plains is mostly exotic in the form of pasture and exotic shelterbelts. Landforms are largely modified including rivers which are flanked by exotic flood control vegetation. Built forms in the area include farm associated buildings, industrial warehouses and factories, lifestyle, farming, and residential houses as well as the adjacent Transpower substation with numerous overhead lines.
- Ancillary buildings will be relatively insignificant to the whole development, their small size is in character with both the wider rural character.
- The proposed perimeter deer fencing will have a generally rural character.
- The level of screening provided by the existing hedgerows provides a sufficient level of mitigation, without completely hiding the activity away.
- The short gaps in hedgerows would enable a glimpse of the proposed solar farm and give an understanding of the activity and its operation.

The proposed solar farm will have a built form that is different to the pastoral character of the site, yet very difficult to see from beyond the site, as it is confined by the surrounding topography and shelter belts. The surrounding area is a productive, semi-industrial landscape that has been highly modified and the proposed solar farm will be a new and complementary activity to the amenity of the wider environment.

Overall, the actual and potential adverse effects on landscape values of the site and surrounds are considered to be less than minor.

The LVA includes an assessment of the actual and potential visual effects of the proposed solar farm on owners and occupiers at adjacent properties. Refer to the sensitive receptors map shown in **Figure 14**. In summary, the assessment (Refer to page 12 - 15 of the LVA) demonstrates that each adjacent property, including residential, industrial and rural properties, will receive less than minor adverse visual effects. The rationale is based on varying responses of each adjacent property to the following considerations:

- Distance, relative elevation of land of the adjacent property from the extent of the solar farm;
- Orientation and outlook from existing houses, industrial or rural activities;
- Degree of screening provided by the existing shelterbelts or vegetation, within the subject site; and Natural and physical barriers that screen the site from adjacent properties, such as SH2, the Waingawa



LVA discusses three key public viewpoints of the proposed solar farm and these are located on the immediate surrounding road network and include:

- Approximately 0.5km north of the Cornwall/SH2 intersection
- Approximately 0.7km south of the Cornwall/SH2 intersection
- Approximately 0.8km east along Hughes line, just before access to the river

None of the above vantage points enable the proposed solar farm to be viewed in its entirety. Instead, only a narrow section of the extent can be seen, and of that, only the first few rows of the panels. Wayfinder state

"For most vehicle trips, the solar farm will be a small part of an extended experience through the wider landscape."

And make the following conclusions:

"Full screening of the proposal was not considered necessary, the level of landscape effects was considered acceptable. The existing mature shelterbelts will provide initial screening of the site and over time it will become part of the wider productive landscape."

"It is therefore considered that from a public viewing experience, visual effects will be low. The proposal is not located in any significant views or viewshafts and will be generally seen as part of a wider transient experience across the landscape."

The proposed landscape mitigation is set out in Section 3 of this application and is to retain the existing hedgerows within the site. No further landscape mitigation is required.

Based on the assessment and conclusions from Wayfinder, and with the existing hedgerows retained, the actual and potential landscape and visual effects on the environment and adjacent properties, are considered to be less than minor.

### Noise Effects

The Marshall Day acoustic assessment concludes that noise generated by the solar farm, in particular the power conversion units (PCU), can comply with the Rural Zone noise limits. Marshall Day considers the application of the night time noise limits is an appropriate method of understanding the noise effects because PCU's sometimes operate outside the daytime noise limits (0700-1900), i.e. late summer etc. Compliance with the night-time noise limit sets a reasonable level of noise for this environment. In addition, the site operates in an environment which has a variety of activities contributing to the ambient background noise, including rural industry, SH2, and the Waingawa Industrial Area, and the Masterton substation. Overall, the actual and potential adverse effects from noise generated from the solar farm are considered to be less than minor on the environment and at adjacent properties.

### Conclusion on rural amenity

The proposed solar farm will bring a new type of built form to the site yet is largely screened due to topography or existing hedgerows and will be complementary to the wider environment which supports a range of primary production, industrial and other activities. The noise generated from the PCUs will achieve nighttime noise levels at the closest residential dwelling, and this is a reasonable level of noise to anticipate in the rural environment.



### Glint and Glare effects

An assessment has been prepared to evaluate the actual and potential risk (including associated effects) of glare, a bright light that can affect vision or cause discomfort or damage to the viewer's eyes, and glint which can be defined as a momentary flash of light that can cause annoyance or distraction.

An explanation of the geometric analysis is provided in the Aurecon Glint and Glare assessment, explaining when 'glare' can occur, and when it is considered to be significant. In summary, glare (or reflection) from the solar panels has the potential to generate adverse effects when the solar panel is near horizontal, and the sun is low. There are certain angles where glare can be more directive towards adjoining land uses. Trigonometry is used to calculate the height at which the potential glare would (worst-case) reach the observer or pass above the observer.

The scope of this glare assessment includes the roads and dwellings within approximately one kilometre of the solar farm, as depicted on the sensitive receptors drawing in **Figure 14**, which include:

#### Roads:

- Hughes Line in northeast-southwest direction to the south of the Site area
- Cornwall Road in northwest-southeast direction to the west of the Site area
- Norfolk Road in northwest-southeast direction to the northwest of the Site area
- State Highway 2 in northeast-southwest direction to the northwest of the Site area
- Solway Crescent Road
   – in northwest-southeast direction to the northeast of the Site area

#### Rural residential dwellings:

• 573, 577 and 580 Hughes Line (3 dwellings)

And also, the two flight paths at the airstrip of Hood Aerodrome just over 1km southeast of the Site (refer to Figure 24 below).

The conclusions from the assessment are that for all roads and adjacent properties to the solar farm scored a glare impact of 'none', refer to **Table 2** below. This score means:

reflected light passes so far overhead there will be no direct or indirect glare, and/or the viewer is at the wrong orientation relative to the solar farm to be exposed to glare effects.

### Table 2: Glare height for nearby observers. Source: Aurecon, Masterton Solar Farm, Table 3-1.

Receptor	Direction relative to solar farm	Approx height of glare <u>above</u> receptor [m]	Glare impact
A - 573 Hughes Line	South	n/a	None
C - 577 Hughes Line	South	n/a	None
D - 580 Hughes Line	South	n/a	None
Hughes Line	Southwest	73	None
Cornwall Road	West	33	None
Norfolk Road	Northwest	67	None
State Highway 2	Northwest	44	None
Solway Crescent	Northeast	103	None

To that end, the actual and potential adverse glint and glare effects on roads and adjacent properties are considered to be less than minor - negligible.

### Hood Aerodrome Flight Paths

GlareGauge is based on the Solar Glare Hazard Assessment Tool (SGHAT) that was developed by Sandia National Laboratories and commercialised by Forge Solar. The tool was developed in conjunction with the USA Federal Aviation Administration to assess effects on pilots during final approach and air traffic controllers. It enables quantitative assessment of likelihood for potential glare effects on the human eye based on receptor location and PV array information and establishes the time of day and year that glare risks are expected to occur. GlareGauge has only been used for the assessment of effects for the flight paths.

For the GlareGauge modelling Aurecon has used the inputs and assumptions outlined in Section 1.3.2 of their report (refer to **Appendix 9**). The flight paths are shown with the proposed solar array area in **Figure 24**. Trees on the northeast border of the proposed solar farm have been included in the model as an "obstruction" which blocks glare, with an assumed height of 5 m.

Figure 24:Hood Aerodrome, Flight Paths FP1 (NE) and FP2 (SW). Riverbank Trees are shown by orange.<br/>Source: Aurecon Masterton Solar Farm, Glare Assessment, Ref 524023, page 10.



The results are provided in terms of three levels of glare hazard:

- Green Low Potential Hazard: Low potential for a temporary after-image (a lingering image of the glare in the field of view).
- Yellow Moderate Potential Hazard: Potential to leave a temporary after-image of the glare.
- Red High Potential Hazard: Potential for permanent eye damage if observed.

The glare analysis for the two flight paths shows the following:

Flight Path 1 (FP1)

• Some "green" glare is predicted for the flight approach path to the northeast of the airstrip (FP1) during late-Feb to late-March and early-September to early-October (approximately two months total), for periods of up to 4 minutes between approximately 6pm to 7pm.

Flight Path 2 (FP2)

• Some "green" and "yellow" glare for the approach path to the southwest of the airstrip (FP2) between May and early August (approximately three months), for periods of up to about 10 minutes per day at times between approximately 7am and 8:15am.

Aurecon consider the adverse effects from the predicted glare for both flight paths are less than minor on the aerodrome and its users, and no mitigation is required because:

- The glare intensity is relatively low ("green" and very low "yellow" hazard level)
- FP1 has "Green" glare, which has a low intensity, and for a predicted short amount of time.
- The "yellow" glare occurs at the farthest distance from the runway, on the approach path for FP2. The impact of yellow glare is relatively low, and less important further away from the runway.
- The actual approach paths are likely to be shorter than 2-miles, as this distance is the assumed length based on large international flights which do not occur at Hood Aerodrome.
- The amount of time throughout the year glare is predicted to occur is also very low (less than 10 minutes per day, only 5 months a year and 16.4 hours per year for all potential glare combined)
- The amount of glare impact will be reduced by considering cloud cover (glare cannot occur when the sun is blocked by clouds). The estimated cloud cover at the site is 50% of the time, based on NIWA sunshine hours data from the nearby Masterton EWS weather station – this would reduce the total amount of glare to 8.2 hours per year.
- The effects from glare can be easily avoided by scheduling flights at times that glare will not occur, or using the opposite approach direction to the one for which glare is predicted.
- If aerodrome users choose to fly at times when glare may occur, glare effects can be reduced by the use of sunglasses.
- Aurecon explain in their methodology that GlareGauge is known to over-predict glare i.e. the modelled results are a worst-case scenario.

To conclude, the glint and glare analysis demonstrates that the proposed solar farm will have less than minor effects on the environment and those at adjacent properties, including the Hood Aerodrome.

### **Operational Traffic Effects**

The proposed use of existing access from Cornwall Road once the solar farm is operational has been assessed by ECC, who are satisfied that the current design and surfacing will meet the requirements of the proposed traffic and usage from both the existing activities and the 10 vehicle movements per day that would be



generated by the solar farm.

As a precaution, a recommendation in the TAR is that signage be installed to remind drivers exiting Cornwall Road to watch for vehicles entering the site. Based on the assessment provided in the TAR, it is considered that the generation of traffic onto Cornwall Road and the wider road network is minimal and will not adversely affect the safety or efficiency of the road network.

### Ecological effects

The ecological values on the site are described in Section 2 of this application and supported by the Ecological Values assessment by Dr Adam Forbes. To recap, there are no natural inland wetlands indicated by vegetation, soils, or hydrology on the site, and the former drainage channels are at best classed as ephemeral and do not meet the definition of 'river' in the RMA. There are no other ecological values on the site and no adverse effects to be considered.

### Cultural and Heritage

To date, the engagement with Rangitāne and Kahungunu has not raised risk areas for the site in terms of wahi tapu or other culturally significant sites.

The area of the proposed solar farm is not identified as being near any recorded archaeological sites (ArcGIS) or listed historic heritage features in the District Plan.

As part of the draft Construction Management Plan, inclusion of an accidental discovery protocol will be required so that if any archaeology is uncovered there is a correct policy and procedure (involving mana whenua) for contractors to follow.

There will be no adverse effects on the Waingawa River, during construction or the operation of the solar farm.

To that end, the actual and potential adverse effects on cultural values are considered to be less than minor.

### **Construction Effects**

### Construction Noise

The acoustic assessment by Marshall Day demonstrates that compliance with *NZS6803:1999 Construction Noise* can be achieved during the construction activities at the site. The preparation of a draft Construction Management Plan will detail the construction methodology and demonstrate how compliance will be achieved and monitored.

The actual and potential adverse effects from construction noise can be managed and will be less than minor on the environment and on those at adjacent properties.

### Construction Traffic Effects

The assessment of construction effects is provided in Section 5.2 of the Transportation Assessment Report (TAR) where it is concluded:

• the construction traffic is estimated to be 112 vehicles per day (during peak workforce) with construction workers (two per vehicle) carpooling to / from the site, and expected peak heavy vehicle

volume of six (6) heavy vehicles entering and exiting the site per day.

- A morning peak arrival period and an evening peak departure period will be generated to and from SH2 via Cornwall Road.
- Cornwall Road is currently carrying a low volume of no more than 400 vpd which is well within the carrying capacity of a two-way two-lane rural road. The addition of 112 vpd is not expected to generate any operational or safety related issues.
- The SH2/Norfolk Road/Cornwall Road roundabout is expected to be fully operational by the time the
  proposed solar farm is generating construction movements. This upgrade addresses existing safety
  issues at the intersection and provides more capacity, particularly for sideroad movements. On this
  basis, the intersection is expected to have ample capacity to accommodate construction traffic
  movements generated by the site.

The construction traffic generated by the proposed activity is to be managed by way of a Construction Traffic Management Plan (CTMP) and avoid, remedy mitigate adverse effects on the movement of vehicles to and from Cornwall Road. This CTMP will be subject to approval by Council and is the appropriate mechanism to manage construction related effects.

The actual and potential adverse effects from construction traffic can be managed and will be less than minor on the environment and on those at adjacent properties.

### 7.3 Assessment Matters for Flood Hazard Area

The matters of discretion is restricted to those matters set out under Rule 21.4.7:

- The effects of the activity on the likelihood of flooding and/or erosion, or increase in its magnitude, including to other properties.
- *Risks to people and property.*
- Mitigation measures to manage the risks from flooding or erosion.

The Operative District Plan Flood Hazard Area extends over the extent of the proposed solar farm. The Proposed District Plan flood hazard overlay is applied in a more targeted way and areas of 'high', medium' and 'low' flood hazard risk are identified.

The extent of the solar farm avoids the 'high' risk flood area which applies to the Waingawa River corridor and esplanade area, as identified on the Proposed District Plan maps. The remaining area of the site has low hazard (inundation areas) and medium hazard (overflow areas).

The Preliminary Civil Engineering Report by CF Projects refers to "current flood models", which corelate to those in the Proposed District Plan, and based upon a 1% AEP flood event and climate change.

The predicted flood water would enter the site from the north-west, and while there are no permanent flowing streams or overland flow paths present, the site is traversed with shallow depressions and channels which direct overland flow from the northwestern boundary towards the southeastern boundary. LiDAR elevation data shows these shallow depressions and channels are typically 300mm – 500mm lower than the surrounding land, with a typical width between 10 and 20 metres.

The predicted flood water is shown to concentrate around the existing overland flow paths and depressions,



with depts between 500mm and 1000mm, and these areas are generally close to the river corridor, rather than across the entire solar farm extent area.

Draft flood models show a larger portion of the site impacted by flood extents. Yet, CF Project comment that the flood depths and effects of the predicted flood water are generally consistent with the current plans.

The tracking systems, which support and tilt the solar panels, are on steel piles driven as deep into the ground as necessary to withstand wind loads and other environmental requirements and are to be determined at detailed design stage. The steel pile support structures and tracking systems have sufficient height clearance to allow flood water of 500mm to 900mm depth to pass through and under the solar panels. Yet, to enable a greater depth of flood water to pass under, a specific foundation design can be applied.

The PCUs are to be positioned in locations where there is either no predicted flood water, or if this cannot be achieved, positioned on earth bunds providing 500mm freeboard above the modelled flood depths. Any earth bunds will not be located in overland flow paths.

The earthworks involved with trenching and installing cable infrastructure associated with the solar farm, will be designed to maintain the existing contours.

The proposed internal road layout is conceptual and subject to some changes through the detailed design process. The concept road layout avoids the overland flow areas and cuts across the low risk inundation areas. The road design in the low inundation areas will be designed to avoid being an obstruction to the flood water and redirecting elsewhere and potentially worsening flood hazard effects on people and property to the east. CF Projects conclude that by maintaining existing site levels through identified overland flow paths will ensure that impacts on neighbouring properties and flood levels are appropriately mitigated.

The north-western extent of the solar farm has an established hedgerow, with established branches from the base to the top. This hedgerow is to remain as part of the visual mitigation. The hedgerow also provides protection for the proposed solar farm from potential debris that comes down in flood water.

CF Project conclude, based on the available flood modelling and elevation data, that the proposed development can be undertaken with negligible impact on flood extents and neighbouring properties when completed in consideration with the following recommendations:

- Filling within overland flow paths shall not be undertaken;
- Important infrastructure (such as the PCUs) should will be placed at locations where they will not be impacted by flood extents, if this cannot be achieved, they will be positioned on earth bunds providing 500mm freeboard above the modelled flood depths;
- A further 50 metre buffer from the river corridor is applied to the location of PCUs.
- A detailed design shall be completed detailing heights of all accessways, site compounds and PCU location, care should be taken when converting flood height datums to local co-ordinates. The detailed design should confirm that the location of infrastructure will not impact on the modelled 1% AEP flood event.
- Existing planting on the northwestern boundary is maintained to minimise flood debris entering site where it may collect on the solar mounting/tracking system foundations/piles.
- A detailed design shall be completed detailing heights of all accessways, site compounds and PCU locations, care should be taken when converting flood height datums to local co-ordinates. The detailed design should confirm that the location of infrastructure will not impact on the modelled 1%

AEP flood event.

 A flood hazard management plan may be developed for the site, this may include such measures as monitoring of inclement weather, positioning of panels in optimal orientation during flooding to allow water to pass safely during flood events and maintenance of swales and/or overland flow paths.

Based on the assessment of flood hazard risk, the effects of the proposed solar farm and the measures available to avoid and reduce effects of flooding on the site and not worsen for properties and people nearby, the use of the land within the flood hazard zone is considered appropriate with less than minor adverse effects on the environment and those at adjacent properties.

### 7.4 Highly Productive Land

The consideration of the effects on highly productive land is a requirement to implement the National Policy Statement on Highly Productive Land (NPS HPL). Under the NPS-HPL, HPL is deemed to be land, which is LUC 1, 2 and 3. This is informed by the New Zealand Land Use Capability Survey Handbook and the Land Use Classification of the Wairarapa – Southern Hawkes Bay.

As described in Section 3 of this application, the proposed solar farm has been located and designed to largely avoid areas of land that have LUC 1, 2 and 3. Yet, following logical paddock boundaries and topography, the extent of the solar farm includes 1ha of LUC3s2.

The AgFirst Report authored by Juliette Chambers presents an assessment of the proposed solar farm and the effects on the potential productive capacity of the site. The report is comprehensive and covers the following:

- investigates the land use capability characteristics of the land and the current and potential productive use of the land, subject to the proposed solar farm.
- investigates the barriers to land use change, for example, if not dairy grazing what else could the farm be used for and what are impediments; what is the likelihood of alternative primary productive activities.
- Explains the regulatory context (primarily the Natural Resources Plan and NPS-FW) which impacts decisions on use of the site for other primary productive activities.
- Lastly, the evaluation assesses the effect on the productive capacity from the proposed solar farm, and again after the solar farm is decommissioned and the land remediated.

The conclusions of the productive capacity assessment are as follows:

- The existing farm grazes cattle as a support block for farms in the area and comprises an approximate area of 95ha.
- The area where the solar farm is being proposed takes up 7 paddocks in the middle of the farm, bordering the Waingawa River and close to the Masterton substation and existing distribution powerlines.
- The area contains no vital infrastructure that affects the operation of the farm on the balance of the farm and will utilise a large area of land that is not considered highly productive.
- The majority of the site being over LUC 6 land, and only 1ha being LU3.
- Currently the farm is leased out for cattle grazing and any land use change would require reasonable investment in shelter, irrigation, and infrastructure (all dependent on the land use). Furthermore, the farm would be limited by the soils and climate.
  - The small area of highly productive land that will be utilised by the solar farm will also not compromise

the use of the remaining HPL over the rest of the farm.

- The solar panels enable a dual land use opportunity, enabling sheep to be grazed in conjunction with the solar farm.
- The solar panels will cause some degree of temporary shading over the small area of HPL, which has been assumed to have some impact on the amount of solar radiation on pasture and thus a reduction in pasture production. This assumption is based on the limited research information available. However, the solar panels also increase moisture retention and provision of shade and shelter for sheep which helps to offset this reduction in pasture growth and could in fact result in no effect on animal production and/or have a positive impact on the LUC 6 land.
- The proposed use of part of the farm for solar, will not mean a permanent change to the productive capacity of the land. The solar farm is designed to be decommissioned and removed at the end of the project, estimated 40 years where the farmland will be returned to its previous state.

At a district level the solar farm will have a less than minor effect on the district's productive capacity availability. The Carterton District has 24,665ha of HPL and this is predominately LUC3 land. The installation of the solar farm site would mean an interim loss of 0.004% of HPL. This loss is not entire as sheep will still be grazed in conjunction with the panels.

Mitigation measures during the design of the construction methodology and earthworks, the mixing of sub and topsoil is to be avoided as much as possible and stockpiled separately.

Overall, AgFirst considers that the proposed solar farm will have a less than minor effect on the district's availability of HPL for land based primary production, further the area can be reinstated to its current state once the solar farm is decommissioned.

### 7.5 Reverse sensitivity

The consideration of reverse sensitivity effects takes stock of activities in the vicinity of the proposed solar farm, and whether there could be any operational constraints on these as a result of the proposal.

The balance area of the site will continue to operate as a cattle grazing, and the landowner considers there to be no obstacle in the operation of a solar farm on adjoining blocks of land.

Nearby composting and other rural industrial activities will not be adversely affected by the proposed solar farm.

The proposed solar farm will not generate sensitivity around the existing Masterton substation. Any works or structures in close proximity of the National Grid and the local electricity network will be designed to comply with NZECP34, therefore avoiding adverse reverse sensitivity effects on existing infrastructure. There will be no buildings within the National Grid corridor, as set by the Operative District Plan setback rules.

Overall, the actual and potential adverse reverse sensitivity effects can be avoided through complying with the National Grid corridor and managed with adherence to NZECP34.

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### 7.6 Conclusions on Environmental Effects

Overall, the actual and potential adverse effects of the proposal are considered to be less than minor. The following are key points (from the assessments above) in arriving upon this view:

- The proposed solar farm is an appropriate land use for the site and the actual and potential adverse effects on rural amenity are avoided through the location, scale, extent and external boundary design, and ability to comply with noise limits applicable to the site.
- There are no ecological values on the site and no adverse effects generated by the proposed solar farm.
- The proposed solar farm will not generate adverse effects on recorded archaeological sites or listed historic heritage features.
- The preparation of a draft Construction Management Plan will detail the construction methodology and demonstrate how compliance with NZS6803:1999 Construction Noise can be achieved, implemented and monitored.
- The construction traffic generated by the proposed activity is to be managed by way of a Construction Traffic Management Plan (CTMP) and will ensure that adverse effects on the movement of vehicles to and from Cornwall Road will be minimised.
- From what has been understood to date from Rangitāne o Tamaki nui-ā-Rua, the proposed solar farm is a better land use than the cattle grazing and has a more positive effect on their values rather than a negative one.
- The proposed solar farm will have a less than minor effect on the district's availability of HPL for land based primary production.
- Overall, the actual and potential adverse reverse sensitivity effects can be avoided through management and adherence to the NZECP34.

# 8. NOTIFICATION ASSESSMENT

There is no presumption in the RMA itself as to whether or not an application will be notified, and a consent authority has discretion in determining whether or not notification is necessary. This assessment is primarily governed by Section 95A and Section 95B of the RMA.

### 8.1 Section 95A Assessment – Wider Environmental Effects

Section 95A of the RMA considered the need for public notification and sets out four steps in a specific order to be considered in determining whether to publicly notify.

In terms of Step (1), public notification has not been requested, Section 95C pertaining to notification in the event that further information is not provided under Section 92 is not applicable, and the application is not being made jointly with an application to exchange recreation reserve land under Section 15AA of the Reserves Act 1977.

In terms of Step (2), none of the circumstances precluding notification are applicable.

Moving to Step (3), notification is not required by a rule in a plan or a national environmental standard. Under section 95A(8)(b), a decision is required to be made in accordance with section 95D as to whether the activity

will have, or is likely to have, adverse effects on the environment that are more than minor. Where adverse effects are deemed to be more than minor, public notification is required under Step 3.

As part of this effects assessment, Section 95D(a)(ii) requires that in assessing whether the effects of the proposed activity will be more than minor (for the purpose of public notification) the consent authority must disregard any effects on persons who own or occupy 'adjacent land'. The reason for this is that effects (if any) on those persons are to be assessed under sections 95B and 95E, for the purpose of limited notification. The term 'adjacent' applies to properties nearby the land subject to the application, and any effects on the owners and occupiers of these properties must therefore be disregarded in the public notification assessment.

**Figure 14** is the sensitive receptors map which was generated specifically to consider which properties are to be included as 'adjacent'. Land beyond those properties is considered to be the 'wider environment', in which the assessment of effects in Section 7 of this application demonstrates adverse effects to be less than minor.

Lastly, Step 4 considers whether there are any special circumstances. Our understanding is that a special circumstance is one "outside the common run of things, which is exceptional, abnormal or unusual", and that the purpose of considering special circumstances is to look at matters that are beyond the plan itself. The fact that a proposal might be contrary to the objectives and policies of a plan is probably not sufficient to constitute special circumstances.

Special circumstances must also be more than where a council has had an indication that people want to make submissions and must be more than just the fact that a large, contentious or interesting development is proposed. The fact that some parties have concerns about a proposal does not in itself give rise to special circumstances, nor is it considered that any enforcement proceedings associated with an activity justify special circumstances.

In summary, the proposal is not considered to be characterised by any special circumstances, and on this basis, public notification is not required under any of the pathways in Section 95A.

### 8.2 Section 95B Assessment – Effects on the Local Environment and Particular Parties

While public notification is not necessary, any effects of the proposal on the local environment and upon particular parties must still be considered. This is addressed through Section 95B of the RMA, which has four steps similar to Section 95A.

In terms of Step (1), there are no affected protected customary rights or customary marine title groups in terms of Subclause (2).

In terms of subclause (3), and whether the proposed activity is on or adjacent to, or may affect, land that is the subject of a Statutory Acknowledgement made in accordance with an Act specified in <u>Schedule 11</u>. Further, it is understood that subclause (3) relates to where there is publicly owned land, rather than private land and therefore not relevant to this application.

In terms of Step (2), none of the circumstances in Subsection (5) that would preclude limited notification apply. We therefore move to Step (3).
Having disregarded land adjacent to the subject site for the purposes of Section 95D(a)(ii), that land is now returned to under Step (3) of Section 95B, which requires the consent authority to determine, in accordance with Section 95E, whether there are any affected parties. Section 95E states that a person is an affected person if the consent authority decides that the activity's adverse effects on the person are minor or more than minor (but are not less than minor).

The list of properties adjacent to the site are set out below and also shown in the sensitive receptors map in **Figure 14**, and is repeated here for ease of reference:

- 573 Hughes Line
- 580 Hughes Line
- 577 Hughes Line
- 581 Hughes Line
- 593 Hughes Line
- 113 / 131 Cornwall Road
- 3954A SH 2 Cornwall Road
- 4022 SH2
- 4061 SH2
- 24 Norfolk Road

The assessment undertaken in Section 7 is drawn upon in considering the proposals scale of effects on these owners/occupiers.

 Figure 14:
 Sensitive Receptors Map. The orange numbered circles refer to the photos provided in the LVA. Source: Landscape and Visual Assessment, Wayfinder



Resource Consent Application for Land use 51, 99 and 107 Cornwall Road, Carterton 24023\_App1 | 16<sup>th</sup> April 2024 The actual and potential adverse effects on adjacent properties are concentrated on rural amenity. Expectations for rural amenity are generally set by the District Plan through the Rural Zone rules and performance standards on the scale of buildings, noise limits, vehicle access design, traffic, and temporary effects during construction.

An objective visual analysis of the proposed solar farm on adjacent properties has been provided from suitably qualified landscape architects at Wayfinder. Wayfinder conclude that the actual and potential visual effects from the proposed solar farm are low or very low at each identified property because of distance, orientation / topography, or screened by existing mature hedgerows. The detailed assessment of each property is set out in page 12 – 15 of the LVA. Based on the analysis by Wayfinder, the actual and potential adverse visual effects on adjacent properties are considered to be less than minor.

The nighttime limits set in the District Plan can comply, and therefore meet the expectations of the Rural Zone.

Effects from temporary construction activities, including traffic, noise and earthworks associated with these activities, shall be managed by way of a Construction Management Plan, which will include a Construction Traffic Management Plan. This will ensure adverse effects are internalised to the site, comply with the New Zealand Standard NZS 6803: 1999 Acoustics Construction Noise, and ensure traffic does not generate adverse effects at the entry/exit points – such as dust, dirt on the road.

The Rural (Special) Zone is designed to support not only predominately rural activities, but also a range of other compatible activities. To that end, the presence or glimpse of a solar farm in the Rural (Special) Zone is not itself considered to be an adverse effect on those at adjacent properties.

To conclude, based on the assessment in Section 7 and above, there are no adversely effected parties identified in relation to the proposed solar farm and the application is expected to follow a non-notified process under the RMA.

## **9.** RELEVANT OBJECTIVES AND POLICIES

In accordance with Section 104(1)(b) of the RMA, a consent authority must, subject to Part 2 of the RMA, have regard to the relevant provisions of any statutory plans and policy statements. This includes any relevant provisions of:

- i) National Environmental Standards (NES)
- ii) Other regulations
- iii) National Policy Statements
- iv) The New Zealand Coastal Policy Statement (NZCPS)
- v) Regional Policy Statements or proposed Regional Policy Statements (**RPS**)
- vi) A Plan or Proposed Plan

The relevant National Environmental Standards are set out and responded to in Section 5.1-5.3 of this application. There are three NPS documents relevant to this land use consent application and the relevant provisions are considered below. The NZCPS is not relevant to this application. The Regional Policy Statement for the Wellington region gives regional direction on infrastructure and expectations for rural environments.



## 9.1 National Policy Statements

### 9.1.1 National Policy Statement for Renewable Electricity Generation (NPS REG)

The objective of NPS REG is to recognise the national significance of renewable electricity generation activities and Policies A of the document direct decision makers to recognise the benefit of these types of activities and list the following:

- a) maintaining or increasing electricity generation capacity while avoiding, reducing or displacing greenhouse gas emissions;
- b) maintaining or increasing security of electricity supply at local, regional and national levels by diversifying the type and/or location of electricity generation;
- c) using renewable natural resources rather than finite resources;
- d) the reversibility of the adverse effects on the environment of some renewable electricity generation technologies;
- e) avoiding reliance on imported fuels for the purposes of generating electricity.

The benefits listed in Policy A would be realised by the proposed solar farm.

Policy B directs decision makers to understand that significant development of renewable electricity generation activities is required if New Zealand is to meet its target for the generation of electricity from renewable resources.

Policy C directs decision makers to have particular regard to the realistic constraints to renewable electricity generation and allowance for these types of activities to develop mitigation opportunities.

The site selection process set out in the Section 3.2 of this application demonstrates that the availability of sites for solar farms must fit a number of functional and operational factors, as well as achieving a successful lease over the site, certainty of environmental approvals and capacity with the National Grid. The site selection process seeks to avoid areas that may have significant natural areas, significant landscape areas, high risk natural hazards, good local road networks and generally low levels of sensitive receptors, all to lessen the potential effects on the environment. Mitigation measures have been incorporated into the proposed activity.

Policy C2 directs decision makers to consider the use of offsetting and environmental compensation, should there be residual environmental effects from the renewable electricity generation activities that cannot be avoided, remedied or mitigated. Offsetting and environmental compensation is not relevant for this land use consent as the effects will be less than minor.

Policies D – H of the NPS REG relate to policy development in regional and district plans and are not relevant for this consent application.

In conclusion, the NPS REG encourages and supports renewable electricity generation activities such as that proposed in this application.

## 9.1.2 National Policy Statement for Highly Productive Land (NPS HPL)

The key principle of the NPS HPL is to protect the potential for land based productive activities on rural land

with high productive capability. As demonstrated in Section 2 of this application, the Carterton District has a considerable area of HPL (24,665ha) across the 117,997ha district. The HPL is predominantly LUC 3 land.

The Proposed District Plan identifies 'highly productive land' in the mapping as shown in **Figure 6**, the extent of the solar farm includes a small area on the south-west paddock boundary.

The intention of the NPS HPL is to protect the potential capacity of highly productive land and yet provision is made for activities such as infrastructure to use this resource, as long as there is sufficient rationale and effects on HPL are minimised or mitigated. The proposed solar farm meets the intention of the NPS HPL because of the following:

- The site selection process requires close proximity to the National Grid infrastructure; generally flat ground, avoiding highly sensitive areas and a positive agreement with landowner can be achieved. These factors are achieved at this site.
- Within the site, configurations of the layout have concentrated majority of the solar farm extent outside of HPL land.
- The 1ha included in the site enables existing paddock divisions to be maintained. The existing shelterbelt and fence line divides the larger property into the upper and lower river terraces.
- The solar farm extends over the lower river terrace and the 1ha of HPL land is within the lower terrace. Practically, it is more effective to use the 1ha HPL in conjunction with the solar farm, rather than an awkward area to manage along with the upper terrace.
- The upper river terrace, which is all LUC3, can continue to be used for primary production.
- The minor connections across the upper river terrace will not adversely affect the potential capacity of the paddocks, including:
  - the 5m wide corridor for the underground cable.
  - the new permanent vehicle access close to the fence line at 99 Cornwall Road.
- Notwithstanding the small area of HPL within the extent of the solar farm, the potential capacity of this highly productive land is not adversely affected by the 40 year use as a solar farm, as it can be decommissioned and return the 1ha of HPL area back to its current state, and there would be no permanent loss.

#### 9.1.3 National Policy Statement for Indigenous Biodiversity (NPS IB)

The National Policy Statement for Indigenous Biodiversity (NPSIB) applies to indigenous biodiversity in the terrestrial environment throughout Aotearoa New Zealand.

The objective of this National Policy Statement is to maintain indigenous biodiversity across Aotearoa New Zealand so that there is at least no overall loss in indigenous biodiversity.

One of the key actions from this policy statement is a consistent approach for territorial local authorities to identify significant natural areas (SNAs) and manage these better in District Plans (Policy 6 - 7). Policy 8 recognises and provides for the importance of maintaining indigenous biodiversity outside SNAs.

The site is not within an identified significant natural area, and the ecological assessment by Dr Forbes did not identify any terrestrial ecological values that required avoidance and therefore the NPS IB is not relevant in this instance.

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## 9.2 Regional Policy Statement – Greater Wellington Regional Council

Chapter 3 of the Regional Policy Statement (RPS) sets out the resource management issues, objectives and summary of policies and methods for the Wellington region, as is a statutory document to give regard to.

The relevant topics that are analysed against the proposed solar farm include:

- Section 3.3 Energy, infrastructure and waste
- Section 3.8 Natural Hazards
- Section 3.11 Soils and minerals

An analysis of the above confirms that the proposed solar farm responds to the direction provided by the RPS and is consistent with the relevant objectives and policies.

## 9.3 Operative District Plan

The relevant Objectives and Policies of the Combined Wairarapa District Plan have been analysed against the proposed solar farm activity and this is set out in **Appendix 12**.

In summary, the relevant objectives and policies explain that the Rural Zone, including the Special subzone, has the potential for renewable electricity generation activities, and that the benefits of renewable electricity are to be recognised. The rural character and amenity attributes listed in the objective and policy for the Rural Zones stem largely from primary production activities. Yet, the subject site lends itself to a solar farm because it is naturally hidden from view and is in an area surrounded by a range of rural industries, industrial activities and infrastructure and few sensitive receptors. The amenity and character of the area has capacity for the solar farm to locate and operate. The few residential dwellings that adjoin or are adjacent to the site, are in excess of 460m from the extent of the solar farm so temporary and operational noise can be internalised with the site and maintain a reasonable noise level for a rural environment.

The structures, buildings and associated earthworks can be designed to avoid worsening adverse effects from predicted flood waters (1 AEP%) on the site and adjoining properties.

Overall, the proposed solar farm can achieve the renewable energy for the national grid with a light footprint on the site and surrounds; generating at worst, less than minor adverse effects on the environment. The analysis above demonstrates that the proposed solar farm responds to the direction provided by the Operative District Plan and is consistent with the relevant objectives and policies.

## 9.4 Proposed District Plan

The relevant Objectives and Policies of the Proposed Combined Wairarapa District Plan have been analysed against the proposed solar farm activity and this is set out in **Appendix 12**.

In summary, the direction set by the Proposed District Plan in considering a proposed solar farm activity, within the General Rural Zone is reflected in the information and assessment provided in this application, through the description of the activity in Section 3, the AEE in Section 7 and supporting technical reports in the appendices. Overall, the proposed activity is considered to be consistent with the Proposed Plan.



## 9.5 Weighing of District Plans

The PDP was notified publicly notified in October 2023, with submissions closing on 19<sup>th</sup> December 2023. The summary of submissions has been released and 'further submissions' have now been called and shall close on the 23<sup>rd</sup> of April. The key issues and debates are unknown at this early stage and the PDP provisions are in their infancy therefore limited weight can be put on the new direction provided in this statutory document.

### 9.6 Conclusion on policy analysis

The site selected at 51, 99 and 107 Cornwall Road offers an optimal location for a solar farm because of the proximity to required infrastructure, good roading networks for safe and efficient use during construction and operation, a surrounding environment that is largely rural and industrial, and limited sensitive receptors.

There is a long-standing recognition and provision for renewable energy activities, where these activities manage adverse effects. The proposed configuration avoids as far as practical, the extent on HPL, opting to utilise the lower river terrace and the LUG land. The configuration and extent require careful consideration of the flood hazard risks. Yet, the predicted flood water during a sizeable event (1% AEP) can be managed through the avoidance of the overland flow paths; to let these physical features continue to operate unobstructed during an event. Further, flood water can pass under the structures involved in a solar farm, and structures that do not have the capability are to be located out of the predicted flood levels.

The proposed solar farm will introduce a new feature to the site and surrounds, yet direct and close views are avoided because the lower river terrace is difficult to view, and existing hedgerows screen it. There will be glimpses of the solar farm in between sparse gaps in the hedgerows, but this is not a negative outcome and demonstrates that renewable energy can sit within rural environments such as this. Noise, glint and glare, traffic can all be managed so the actual and potential effects are internalised, and/or have less than minor adverse effects on the environment and parties on adjacent properties.

Overall, the proposed solar farm will contribute to the supply of renewable energy to the National Grid, have negligible permanent effects on HPL, will be a complementary activity in the Rural (Special) Zone and have less than minor effects on the surrounding rural character and amenity. To that end, achieves the combined policy direction of the statutory documents listed above.

# 10. PART 2 OF THE RESOURCE MANAGEMENT ACT 1991

The assessments contained in Sections 7 and 9 of this report are subject to the matters contained in Part 2 of the RMA, which contains sections 5, 6, 7 and 8. Section 5 sets out the purpose of the RMA, and states:

The purpose of this Act is to promote the sustainable management of natural and physical resources.

In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—

- a. sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
- b. safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

(1)

(2)

c. avoiding, remedying, or mitigating any adverse effects of activities on the environment.

The purpose is supported by the principles of the Act set out in Section 6, 7 and 8. Sections 6 and 7 contain the "matters of national importance" and "other matters" respectively and Section 8 provides for the principles of the Treaty of Waitangi. These sections are hierarchical and provide for a different level of consideration to be given to each.

Section 5 refers to the use, development, and protection of natural and physical resources where such activities enable people and communities to provide for their social, economic and cultural well-being, while ensuring the environmental limits expressed in Section 5(2)(a) - (c) are also met.

In relation to managing the use, development and protection of natural and physical resources, decision makers are to recognise and provide for Section 6 matters. Section 6(a) - (d), (g) are not relevant to the considerations of the proposed solar farm. Section 6(f) and (h) respectively require the protection of historic heritage and management of significant risks from natural hazards. These matters are recognised and provided for through site design, detailed engineering design and protocols to follow during construction.

In response to Section 6(e), Section 7(a) and Section 8 engagement with mana whenua was commenced early and progressed based on high level responses from Rangitāne o Wairarapa.

In summary, the proposal can be considered consistent with the principles and purpose of the RMA and deserving of consent.

## 11. CONCLUSION

The applicant, Masterton Solar Farm Ltd, seeks land use consent for the construction, operation, and maintenance of a proposed solar farm at 51, 99 and 107 Cornwall Road.

The proposed activity is described in full in Section 3 of the application. The Statutory Considerations, Planning Documents and Consultation are set out in Sections 4, 5 and 6.

The conclusions reached in the assessment of environmental effects in Section 7 demonstrate that the proposed solar farm including the mitigation measures is an appropriate land use in the rural environment, at this particular site. Adverse effects on the environment are summarised as being less than minor.

Section 7 considers the actual and potential adverse effects on persons at adjacent properties. The findings from this assessment are that the effects are less than minor at each of the identified properties.

The policy analysis against relevant NPS documents, the Wellington Regions RPS, the Operative Combined Wairarapa District Plan and the Proposed Combined Wairarapa District Plan. The analysis demonstrates the proposed activity is consistent with these statutory documents.

The overall Part 2 check shows that the environmental and cultural parameters set in Section 5, 6, 7 and 8 are not threatened by enabling the use of the site for the proposed solar farm. Further, the proposed solar farm has positive effects at the local, regional and national level through the efficient production of renewable



electricity and direct connection to the National Grid.

Overall, the proposed activity is considered to be deserving of consent pursuant to sections 104 and 104B of the Resource Management Act 1991 and has also been demonstrated that the application can be processed on a non-notified basis.

Resource Consent Application for Land use 51, 99 and 107 Cornwall Road, Carterton 24023\_App1 I 16<sup>th</sup> April 2024





#### Interests

Client Reference

757970 Gazette Notice declaring portion of State Highway 2 a limited access road

205601.1 Compensation Certificate pursuant to Section 19 Public Works Act 1981 by Her Majesty the Queen - 27.8.1976 at 11.50 am

B377557.1 Land Improvement Agreement pursuant to Section 30A Soil Conservation and Rivers Control Act 1941 - 15.8.1994 at 12.18 pm

Appurtenant hereto is a right of way created by Easement Instrument 5982885.4 - 27.4.2004 at 9:00 am

The easements created by Easement Instrument 5982885.4 are subject to Section 243 (a) Resource Management Act 1991

Transaction ID 2377659





104927

Identifier



#### Interests

B292033.5 Encumbrance to Carterton District Council - 24.5.1993 at 9:06 am (Limited as to Duration) Appurtenant hereto is a water conveyance right created by Transfer B761072.6 - 17.12.1999 at 3.45 pm





B761072.2 Consent Notice pursuant to Section 221(1) Resource Management Act 1991 by The Carterton District Council - 17.12.1999 at 3.45 pm

Subject to a right of water conveyance over part marked C D E K on DP 88515 as sspecified in Easement Certificate B761072.5 - 17.12.1999 at 3.45 pm

Appurtenant hereto is a right of water conveyance created by Transfer B761072.6 - 17.12.1999 at 3.45 pm

12407214.6 Mortgage to ANZ Bank New Zealand Limited - 30.3.2022 at 5:09 pm





WN56B/59

Identifier

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#### CONSENT NOTICE

CONO B761072.2 Cons Cpy - 01/01, Pgs - 002, 11/04/06, 12:19

### SECTION 221 RESOURCE MANAGEMENT ACT 1991

#### TO: The District Land Registrar WELLINGTON

In the matter of a consent notice issued Pursuant to Section 221 of the Resource Management Act 1991 in respect of the subdivision of 3 allotments being a subdivision of Pt. Lot 2 DP 46533 and contained in Certificate of Title 42D/411 for deposit under No.88515

#### **Conditions of Subdivision**

1) No dwelling house or effluent disposal systems or fields be situated within 30 metres of the potential erosion zone as depicted on the survey plan in Lot 2 areas A,C,D,E,F,&G and in Lot 3 area H.

TAKE NOTICE that pursuant to Section 221 Resource Management Act 1991.

I, Milan Frank Hautler, Planning & Regulatory Manager of the Carterton District Council hereby certify that the conditions of subdivision, noted above to be complied with on a continuing basis, were imposed by the Carterton District Council on the date of subdivision approval of 6<sup>th</sup> day of July 1999, and I request that you note the Certificate of Title to the land accordingly.

Dated this 26<sup>th</sup> day of November 1999.

Signed by Milan Frank Hautler

Planning & Regulatory Manager of the Carterton District Council by authority of the Council under Section 252(1) of the Local Government Act 1974.

۶. antherts firs PAKING 3.45 17.DEC99 B 781972.2 AND REGIS REGIS The ZEAL In heoiSIER 2 LAND

## **EASEMENT CERTIFICATE**

(IMPORTANT: Registration of this certificate does not of itself create any of the easements specified herein).

	a 7(2)(a)		67	76/	074	- 2	E	Ľ
I/We	5 /(2)(d)	and	s 7(2)(a)					r
		_						

being the registered proprietor(s) of the land described in the Schedule hereto hereby certify that the easements specified in that Schedule, the servient tenements in relation to which are shown on a plan of survey deposited in the Land Registry Office at on the day of 19 under No. 88515

are the easements which it is intended shall be created by the operation of section 90A of the Land Transfer Act 1952.

Nature of Easement (e.g., Right of Way, etc.)       Lot No.(s) or other Legal Description       Colour, or Other Means of Identification, of Part Subject to Easement       Do notes Lot No.(s) or other Legal Description       Title Reference         Right to convey water       2       "C", "D", "E" & "K"       1       56B/58		Servie	ent Tenement 🛛 📐		
Right to convey water       2       "C", "D", "E"       1       56B/58         56B/59       4       "K"       1       1	Nature of Easement (e.g., Right of Way, etc.)	Lot No.(s) or other Legal Description	Colour, or Other Means of Identification, of Part Subject to Easement	Dominant Tenement Lot No.(s) or other Legal Description	Title Reference
	Right to convey water	2	"C", "D", "E" & "K"	1	56B/58 56B/59

#### SCHEDULE DEPOSITED PLAN NO. 4

State whether any rights or powers set out here are in addition to or in substitution for those set out in the Seventh Schedule to the Land Transfer Act 1952.

1. Rights and powers:

N/A





# EASEMENT CERTIFICATE

Land Transfer Act 1952





District Plan Compliance Assessment

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### Chapter 4 – Rural Zone

Condition		Analysis
I.5.2 Standar Permitte	ds for Permitted Activities ed activities shall comply with all of the astandards for the Pural Zono:	Definition of building
(a)	Maximum Building Height         i.       Dwellings:       10 metres         ii.       Other buildings:       15 metres         iii.       Within the Dark Sky Management         Area identified within Appendix 16	N/A Complies. N/A
	Outdoor Sports Lighting Poles at Recreational Facilities: 18 metres	
(b)	i. 3 metres height at the boundary with a 45-degree recession plane.	Complies
(c)	Minimum Building Setback (excluding	
	dwellings)	
	<ul> <li>i. 10 metres from the front road boundary of sealed roads.</li> <li>ii. 25 metres from the front road</li> </ul>	Does not comply. A 9m2 building is proposed within 10m of the Cornwall Road frontage. All other structure comply.
	boundary of unsealed roads.	N/A
	iii. 5 metres from all other boundaries.	Complies
	Waterbody listed in Appendix 1.9.	Complies – The solar panels will be located
	v. 5 metres from any other waterbody.	approximately 65m (estimate) from the adjoinin Wainagwa River which is a significant waterbod
		(i.e. Wm01).
(d)	Minimum Dwelling Setback	N/A
(e)	Number of Dwellings (including Minor	N/A
(1)	Dwellings)	
(f)	i The sound level from activities	Complies
	within any site, excluding mobile	
	sources associated with primary	
	harvesters), shall not exceed the	
	following limits within any	
	stated time-frames, when assessed	
	at any point within the notional	
	site within the Rural Zone but	
	excluding any dwelling on the	
	property where the sound levels are aenerated, and at any point within	
	the boundary of any site within the	
	Residential Zone::	
	Daytime         7.00am         7.00pm         55d5A L10           Nighttime         7.00pm         7.00am         45dBA L10	
	9.00pm - 7.00am 75dBA Lmax	
	in accordance with NZS 6801:1999	
	"Acoustics - Measurement of	
	environmental Sound", and assessed in accordance with NZS	
	6802:1991 "Assessment of	
	Environmental Sound". Exceptions	
	<u></u>	
		1

contours       (1) Signs       (2)       Any permanent sign shall be permitted provided it complets with the tollowing standards:       1. One sign per visite, with a total face are not exceeding 30:m2.       2. One sign per visite crossing not exceeding 02:m2 in tace are standards in the property and/or business or percenting default. Signs under this or percenting default. Signs under this or and imitted to displaying the names of the property and/or business or percenting default. Signs under this or and the sign shall completely with the sign shall completely within the sign shall be located three to conclude the within the sign shall be located three to device.         8. No sign shall be located where to concervity to which a total stepsort and the property. Provided the within the sign shall completely with the sign shall be located to the first or provide dimension.         9. No sign shall be located where to concervity to which are office config device.         10. A sign shall be located where to concervity and the sign shall completely item state.         11. The figure them this figure to the first order of any height of any height of any state of the property. Provided them this property.         12. A sign shall be located where to concervity to which are office configure the state of any height of any state.         13. The maximum height of any state of the first order to the first order to the first order to the state of any height of any state of the property.         13. The first office confies on the state off	(g	) Chester	Road Helia	copters Ope	eration Noise	N/A relates to noise sensitive activities
<ul> <li>(b) Sign: <ol> <li>(c) Sign: <ol> <li>(c) Sign: <ol> <li>(c) Sign: per site, with the following</li> <li>(c) One sign per vehicle crossing on the site of the crossing of the crossing of the site of the score of the sc</li></ol></li></ol></li></ol></li></ul>		contour	5			,
<ul> <li>(c) Any permanent sign shall be permitted provided it complex with the following standards:</li> <li>(i) Cone sign per site, with a foll face area, and limited to displaying the name of the property and/or business undertaken on the site and business operating details. Signs under this rule are excluded from complying with standards (10) and (11) below in intelation to Amarcetes an the sign.</li> <li>(a) The maximum height of any sign shall be located 0.0 metres.</li> <li>(b) At sign shall be located 0.0 metres.</li> <li>(c) Any permanent sign shall be located by within the side of the comply with the sign state on the site and business operating details. Signs and the site of the side of the comply with the side official sign or traffic-controlling device.</li> <li>(b) No sign shall be located where it andertok, or be illuminated. Inshing or the side of the exterior of any heritage item listed in Appendix 1.7 Heritage items.</li> <li>(c) A sign shall be comply with the side of the exterior of any heritage item listed in Appendix 1.7 Heritage items.</li> <li>(c) A sign shall be comply with the side of the scherior of any heritage item listed in Appendix 1.7 Heritage items.</li> <li>(d) A sign shall have no more than six words of symbolis for do more than 40 characters and it is to be located to here the board side of the si</li></ul>	(h	) Signs				
<ul> <li>Subduts</li> <li>One sign per site, with a total face area not exceeding 0.25m2 in face area, and limited to displaying the name of the property and/or business undertaken on the site and business operating defails. Signs under this rule are excluded from complying with standards (10) and (11) before the sign state of the sign state.</li> <li>Where sign is affixed to a building, the sign shall be located where it conceases the visibility of an existing of ficies of the sign state.</li> <li>All signs must comply with the sign of and setback requirements.</li> <li>No sign shall be catted where it conceases the visibility of an existing of the sign shall be affixed to the side in Appendix 5.</li> <li>No sign shall be affixed to the side in Appendix 5.</li> <li>No sign shall be affixed to the side in Appendix 1.</li> <li>No sign shall be affixed to the other side in Appendix 1. Heritage item is to be located so as to previde an on unrestricted view to the motorist for a minimum distance of 180 metres.</li> <li>The fallowing a minimum lefter/character height standards for a some tool sign metres and it is to be located in torsport Nuclei: Taffic Control Devices 2004 and the above standards provided they comply with the above standards.</li> </ul>	(a	) Any pe provide	ermanent s d it comp	ign shall b olies with th	e permitted ne following	Designed to comply.
<ul> <li>area not exceeding 3.0m2.</li> <li>Cone sign per vehicle crossing not exceeding 0.25m2 in face area, and limited to displaying the name of the property and/or business undertaken on the site and business operating details. Signs under this rule are excluded from complying with standards (10) and (11) below in relation to the cross 4.0 metres.</li> <li>The maximum height of any sign shall comply with the sign data of the sign and be located fully within the site of the activity undertaken on the site and business to the activity to writch relate to the activity and the relation of the site of the activity to writch in relate.</li> <li>Where a sign is affixed to a building, the sign shall comply with the sign distance requirements in Appendix X.</li> <li>Main signs must camply with the sign distance requirements in Appendix X.</li> <li>No sign shall be located where it concretes the visibility of and setbook requirements.</li> <li>No sign shall be located where it concretes the visibility of an existing official sign or traffic controlling device.</li> <li>No sign shall be affixed to the exterior of any heittge item listed in Appendix I.7 Heittge items.</li> <li>A sign shall complex the most find and the sign of a site of any heittge item listed in Appendix I.7 Heittge items.</li> <li>A sign shall have no more than six woords or symbols and no meet find 40 characters; and it is to be located or as to provide an unrestricted view to the motorist for a vision sing in the 70-100 km/hr speed zones shall be:</li> <li>The following minimum letter/character height standards to signs in the 70-100 km/hr speed zones shall be:</li> <li>Difficial rights gigs and excluded if from complying with the adove standards provided they comply with the adove standards provided they comply with the adove standards.</li> <li>The following is for public safety are excluded from complying with the adove standards.</li> </ul>		1.	One sign p	oer site, with	a total face	
<ul> <li>of the property and/or business operating details. Signs under this rule are excluded from compyling with standards (10) and (11) below in relation to characters on the sign.</li> <li>The maximum height of any sign shall not exceed 6.0 metros</li> <li>The sign must relate to the activity underdaken on the site and be located fully within the site of the activity to which it relates.</li> <li>Where a sign is affixed to a building, the sign shall compy with steader to activity to which it relates.</li> <li>Where a sign is affixed to a building.</li> <li>The sign shall be located where it conceases the visibility of an existing official sign or traffic-controlling device.</li> <li>No sign shall be located where it conceasits the visibility of an existing official sign or traffic-controlling device.</li> <li>No sign shall be affixed to the esterior of any helitage item listed in Appendix 1.7 Heritage items.</li> <li>A sign shall have no more than six words or symbols and no more than 40 characters; and it is to be located with the following minimum letter's or so to provide an unrestricted view to the motorist for a minimum distance of 180 meters.</li> <li>The following minimum letter's to an existing cortex; and it is to be located within the total to be located to be not for a minimum distance of 180 meters.</li> <li>The following minimum letter's for an minimum distance of 180 meters.</li> <li>The following minimum letter's to a so to provide an unrestricted view to the motorist for a minimum distance of 180 mm</li> <li><u>Steed Main Property Second</u> 150 mm</li> <li><u>Excention:</u> <ol> <li>Official Traffic Signs are excluded from complying with the above standards provided they comply with t</li></ol></li></ul>		2.	area not e One sign exceeding and limite	exceeding 3. per vehicle g 0.25m2 in d to displayir	0m2. crossing not face area, ng the name	
<ul> <li>with standards 1(0) and (11) below in relation to characters on the sign.</li> <li>3. The maximum height of any sign shall not exceed 6.0 metres</li> <li>4. The sign must relate to the activity undertaken on the site and be located fully within the sile of the activity to which it relates.</li> <li>5. Where a sign is affixed to a building, the sign shall comply with the maximum height and selback requirements.</li> <li>6. All sign smust comply with the sight distance requirements in Appendix 5.</li> <li>7. No sign shall be located where it concreat the visibility of an existing official sign or traffic-controlling device.</li> <li>8. No sign shall use reflective materials, or be illuminated, flashing or moving.</li> <li>9. No sign shall be affixed to the exterior of any heitinge item listed in Appendix 1.7 Heritage Items.</li> <li>10. A sign shall have to more than six words or symbols and no more than 40 characters; and it is to be located view to the motorist for a minimum distance of 180 metres.</li> <li>11. The following minimum letter/eharacter is may a the motorist for signs in the 70-100 km/hr speed zone's shall be:</li> <li>12. Stepping is sommal 100 mm 100 kph 200 mm 120 mm 100 mm</li> <li>14. Official Traffic Signs are excluded from complying with the above standards provided they comply with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs for public safety are excluded from complying with the above standards.</li> </ul>			of the pr undertake operating rule are e	operty and n on the site details. Sigr xcluded fror	and business and business ns under this m complying	
<ul> <li>3. The maximum height of any sign shall not exceed 6.0 metres</li> <li>4. The sign must relate to the activity undertaken on the site and be located fully within the site of the activity to which it relates.</li> <li>5. Where a sign is affixed to a building, the sign shall comply with the sight distance requirements in Appendix 5.</li> <li>7. No sign shall be located where it conceads the visibility of an existing official sign or froffic-controlling device.</li> <li>8. No sign shall be located where it conceads the visibility of an existing official sign or froffic-controlling device.</li> <li>9. No sign shall be located where it conceads the visibility of an existing official sign or froffic-controlling device.</li> <li>9. No sign shall be located the sign of model of the exterior of any heritage item listed in Appendix 1.7 Heritage Items.</li> <li>10. A sign shall have no more than six words or symbols and no more than 40 character height standards for signs in the 70-100 km/hr speed zones shall be located how the motorist for a minimum listence of 180 metres.</li> <li>11. The following minimum letter/private thad standards for signs in the 70-100 km/hr speed zones shall be:</li> <li>Speed Massage Name 120 mm 125 mm 120 mm</li> <li>Exception: <ul> <li>i. Official traffic Signs are excluded from complying with the above standards.</li> <li>ii. Official ligs for public safety are excluded from complying with the above standards.</li> </ul> </li> </ul>			with stand in relation	ards (10) an to character	d (11) below rs on the sign.	
<ul> <li>4. The sign must relate to the activity undertaken on the sile and be located fully within the sile of the activity to which it relates.</li> <li>5. Where as ign is affixed to a building, the sign shall comply with the sign that and setback requirements.</li> <li>6. All signs must comply with the sight distance requirements in Appendix 5.</li> <li>7. No sign shall be located where it conceals the visibility of an existing official sign or frotific-controlling device.</li> <li>8. No sign shall use reflective materials, or for for the controlling device.</li> <li>8. No sign shall be affixed to the exterior of any heritage item listed in Appendix 1.7 Heritage item listed in Appendix 1.7 Heritage item sited any environg.</li> <li>9. No sign shall have no more than six words or symbols and no more than 40 characters; and it is to be tocated so as to provide an unrestricted view to the motorisit for a minimum distance of 180 metres.</li> <li>10. The following minimum listerial standards for signs in the 70-100 km/hrs speed zores shall be:</li> <li>11. The following 190 mm 100 mm</li> <li>12. Maing Name Name Name</li> <li>13. Diricial Traffic Signs are excluded from complying with the above standards provided in the power provide sign of 190 mm</li> <li>10. Official Traffic Signs are excluded from complying with the bove standards provided they comply with the dot from complying with the above standards.</li> </ul>		3.	The maxir	num height xceed 6.0 m	of any sign	
<ul> <li>located fully within the site of the activity to which it relates.</li> <li>5. Where a sign is affixed to a building, the sign shall comply with the sight distance requirements.</li> <li>6. All signs must comply with the sight distance requirements in Appendix 5.</li> <li>7. No sign shall be located where it conceats the visibility of an existing device.</li> <li>8. No sign shall use reflective materials, or be illuminated, flashing or moving.</li> <li>9. No sign shall be affixed to the extension of an on one than six words or symbols and no more than six words or symbols and no more than 40 characters; and it is to be located view of a sign shall have no more than six words or symbols and no more than 40 characters; and it is to be located view to the motorist for a minimum distance of 180 metres.</li> <li>10. The following minimum lefter/character height standards for signs in the 70-100 km/hr speed zones shall be:</li> <li>Speed Main 190 mm 190 mm 190 mm</li> <li>80 km 250 mm 175 mm 125 mm 100 km</li> <li>10. Official Traffic Signs are excluded for comply with the dool for dispression (Kuter Traffic Signs and Marking (MOTSAM)).</li> <li>10. Official fraffic Signs of they comply with the adoove standards.</li> </ul>		4.	The sign m undertake	nust relate to n on the s	o the activity site and be	
<ul> <li>5. Where a sign is affixed to a building, the sign shall comply with the sight maximum height and setback requirements.</li> <li>6. All signs must comply with the sight distance requirements in Appendix 5.</li> <li>7. No sign shall be located where it conceals the visbility of an existing device.</li> <li>8. No sign shall be affixed to the exterior of any heitage item listed in Appendix 1.7 Heitage item listed in Appendix 1.7 Heitage item listed in Appendix 1.7 Heitage item.</li> <li>10. A sign shall be affixed no the exterior of any heitage item listed in Appendix 1.7 Heitage items.</li> <li>10. A sign shall be affixed no more than six words or symbols can do more than a words or symbols can do more than a minimum distance of 180 metres.</li> <li>11. The following minimum letter/character height standards for signs in the 70-100 km/hr speed zones shall be:</li> <li>Speed Main Property Second for Maximum 125 mm 100 km</li> <li>80 with 300 mm 120 mm 150 mm</li> <li>Exception: <ol> <li>Official Traffic Signs are excluded from comply with the Land Transport Rule: Traffic Comply with the add from comply with the add transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs one Marking (MOTSAM).</li> <li>Official signs for public sofety are excluded from complying with the add transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs one Marking (MOTSAM).</li> </ol></li></ul>			located fu activity to	ully within th which it rela	e site of the tes.	
<ul> <li>In the sign situal comply with the sight and setback requirements.</li> <li>All signs must comply with the sight distance requirements in Appendix 5.</li> <li>No sign shall be located where it conceals the visibility of an existing official sign or traffic-controlling device.</li> <li>No sign shall be affixed to the exterior of any heritage item listed in Appendix or be officed to the exterior of any heritage item.</li> <li>A sign shall be affixed to the exterior of any heritage item.</li> <li>A sign shall be affixed to the other exterior of any heritage item.</li> <li>A sign shall have no more than six words or symbols and no more than 40 characters; and it is to be located so as to provide an unrestricted view to the motorist for a minimum distance of 180 metres.</li> <li>The following minimum left property Second for signs in the 70-100 km/hr speed zones shall be:</li> <li>Speed Main 200 mm 150 mm 100 mm</li> <li>Standards provide the control for more comply with the adversion comply with the adversion of first standards for signs in the 200 mm 150 mm.</li> <li>Exception: <ul> <li>Official Iraffic Signs are excluded from complying with the adversion complying with the adversion of more provide standards provided they comply with the Lond Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM).</li> <li>Official signs for public safety are excluded from complying with the adversion complyin</li></ul></li></ul>		5.	Where a si	gn is affixed	to a building,	
<ul> <li>All signs must comply with the sight distance requirements in Appendix 5.</li> <li>No sign shall be located where it conceals the visibility of an existing official sign or foffic-controlling device.</li> <li>No sign shall use reflective materials, or be illuminated, flashing or moving.</li> <li>No sign shall be affixed to the exterior of any heftage item listed in Appendix 1.7 Herdage Items.</li> <li>A sign shall have no more than six words or symbols and no more than 40 characters; and it is to be located so as to provide an unrestricted view to the motorist for a minimum distance of 180 metres.</li> <li>The following minimum letter/character height standards for signs in the 70-100 km/hr speed zones shall be:</li> <li>Speed Main Property Second for some 150 mm</li> <li>Exception: <ol> <li>Official Taffic Signs are excluded from complying with the above standards provided they comply with the Land Transport Rule: Taffic Control Devices 2004 and the dave standards provided they comply with the adove standards.</li> </ol> </li> </ul>			maximum requireme	height an nts.	nd setback	
<ul> <li>No sign shall be located where if conceals the visibility of an existing afficial sign or fraffic-controlling device.</li> <li>8. No sign shall use reflective materials, or be illuminated, flashing or moving.</li> <li>9. No sign shall be affixed to the exterior of any heitage item listed in Appendix 1.7 Heritage item six words or symbols and no more than six words or symbols and no more than 40 characters; and it is to be located so as to provide an unrestricted view to the motorist for a minimum distance of 180 metres.</li> <li>11. The following minimum letter/character height standards for signs in the 70-100 km/hr speed zones shall be zones they comply second works and the zone zones shall be zones shall be zones they comply is with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM).</li> <li>ii. Official signs for public safety are excluded from complying with the zone zones shall be zones zones shall be zones zones and working (MOTSAM).</li> </ul>		6.	All signs m distance r	ust comply v equirements	with the sight in Appendix	
concecls the visibility of an existing official sign or fraffic-controlling device.         8. No sign shall use reflective materials or be illuminated, flashing or moving.         9. No sign shall be affixed to the exterior of any heritage items.         10. A sign shall have no more than six words or symbols and no more than 40 characters; and it is to be located so as to provide an unrestricted view to the motorist for a minimum distance of 180 metres.         11. The following minimum letter/character height standards for signs in the 70-100 km/hr speed zones shall be:         Speed       Mains Property Second Message via the solve standards for signs and the use of the motorist for a minimum 150 mm 100 mm 80 kpt         250 mm 175 mm 125 mm 100 kpt       Second Message Via the concept second message via the dards provided they comply with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs for public safety are excluded from complying with the above standards provided they comply with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs for public safety are excluded from complying with the above standards.		7.	J. No sign st	nall be loca	ted where it	
<ul> <li>B. No sign shall use reflective materials, or be illuminated, flashing or moving.</li> <li>9. No sign shall be offixed to the exterior of any heritage item listed in Appendix 1.7 Heritage Items.</li> <li>10. A sign shall have no more than six words or symbols and no more than 40 characters; and it is to be located so as to provide an unrestricted view to the motorist for a minimum distance of 180 metres.</li> <li>11. The following minimum letter/character height standards tor signs in the 70-100 km/hr speed zones shall be:</li> <li>Speed Main Property Second Message 70 kph 200 mm 150 mm 100 mm 100 kph 300 mm 200 mm 150 mm</li> <li>10 official Traffic Signs are excluded from complying with the above standards provide they comply with the Lond Traffic Signs and Marking (MOTSAM).</li> <li>ii. Official signs for public safety are excluded from complying with the above standards.</li> </ul>			conceals official sig	the visibility o gn or traff	ot an existing ic-controlling	
<ul> <li>materials, or be illuminated, flashing or moving.</li> <li>9. No sign shall be affixed to the exterior of any heritage item listed in Appendix 1.7 Heritage item listed in Appendix 1.7 Heritage items.</li> <li>10. A sign shall have no more than six words or symbols and no more than 40 characters; and it is to be located so as to provide an unrestricted view to the motorist for a minimum distance of 180 metres.</li> <li>11. The following minimum letter/character height standards for signs in the 70-100 km/hr speed zones shall be:</li> <li>Speed Main Property Second Message 70 kph 200 mm 150 mm 100 mm 80 kph 300 mm 200 mm 150 mm</li> <li>Exception: <ol> <li>Official Traffic Signs are excluded from complying with the above standards provide they comply with the land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM).</li> <li>Official signs for public safety are excluded in Control Devices 2004 and the above standards.</li> </ol> </li> </ul>		8.	uevice. No sign	shall use	e reflective	
<ul> <li>9. No sign shall be affixed to the exterior of any heritage item listed in Appendix I.7 Heritage items.</li> <li>10. A sign shall have no more than six words or symbols and no more than 40 characters; and it is to be located so as to provide an unrestricted view to the motorist for a minimum distance of 180 metres.</li> <li>11. The following minimum letter/character height standards for signs in the 70-100 km/hr speed zones shall be:</li> <li>Speed Main Property Second Message 70 kph 200 mm 150 mm 100 mm 80 kph 250 mm 175 mm 125 mm 100 kph 300 mm 200 mm 150 mm</li> <li>Exception: <ul> <li>i. Official Traffic Signs are excluded from complying with the above standards provided they comply with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM).</li> <li>ii. Official signs for public safety are excluded from complying with the above standards.</li> </ul> </li> </ul>			materials, or moving	or be illumino	ated, flashing	
extenor of any nemrage items.         10. A sign shall have no more than six words or symbols and no more than 40 characters; and it is to be located so as to provide an unrestricted view to the motorist for a minimum distance of 180 metres.         11. The following minimum letter/character height standards for signs in the 70-100 km/hr speed zones shall be:         Speed       Main         Property       Second         80 kgn       250 mm         100 kph       300 mm         200 mm       150 mm         100 kph       200 mm         100 kph       00 kph         100 kph       00 kph         100 kph       00 kph         100 kph       00 mm         100 kph       00 mm <tr< td=""><td></td><td>9.</td><td>No sign s</td><td>shall be aff</td><td>fixed to the</td><td></td></tr<>		9.	No sign s	shall be aff	fixed to the	
<ul> <li>10. A sign shall have no more than six words or symbols and no more than 40 characters; and it is to be located so as to provide an unrestricted view to the motorist for a minimum distance of 180 metres.</li> <li>11. The following minimum letter/character height standards for signs in the 70-100 km/hr speed zones shall be:</li> <li>Speed Main Property Second Message 70 kph 200 mm 150 mm 100 mm 80 kph 250 mm 175 mm 100 mm 100 kph 300 mm 200 mm 150 mm</li> <li>Exception: <ol> <li>Official Traffic Signs are excluded from complying with the above standards provided they comply with the character fragers and Manual of Traffic Signs and Marking (MOTSAM).</li> <li>Official Signs for public safety are excluded from complying with the above standards.</li> </ol> </li> </ul>			in Append	any neritag lix 1.7 Heritag	ge Item listed ge Items.	
40 characters; and it is to be be located so as to provide an unrestricted view to the motorist for a minimum distance of 180 metres.         11. The following minimum letter/character height standards for signs in the 70-100 km/hr speed zones shall be:         Speed       Main         Property       Second         80 kph       200 mm         100 kph       300 mm         200 mm       150 mm         100 kph       300 mm         100 kph       300 mm		10.	A sign sha words or sy	Ill have no n mbols and r	nore than six	
Interstite of the motorist for a minimum distance of 180 metres.         11. The following minimum lefter/character height standards for signs in the 70-100 km/hr speed zones shall be:         Speed       Main Property Second Message         70 kph       200 mm         80 kpt       250 mm         100 kph       300 mm         200 mm       150 mm         i.       Official Traffic Signs and Marking (MOTSAM).         ii.       Official signs for public safety are excluded f			40 chara	cters; and	it is to be	
a minimum distance of 180 metres. 1.1. The following minimum letter/character height standards for signs in the 70-100 km/hr speed zones shall be: Speed Main Property Second Message 70 kph 200 mm 150 mm 100 mm 80 kph 250 mm 175 mm 125 mm 100 kph 300 mm 200 mm 150 mm Exception: i. Official Traffic Signs are excluded from complying with the above standards provided they comply with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM). ii. Official signs for public safety are excluded from complying with the above standards.			unrestricte	so as to d view to the	e motorist for	
Interference       Interference		11	a minimun	n distance of	f 180 metres.	
For signs in the 70-100 km/hr speed zones shall be:         Speed       Main       Property       Second         70 kph       200 mm       150 mm       100 mm         80 kph       250 mm       175 mm       125 mm         100 kph       300 mm       200 mm       150 mm         Exception:         i.       Official Traffic Signs are excluded from complying with the above standards provided they comply with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM).         ii.       Official signs for public safety are excluded from complying with the above standards.			letter/cha	racter heigh	nt standards	
Speed       Main Message       Property Name       Second Message         70 kph       200 mm       150 mm       100 mm         80 kph       250 mm       175 mm       125 mm         100 kph       300 mm       200 mm       150 mm         Exception: i. Official Traffic Signs are excluded from complying with the above standards provided they comply with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM).         ii.       Official signs for public safety are excluded from complying with the above standards.		$\sim$	tor signs in zones shal	the 70-100 be:	km/hr speed	
70 kph       200 mm       150 mm       100 mm         80 kph       250 mm       175 mm       125 mm         100 kph       300 mm       200 mm       150 mm         Exception:         i.       Official Traffic Signs are excluded         from complying with the above       standards provided they comply         with the Land Transport Rule: Traffic       Control Devices 2004 and the         Manual of Traffic Signs and Marking       (MOTSAM).         ii.       Official signs for public safety are         excluded from complying with the       above standards.		Speed	Main Message	Property Name	Second Message	
oven       200 mm       175 mm       125 mm         100 kph       300 mm       200 mm       150 mm         Exception:       i.       Official Traffic Signs are excluded         from complying with the above standards provided they comply       with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM).         ii.       Official signs for public safety are excluded from complying with the above standards.		70 kph	200 mm	150 mm	100 mm	
Exception:       i.       Official Traffic Signs are excluded from complying with the above standards provided they comply with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM).         ii.       Official signs for public safety are excluded from complying with the above standards.		100 kph	250 mm	200 mm	125 mm	
<ul> <li>Official Traffic Signs are excluded from complying with the above standards provided they comply with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM).</li> <li>Official signs for public safety are excluded from complying with the above standards.</li> </ul>		<u>Exc</u>	eption:	200 mm	150 mm	
standards provided they comply with the Land Transport Rule: Traffic Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM). ii. Official signs for public safety are excluded from complying with the above standards.		١.	from com	iplying with	the above	
Control Devices 2004 and the Manual of Traffic Signs and Marking (MOTSAM). ii. Official signs for public safety are excluded from complying with the above standards.			standards with the La	provided t	t Rule: Traffic	
ii. Official signs for public safety are excluded from complying with the above standards.			Control E Manual of	Devices 200 Traffic Signs	and Marking	
above sianaaras.		ii.	Official sig	ns for publi from comply	c safety are ying with the	
7			above sta	ndards.		
	<b>7</b>					

		Dees not comply
(i)	Roads, Access, Parking and Loading Areas	Does not comply
	i. Compliance with the standards in	
	Appendix 5 requirements for Roads,	
	Access, Parking and Loading,	
	ii One vehicle access point per	Complies
	frontage	
	iii No contiguous carparkina area	N/A
	containing five or more parking	
	spaces including access and	
	manoeuvring areas	
		N/A
(j)	Plantation Forestry	
(k)	Intensive Farming	N/A
0		N/A
()	Conservation Management	
(m)	Disposal of Wastewater from a Muncipal	N/A
	Wastowator Troatmont Plant shall comply	
	wasiewalei nealmeni nam shali compiy	
	with the following setback distances:	

#### Chapter 21 – District Wide Land Use Rules

NOTE:

(i) The permitted activity rules listed below shall apply within all Environmental Zones and Management Areas unless otherwise specified under the rules below.

(ii) All of the listed permitted activities under this section shall also comply with the relevant standards for permitted activities specified within the underlying Environmental Zones and Management Areas unless otherwise stated in the rules below.

Condition		Analysis
21.1.1	Notable Trees and Street Trees	N/A
21.1.2	Sites of Historic Heritage Value	N/A
21.1.3	Historic Heritage Precincts	N/A
21.1.4	Outstanding Landscapes	N/A
21.1.5	Significant Natural Areas	N/A
21.1.6	Indigenous Vegetation and Habitats	N/A
21.1.7	Wetland Restoration and Enhancement	N/A
21.1.8	Reserves	N/A
	<ul> <li>(a) Earthworks within 25 metres of any Significant Waterbody listed in Appendix 1.9 for the following purposes:         <ul> <li>The maintenance of drains, fences, man-made dams, access tracks and roads;</li> <li>Approaches to culverts.</li> </ul> </li> </ul>	
21.1.10	Activities on the Surface of Freshwater	N/A
21.1.11	Outdoor Artificial Light         (a) The emission of outdoor artificial light (including glare) meets the following standard:         i.       A maximum artificial light level of 8 lux (lumens per square metre) measured at 1.5m above ground	N/A

	<ul> <li>ii. Within the Dark Sky Management Area identified within Appendix 16, all outdoor lighting shall have a colour temperature of light emitted of 3000K Kelvin or lower.</li> <li>iii. Within the Dark Sky Management Area identified within Appendix 16, all outdoor lighting with a light output of 500 lamp lumens or greater shall be shielded or tilted so as to not emit any light at or above a horizontal plane measured at the light source.</li> </ul>	
	<ul> <li>iv. Lighting controlled by motion- activated switches limiting the duration of illumination to less than five (5) minutes after activation are exempt from complying with standards (II) and (III) above.</li> <li>v. Night-time works for the construction, maintenance and upgrading of network utilities and energy generation facilities undertaken by a network utility operator or wind energy facility operator are exempt from complying with standards (II) and (III) above.</li> <li>vi. Lighting on existing buildings or structures erected or maintained pursuant to civil aviation or</li> </ul>	
21.1.12	manifime transport legislation are exempt from complying with standards (II) and (III) above.       with standards (II) and (III) above.         vii.       Lighting from or mounted to moveable vehicles.         Dust and Odour       (a) The generation of airborne contaminants meets the following standard:	Designed to comply.
	<ul> <li>No nuisance at or beyond the boundary of the site to the extent it causes an adverse effect. This standard applies to contaminants which are not subject to a discharge consent and which are temporary or intermittent in nature, including:         <ul> <li>(1) Dust;</li> <li>(2) Offensive or objectionable odour.</li> </ul> </li> </ul>	
21.1.13	Noise         (a) Noise Emission Levels shall be subject to zone rules for noise, and shall comply with the standards below.         (b) General <ol> <li>Sound levels shall be measured in accordance with NZS 6801:1999</li> <li>"Acoustics – Measurement of Sound", and assessed in accordance with NZS 6802:1991</li> <li>"Assessment of Environmental Sound".</li> <li>(c) Construction Noise                 <ul> <li>Construction noise shall be measured and assessed in accordance with NZS 6803:1999</li> </ul> </li> </ol>	Designed to comply.
		I

	"Acoustics – Construction Noise" and shall not exceed the noise limits set out in Table 2 of that Standard for the timeframes stated. ii. Provided that the provisions of the standard related to the duration of construction events and the more or less stringent noise limits applicable in such circumstances shall apply.	
21.1.14	Derelict Vehicles(a) The storage of no more than one derelict vehicle per site where it is visible from any adjacent property or a public place.	N/A
21.1.15	Access to Premises (a) No fortifications shall be placed on any property so as to preclude or inhibit entry by the Police or any authorised officer.	N/A
21.1.16	Temporary Activities	N/A
21.1.17	Coastal Environment Management Area	N/A
21.1.18	Foreshore Protection Area	N/A
21.1.19 21.1.20	Faultline Hazard Area           Flood Hazard Area and Erosion Hazard Area           (a) Any activity within the Flood Hazard Area or Erosion Hazard Area that does not involve	N/A
	<ul> <li>one or more of the following:</li> <li>i. The erection, placement, alteration of or addition to any non-habitable structure greater than 4 metres in height or with a gross floor area (GFA) of greater than 15 m<sup>2</sup>.</li> </ul>	Applicable
	<ul> <li>ii. Earrnworks of more fran 20m3 per site within any 12 month period;</li> <li>iii. The addition or alteration to an existing building for habitable use (refer Rule 21.4.7);</li> <li>iv. The erection, placement, or</li> </ul>	N/A N/A
21.1.21	conversion of a building for habitable use (refer Rule 21.6(r)). Soil Conservation and River Control Works	
21.1.22	Hazardous Substances and Facilities	N/A
	(a) The total quantity of hazardous substances on the site shall not exceed the quantities for the relevant zone specified as a Permitted Activity in "Appendix 2.1: Hazardous Facilities Consent Status Table", and shall comply with the following standards:	
	i, Site Design	
	Any part of a hazardous facility which is involved in the manufacture, mixing, packaging, storage, loading, unloading, transfer, use or handling of hazardous substances must be designed, constructed and operated in a manner which prevents:	
	<ol> <li>The occurrence of adverse off-site effects from the above listed activities on people, ecosystems, physical structures and/or other parts of the environment unless permitted by a</li> </ol>	

	<ol> <li>The contamination of air, land and/or water (including aquifers, potable water supplies and surface waters) in the event of a spill or other type of release of hazardous substances.</li> </ol>	
	ii. Site Layout	
	The hazardous facility must be designed in a manner to ensure that separation between on-site facilities and the property boundary is sufficient for the adequate protection of neighbouring facilities, land uses and sensitive environments.	
	iii. Site Drainage Systems	
	Site drainage systems must be designed, constructed and operated in a manner that prevents the entry of hazardous substances into the stormwater and/or sewerage systems unless permitted to do so by the network utility operator responsible for those stormwater and/or sewerage systems.	
	iv. Spill Containment Systems	
	Any parts of the hazardous facility site where a hazardous substances spill may occur must be serviced by suitable spill containment systems that are:	
	<ol> <li>Constructed from impervious materials resistant to the hazardous substances used, stored, manufactured, mixed, packaged, loaded, unloaded or otherwise handled on the site;</li> <li>For liquid hazardous substances:         <ul> <li>(a) Able to contain the maximum volume of the largest container present plus an allowance for stormwater or fire water; and</li> </ul> </li> </ol>	
	<ul> <li>(b) Where the substances are stored in drums or other small packaging that the spill containment system is able to contain 50% of the maximum volume of substances stored plus an</li> </ul>	
	<ul><li>allowance for stormwater of thre water;</li><li>3. Able to prevent the entry of any spill or other unintentional release of</li></ul>	
	hazardous substances, or any contaminated stormwater and/or fire water into site drainage systems unless permitted to do so by a network utility operator;	
21.1.23	Activities within Contaminated Land	N/A
21.1.24	Network Utilities and Energy Generation Facilities	
	<ul> <li>(a) The construction, maintenance and upgrading of network utilities and energy generation facilities which meets the following standards:         <ol> <li>Maximum Height and Setbacks</li> <li>All above ground network utility and meteorological structures, except lines.</li> </ol> </li> </ul>	N/A
	meteorological structures, except lines,	

<ul> <li>poles, towers, masts, aerials, antennas and their brackets or attachments, must comply with the maximum height standards, maximum height to boundary, and minimum building setback, for the Environmental Zone in which they are located, except as follows:</li> <li>In the case of aerials and antennas, and their brackets or attachments, that are located on buildings these</li> </ul>	N/A
<ul> <li>may exceed the maximum height and maximum height to boundary standards for the Environmental Zone in which they are located by no more than 5 metres.</li> <li>2. Aerials and antennas attached to masts, poles and towers may exceed the maximum height for masts, poles and towers as set out in sub-clause (3) below and the maximum height for mast below.</li> </ul>	N/A
the Environmental Zone in which they are located, by no more than 5 metres. The maximum height to boundary shall not apply to the boundary of a road, road reserve or service lane. The minimum building setback and maximum height to boundary shall not apply to the boundary of a road, road reserve or	
<ul> <li>3. In the case of masts, poles and towers (except as provided for under Rules 21.1.24(a)(ix)(1) (i) and (j), these shall comply with a maximum height of:</li> <li>(a) 20 metres in Rural, Commercial and Industrial Zones.</li> <li>(b) 12 metres in Residential Zone.</li> <li>(c) 10 metres in road, road reserve or service lane for any Environmental</li> </ul>	N/A N/A N/A N/A
Zone. ii. Antennas Residential Zone: 1. No dish antenna shall exceed 2m in diameter; 2. No panel antenna shall exceed 2.5m in any dimension; 3. Rural, Commercial and Industrial Zones:	N/A
<ul> <li>4. No dish antenna shall exceed 5m in diameter;</li> <li>5. No panel antenna shall exceed 2.5m in any dimension.</li> <li>iii. Building</li> <li>1. No building located above ground for network utility purposes shall exceed 10m<sup>2</sup> in gross floor area.</li> <li>2. Duilding for methods with the statemethous of the stat</li></ul>	N/A
<ul> <li>2. Buildings used for network utilities purposes may encroach the minimum building setbacks in the respective Environmental Zone in which it is located, subject to compliance with the following:</li> <li>(a) 3 metres from any boundary when located on a site in the Residential</li> </ul>	N/A

	Zone, or adjoining the Residential	
	Zone; (b) Compliance with the Noise Standards for the respective Environmental Zone in which it is located.	
	<ul> <li>iv. Radiofrequency Exposure</li> <li>1. The maximum exposure levels shall not exceed the levels specified in NZS 2772:1999 "Radiofrequency fields - Maximum exposure levels - 3 kHz to 300 GHz";</li> <li>2. Maximum exposure levels shall be 3kHz to 300GHz in areas normally responsible to the public</li> </ul>	N/A N/A
	<ul> <li>v. High Voltage Electricity Transmission Lines</li> <li>1. Lines for conveying electricity shall have a voltage up to and including 110kV;</li> </ul>	N/A
	<ol> <li>Setback 20 metres from dwellings.</li> <li>vi. Water Supplies</li> <li>Water supply and irrigation schemes and all related drains, channels, pipes and necessary incidental equipment for the conveyance of water.</li> </ol>	N/A
	<ul> <li>vii. Wastewater and Stormwater</li> <li>1. Underground pumping stations and pipe networks for the conveyance or drainage of water or sewage, and necessary incidental equipment.</li> </ul>	N/A N/A
	<ul> <li>viii. Traffic Management</li> <li>1. Traffic management and control structures, street lighting, and street furniture.</li> <li>ix. Existing Network Utilities</li> <li>x. Existing Energy Generation Facilities</li> <li>xi. Undergrounding of Lines and Pipes</li> <li>xii. Reinstatement</li> <li>xiii. Noise Limits</li> </ul>	N/A N/A N/A
21.1.25	Roads, Access, Parking and Loading Areas           (a) All new roads, intersections, access, parking and loading areas shall be provided in accordance with the provisions of Appendix           5 - Requirements for Roads, Access, Parking and loading	<b>Does not comply</b> Refer to Transportation Assessment Report for detail against Appendix 5.
	(b) Access i. All sites and activities shall have safe and practicable vehicle access from a public road. All vehicle crossings and intersections shall be positioned and constructed in accordance with the standards in Appendix 5.	<b>Does not comply</b> Refer to Transportation Assessment Report for detail against Appendix 5.
	<ul> <li>(c) Parking and Loading <ol> <li>Provision of On-Site Parking and Loading</li> <li>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</li> </ol> </li> </ul>	<b>Does not comply</b> Refer to Transportation Assessment Report for detail against Appendix 5.
	11	

<ul> <li>the activity, in accordance with Table 21.1.25.1 below.</li> <li>2. Where any activity is changed or any building erected or altered, sufficient vehicle parking and loading shall be provided to meet the demands generated by the altered activity or building, in accordance with Table 21.1.25.1 below.</li> <li>3. On sites where there are multiple activities, and each activity requires vehicle parking required shall be the combined total requirement for all activities. The Council will consider reducing parking requirements, where it is demonstrable that parking teaching and spaces may be counted as parking will occur.</li> <li>4. Loading bays and spaces may be counted as parking spaces able to be according to the number of parking spaces able to be according to the number of parking spaces able to be according to the number of parking spaces able to be according to the number of parking spaces.</li> <li>5. Where the calculation of required vehicle parking spaces results in a fraction of a whole space, any fraction less than or equal to one half shall be diregarded; and any fraction over one half shall count as one space.</li> <li>6. The area of required spaces, access dives, or aisles provided within a building spaces shall be excluded from the gross floor area (GFA) of the building.</li> <li>7. Vehicle parking spaces shall be provided for activity is in a tractor of the activity is that is alosest in nature to that proposed activity shall be applied. Parking spaces do activity is in a tractord of the activity is the that is alosest in nature to that proposed activity is and that papped applied. Parking spaces to applied. Parking spaces in nature to that proposed activities.</li> </ul>	

A . 11. 11.	Darking encode required		
Activity	Parking spaces required		
Accommodation Activities	1 per accommodation unit, room, or campsite,		
	plus 1 per 2 employees		
Childcare Centre	1 per employee, plus 1 per 10 persons to be		
	accommodated in the centre.		
Commercial Activities (including, but not	1 per 45m <sup>2</sup> GFA, plus 1 per 100m <sup>2</sup> outdoor		
limited to retail, supermarkets and offices)	display area		
Educational Facilities (primary and	1 per employee		
secondary)	, ber enderstee		
Educational Eacilities (tertiany)	1 per employee plus 1 per 10 students		
Educational Facilities (toritary)			
Emergency Service Facilities	1 per 100m <sup>2</sup> GFA, plus 1 per on duty staff		
	member (excluding volunteers)		
Entertainment facility	1 per 3 persons the facility is designed to		
	accommodate		
Health Facility	4 per practitioner		
- I dailing			
Hospital	1 per bed the facility is designed to accommodate,		
	plus 1 per 2 staff members on site		
Industrial Activities	1 per 50m <sup>2</sup> GFA		
Place of Assembly	1 per 4 persons the place is designed to		
	accommodate		
Residential Activities	1 per residential unit		
	•		
Restaurant	1 per 4 persons the facility is designed to		
	accommodate.		
Resthome	1 per 4 beds the facility is designed to		
	accommodate, plus 1 per employee on site.		
Sports fields and playing fields	1 for every 3 participants (design capacity)		
· · · · ·			
Tavern	1 per 10m <sup>2</sup> GFA		

Note 1: GFA means Gross Floor Area and includes office space associated with the primary industrial activity not commercial

offices or retail space.

Note 2: Where an existing building within the Commercial Zone is being used by a permitted activity the requirements outlined above do not need to be met.

For the purposes of the above parking requirements the following definitions shall apply:

Accommodation Activities – (parking requirements) activities including associated land and buildings used for accommodating

people on a temporary basis; includes but is not limited to hotels, motels, and camping grounds but excludes homestays that do not exceed four people.

Education facility – (parking requirement) facilities including associated land and buildings used for the purposes of learning

and training, including facilities for preschool, primary, secondary, tertiary and adult learning.

**Health facility** – (parking requirement) facilities including associated land and buildings used for the purposes of providing healthcare to the community and include but is not limited to dentistry, veterinary and medical centres or clinics but excluding hospitals. **Hospital** – (parking requirement) facilities including associated land and buildings used for the purposes of providing 24 hour healthcare service to the community.

**Industrial Activities** – (parking requirement) activities including associated land and buildings used for manufacturing, fabricating, processing, packing or storage of goods, substances or vehicles, and the servicing and repair of goods and vehicles whether by machinery or hand.

**Office** – (parking requirement) an activity including associated buildings or part of a building where people are engaged in a

profession, business or administrative activity and includes but is not restricted to financial, law or accountancy firms, valuers, banks, architects, engineers and real estate agents.

**Outdoor display area** – (parking requirement) an outdoor space provided for the display of retail goods or services for purchase and excludes parking, landscaping or other similar required areas.



21.1.26	<ol> <li>Every parking space shall be designed and constructed in accordance with AS/NZS 2890.1:2004 Parking Facilities.</li> <li>Each required loading space shall be of usable shape and have a minimum length of 7.5 metres, minimum width of 3.5 metres, and minimum clear height of 4.5 metres. Sufficient manoeuvring space shall be provided to accommodate a 90 percentile two-axle truck. In the Commercial and Industrial Zones where articulated vehicles are to be used, the layout shall be designed to accommodate such vehicles.</li> <li>vii. Standards of Construction of Vehicle Parking Spaces</li> <li>All required vehicle parking spaces and access aisles shall be formed, sealed and marked, and shall be provided with surface water drainage.</li> <li>Water supply, wastewater and stormwater</li> </ol>	
	All new water systems, waste water systems and stormwater systems shall be provided in accordance with NZS 4404:2004 "Land Development and Subdivision Engineering"	N/A
21.1.27	Financial Contributions         (a) All financial contributions shall be in accordance with the requirements of Section 23.	Expected to comply
21.2.18	Aerodrome Protection         (a) Aerodrome Obstacle Limitation Surfaces         i. No building, other structure, mast or tree         shall be located in the Aerodrome         Obstacle Limitation Surfaces so as to         penetrate the 1:50 approach slopes, the         transitional slopes or the horizontal         surface.	N/A
	The Obstacle Limitation Surfaces are shown on the Planning Maps and defined in Appendix 11. They comprise land in the shape of a fan, located at the ends of the landing/takeoff strips and vertically below the take- off/approach slopes of the strips. (b) Air Noise Boundaries	N/A





CF Projects: Drawing Set

**CF Projects: Civil Report** 





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D	Client	MASTERTON SOLAR LIMITED		



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# **RESOURCE CONSENT**

# **CAMERON FAUVEL PROJECTS**

# **Masterton Solar Farm**

# Preliminary Civil Infrastructure Assessment

Date: February 2024

Document Number 23048-EW1

Prepared by: C F Projects Ltd

Prepared for: Masterton Solar Farm Limited



CAMERON FAUVEL PROJECTS

# **Document Control and Quality Statement**

#### **Revision History**

Revision №	Prepared By	Description	Date
0	Mark Sprowson	For Consent	7/12/2023
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#### **Document Acceptance**

Action	Name	Signed	Date
Approved by	Mac Fauvel		9/04/2024
on behalf of	CF Projects Ltd		

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CAMERON FAUVEL PROJECTS

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# 1 Introduction & Background

#### 1.1 Introduction

CF Projects Ltd has been engaged by Masterton Solar Farm Limited to undertake preliminary civil designs and assessments for a proposed solar farm to support the required consents. The site is located in Carterton District, just south of the boundary with Masterton District Council, on a rural property adjacent to an existing Transpower Substation and overhead transmission lines. The site location has been shown in Figure 1, below. The proposed development consists of a 25.8 hectare solar farm and associated infrastructure, further commentary has been provided below.



Figure 1. Site Location

This report aims to provide an overview of:

- Changes to the environment (contours, stormwater) as a result of the civil works associated with the proposed solar farm.
- Preliminary designs for civil infrastructure required to service the proposed solar farm.
- Impact on the identified flood hazard area and recommended mitigation



#### 1.2 Site Description

The site is located off Cornwall Road on the southern bank of the Waingawa River, as shown in Figure 2 below, and currently held in pasture/farmland. The site is approximately 25 hectares and generally flat, falling at a grade of between 1 percent from the western boundary towards the eastern boundary. There is approximately 5 metres of fall across the site.

The northern boundary of the site is bound by the southern bank of the Waingawa River, which is offset with a 100-metre vegetated buffer roughly aligning with the outer river management zone managed by Greater Wellington Regional Council. The remaining three site boundaries boarder the existing farmland/property.



Figure 2. Contour Plan of Subject Site

The site is currently utilised as farmland (grazed) with only minor improvements to the land such as, planted hedges/shelter belts, access tracks and fencing. Only very minor established vegetation is present on the site.

Although the site is relatively flat, there are a number of historic flow paths through the site which present as shallow dry channels through the site. These remain dry year-round however would likely activate in heavy rainfall concentrating flow from the site towards the eastern boundary.

The site has been mapped within a flood hazard area by Greater Wellington Regional Council, further discussion on the implications of this is covered in Section 5 below.



#### 1.3 Proposed Development

We understand that it is proposed to develop the subject site to facilitate the installation of a new solar farm. Conceptual plans for the proposed solar farm have been provided to develop the preliminary civil designs and assessments outline in this report.

The solar farm consists of solar panels installed in uniform rows across the site. The precise location of each row of panels will be determined during the detailed design stage. Conceptual plans are based on rows of solar modules 60 metres in length, with sufficient space between each row to prevent inter-row shading, orientated in a north/south direction. Although changes to the internal site layout may alter slightly depending on the final electrical designs, the general panel layout will be consistent with the provided concept design. The developed conceptual design consists (approximately) of the following elements;

- Total site area occupied by solar modules; 22 hectares
- Total length of internal unsealed accessways; 1,300 metres
- Site Compound/Laydown area; 450 square metres

Where possible, in order to optimise the site layout, the civil infrastructure has been designed to align with the orientation of the rows of solar panels. The following civil works is required to be designed to service the construction and operation of the proposal;

- Vehicle access, entrances and internal roads
- Site compound and lay down areas (hardstands)
- Drainage (i.e. swales and culverts)
- Trenching works

#### 1.4 Site Investigations

The following site investigations have been undertaken to inform the preliminary civil designs and assessments.

- Analysis of Digital Elevation Model (DEM) Data from available LiDAR
- Site walkovers and visual inspections

In additional to the specific site work mentioned above the following external reports have been provided.

- RDCL Preliminary Geotechnical Assessment (dated 16 October 2023)





### 2 Earthworks

Bulk earthworks and re-contouring across the site will not be required to facilitate the proposed development. Available LiDAR elevation data for the site shows average fall across the site is approximately 1 percent with small, localised areas of site reach a maximum grade of approximately 5%. These locations are over short distances (circa 20 metres) and can be accommodated in the design and construction of modules.

Earthworks will be limited to the construction of internal access tracks, trenching works, formation of drainage channels, swales, culverts and respreading of stockpiled topsoil. Earthworks will not be required to facilitate the installation of solar panel modules and tracking systems.

The proposed works has a relatively light footprint, limited to piling works for the solar module mounting system, trenching and accessway construction.

Internal access roads are expected to follow the existing site contours limiting the depth of excavation, further discussion on pavement depths and formation is discussed below. Geotechnical investigations indicate topsoil depths are approximately 300mm across the site (ref. table 4 RDCL Geotechnical Report).

Stripping of topsoil for the internal roads will make up the majority of the required earthworks for the proposed development, inclusive of hard stand areas approximately 2631 cubic metres of topsoil will be generated. A portion of this material will be re-used (such as lining swales and landscaped areas), the remainder will be either stockpiled or respread on-site with the intention of re-using this material when the site is remediated at the end of the solar farms operational life.

The works consist of the following earthworks volumes;

- Topsoil Strip (internal accessways) 2,631 cubic metres
- Respread of Topsoil (swales/drains) 936 cubic metres
- Topsoil Balance (to be retained onsite) 1,695 cubic metres



# 3 Internal Vehicle Accessways

#### 3.1 Pavement Design

Geotechnical Investigations indicate a minimum bearing capacities of 150 Kpa (ultimate) is available under cleared topsoil depths (i.e. 300mm) while a bearing capacity of 300Kpa (ultimate) is available from 800mm below ground level.

CBR bearing capacities between 2.71% and 7.49% are available between 300mm and 800mm below ground level. A design CBR of 4.5% available at approximately 500mm below ground level has been selected for preliminary pavement designs.

The internal roads will be heavily trafficked during construction however only limited use during the life of the solar farm, a conservative Design Traffic ESA (DESA) of 10<sup>5</sup> has been calculated, utilizing Pavement Design CBR Charts a minimum granular pavement thickness of 300mm has been calculated, see figure 3 below.



#### Figure 3. Pavement Design CBR Chart

A pavement consisting of a 50mm thick compacted AP20 running coarse on a 250mm thick compacted AP65 sub-base on a compacted subgrade achieving a minimum CBR of 5% is suitable for the proposed development.

The unbound (i.e. unsealed) granular pavement is suitable for the low traffic volumes and also allows for improved drainage. Some additional maintenance maybe required (i.e. grading) over the life of the development however the cost of this is negligible considering the cost of an alternative sealed pavement.



#### 3.2 Road Layout

The conceptual road layout has been designed to provide access through the site, the road orientation has been selected to run parallel to the rows of solar panels. It is anticipated the final layout may change dependent on the final design and position of critical infrastructure however it is understood that the following key features will remain consistent;

- Construction and operational access will be provided from the existing agricultural business located approximately 200 metres to the southeast of the site.
- The internal access track will largely run parallel to the Transpower transmission lines which currently run through the site.
- Secondary access, formed off an existing farm service road, will be utilised during construction.
- Carriageway width of internal roads will be 4.0 metres
- Carriageways will have a duel crossfall (3.0%) falling towards shallow roadside swales

Typical pavement details and road layouts have been shown on the attached preliminary civil design, appended to this report.

#### 3.3 Site Access (Vehicle Crossings)

The site will be accessed off Cornwall Road utilising existing vehicle crossing locations as outlined above. Vehicle tracking completed by East Cape Consulting (ECC) has confirmed that improvements to the existing geometry are not required to facilitate safe entry and exit into the site.

Both access locations cross the Taratahi Water Race, the water race is operated and maintained by Carterton District Council. No changes or upgrades to the existing culverts are proposed or required to facilitate the solar farm development, a visual inspection of the culverts has been undertaken and the following observations can be made;

- Culverts are approximately 9 metres in length (maximum width measured on single vehicle tracking is 5 metres at point crossing culvert).
- Culvert diameter is DN300
- Culverts are concrete and appear in reasonable condition at time of inspection
- Culverts have sufficient cover under access (approx. 600mm)





# 4 Utility and Trenching Design

Specific design of trench details and locations will be undertaken during a detailed design phase prior to commencement of construction. Typical trench details have been provided, as shown in figures 4 and 5, which show trench dimensions and duct layouts. The proposed typical trench details are typical for conventional buried electrical cabling, trenching work will be undertaken by the civil contractor while the laying and pulling of electrical cabling will be the responsibility of the electrical sub-contractor.

Electrical cabling will be laid in trenches between 1.0 and 1.6 metres in depth in order to achieve the required cable layout and minimum cover (typically 600mm).

Bedding material placed around ducts and cabling is typically specifically specified to ensure ducts and cables are not damaged during installation.

Where possible site won material is reused above bedding material with the exception of locations such as roads and accessways.

Trench depth, compaction of material, selection of backfill medium and finishing/reinstatement of the surface should be undertaken in consideration of the following recommendations;

- Overlying 500mm of topsoil/silts should be retained and reused on top of trench.
- Trench backfills should be compacted to 95% of MDD to avoid settlement of surface
- Trenches should be reinstated as soon as practical leaving a level, flush surface finish.



#### AC TYPE 2.C- 1.60x0.8m



Figure 4. Typical Trench Details



# 5 Stormwater Management & Flooding

Given the low intensity of the proposed development it is not anticipated to have a significant impact or require significant infrastructure to manage stormwater runoff. Although the proposed panels themselves are impermeable they are raised sufficiently above ground level maintaining the existing surface resulting in a negligible increase in the sites runoff coefficients (i.e. installation of panels will not significantly decrease the permeable area).

The site has been mapped within the 1% AEP flood hazards zone by Greater Wellington Regional Council, both current flood models and draft flood hazard models have been considered in our assessment below of the risks, mitigations and recommendations discussed below. Consultation with GWRC has been undertake and correspondence attached in appendix B.

#### 5.1 Preliminary Flooding Assessment

The site has been mapped within a flood hazard zone by GWRC, hazard maps for both active and draft flood hazard models have been presented below. Current flood models show flood water mainly concentrated around existing overland flow paths and depressions closest to the river corridor, with depths between 300 to 1000mm and hazard rating of low to medium. Draft flood models show a larger portion of the site impacted by flood extents however it is understood impacts will be generally consistent with the current plans (i.e. flood depths and hazards). Typical solar tracking system can pass flood water between 500mm and 900mm dependant on orientation, where flood depth exceed this specific foundation design would allow passage of deeper flood water, see figure 8.

Based on the available flood modelling and elevation data the proposed development can be undertaken with negligible impact on flood extents and neighbouring properties when completed in consideration with the following recommendations;

- Filling within overland flow paths shall not be undertaken
- Important infrastructure (such as Power Conversion Units (PCUs)) should be placed at locations where they will not be impacted by flood extents, if this cannot be achieved they should be positioned on earth bunds providing 500mm freeboard above the modelled flood depths
- It is recommended that existing planting on the northwestern boundary is maintained to minimise flood debris entering site where it may collect on the solar mounting/tracking system foundations/piles.
- Although the site is outside the outer river management zone it is recommended that a further 50 metre buffer for critical infrastructure (such as inverters) is applied.
- A detailed design shall be completed detailing heights of all accessways, site compounds and PCU locations, care should be taken when converting flood height datums to local co-ordinates. The detailed design should confirm that the location of infrastructure will not impact on the modelled 1% AEP flood event.
- A flood hazard management plan may be developed for the site, this may include such measures as monitoring of inclement weather, positioning of panels in optimal orientation during flooding to allow water to pass safely during flood events and maintenance of swales and/or overland flow paths.





Figure 6. Current Flood Depth Maps





Figure 7. DRAFT 1% AEP Flood Maps





#### 5.2 Overland Flow Paths

No permanent flowing streams or overland flow paths are present on the site however the site is traversed with shallow depressions and channels which direct overland flow from the northwestern boundary towards the southeastern boundary. Figure 9 shows a digital analysis of available LiDAR elevation data which show channel depth is typically 300 – 500mm lower than the surrounding land. The typical width of channel are between 10 and 20 metres.

Detail design and construction of the proposed solar farm should be completed in consideration of these overland flow paths. Maintain existing site levels through identified overland flow paths will ensure that impacts on neighbouring properties and flood levels are appropriately mitigated.



Figure 9. Analysis of LiDAR Elevation Data.



#### 5.3 Stormwater Management

Additional stormwater runoff generated from the solar farm will be managed on-site, areas where runoff will need to be manged will be limited to internal accessways, site compounds and temporary buildings/structures (such as PCU, O&M buildings/ site storage containers/sheds).

We understand that stormwater will be collected of temporary buildings in tanks for re-use on-site.

All internal accessways and laydown areas will be unsealed resulting in only a minor increase in runoff coefficients. Excess runoff from roads and laydown areas will be managed via grassed swales, where stormwater flows can be attenuated through storage in the swales or soakage through in line rock soakage trenches.

A proposed road cross section, shown in Figure 10 below, allows for two 1.20-metre-wide grassed swales providing 0.18 m<sup>3</sup> of storage per linear metre of road.

We recommend that attenuation of rainfall events up to the 1-hour 10year (10% AEP) event are attenuate via soakage trenches within swales while events up to the 1 hour 100 year (1% AEP) will be contained within the road side swales.

Specific details of drainage and swales should be developed at detailed design stage.





### 6 Recommendations and Conclusions

Based on our assessment the civil works required for the solar farm are achievable, in consideration of the following recommendations and conclusions;

- Earthworks required for the solar farm is minor in the context of the size of the site, primarily consisting of topsoil removed for the construction of internal accessways.
- Excess volumes of topsoil generated will be retained onsite. Care should be taken to ensure that topsoil stockpiles or respread areas don't alter overland flow paths.
- The proposed development will not significantly increase runoff. The primary stormwater management/attenuation method will be grassed swales.
- The site is within a mapped flood hazard area. Development of the site in consideration of recommendations outlined in section 5.0 will result in negligible impacts to the site and surrounding properties. Specifically, development of the site in consideration of recommendations will not increase the likelihood of flooding and/or erosion or increase the magnitude of flooding impacts on adjacent properties.
- The following should be considered at time of detailed design;
  - Detailed design of finished site levels, road levels and floor levels of any specific infrastructure should be specified relative to modelled flood levels.
  - Provision of 500mm freeboard above critical infrastructure (i.e. PCU's) should be provided.
  - o Bulk earthworks plans include topsoil stockpile locations
  - o Internal accessway long sections and set out information

### 7 Limitations

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CFP otherwise disclaims responsibility to any person other Masterton Solar Farm Limited arising in connection with this report. CFP also excludes implied warranties and conditions, to the extent legally permissible.

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The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. CFP has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.



# APPENDIX A – Preliminary Civil Design Drawings



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- 3. CONTOURS SHOWN ARE GENERATED FROM LIDAR INFORMATION.

# **RESOURCE CONSENT**

	Original Size	Drawing No: 23048-EW1	101	Rev: A
	Title	FLOOD ZONES PLAN		
N	Project	SOLAR FARM - MASTERTON		
D	Client	MASTERTON SOLAR LIMITED		



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Α	FOR RESOURCE CONSENT	KA	30.06.23	MF	30.06.23
No	Revision	Drawn	Date	Approved	Date



Plot Date: 8 April 2024 - 9:54 am

Plotted by: Kevin Astwood

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Plot Date: 22 February 2024 - 1:10 pm Plotted by: Kevin Astwood

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Luke Cameron | BE (Civil) MEM CPEng.Mac Fauvel | BE (Civil)T | +64 27 405 5492T | +64 27 641 5590E | luke.cameron@cfprojects.co.nzE | mac.fauvel@cfprojects.co.nz

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	<u>www.cfprojects.co.nz</u> Masterton, New Zealand	any other person or for any other purpose.	Scale AS SHOWN	Original Siz	<sup>2e</sup> Drawing No: 23048-EW1 350 Rev: A
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### NOTES

- THIS PLAN TO BE READ IN CONJUNCTION WITH ALL OTHER 1. RELEVANT PROJECT DRAWINGS AND SPECIFICATIONS.
- 2. WORK TO BE IN ACCORDANCE WITH NEW ZEALAND BUILDING CODE, NZS4404:2010, LAND DEVELOPMENT AND SUBDIVISION INFRASTRUCTURE, AND MASTERTON DISTRICT COUNCIL ENGINEERING REQUIREMENTS.

# **RESOURCE CONSENT**



# APPENDIX B – GWRC Correspondence

#### **Mac Fauvel**

From: Sent: To: Cc: Subject: Kirsty Duff <Kirsty.Duff@gw.govt.nz> Thursday, 28 September 2023 4:05 pm Mac Fauvel Des Peterson RE: Waingawa Flood Map Information

Kia ora Mac,

I have a few recommendations:

- 1. The location of one of the panels that I have circled in red in the snip below, is very close to the river corridor hazard. This hazard is subject to both flooding and erosion hazard, and it could also be effected by debris during an event. I recommend moving this panel further away from this hazard.
- 2. Two of the inverters are out of the flood hazard completely, I recommend building any infrastructure at least 300mm above ground level. If its possible to do 500mm I would stretch to that, this way you should be well clear of any impacts of surface flooding.
- 3. The third inverter which I have circled in fuchsia, is within an overland flow path. There is quite and obvious flow path here when looking at the ariel photography. Is it possible to move the inverter to another location? this area will be subject to not only high water levels but fast flowing water during a significant flood event.

In response to your question about debris I have a couple of thoughts to consider:

- Planting could help, though stopping debris rafts in a large event will be very difficult but you could reduce the effects of debris from small nuisance flooding events. Flaxes and grasses can be used to catch smaller woody debris and can also act as sediment barriers, capturing some sediment in smaller events. Though if a significant event comes though, it is likely the site will have silt or sediments deposits as well as woody debris.
- I also recommend consider site plans/actions on a severe weather warning event. For example if there is a way to cover some the components of the solar panels so they would not be effected by the silts in a flood, this could be triggered on a severe weather warning from MetService.
- You could potentially change the direction of the panels? So they were perpendicular to the river, this could help debris flow around the panels instead of getting stuck and causing damage. Though I understand this may not be possible as you will be placing them to get the most sun light.

be affected by for Wellington Region of this plan assum individual in relation

Ngā mihi Kirsty



**Kirsty Duff** 

Kaipūkaha | Senior Engineer – Water Knowledge Greater Wellington Te Pane Matua Taiao 021 58 4684 100 Cuba St, Te Aro, Wellington 6011 Follow us online: Facebook | Twitter | gw.govt.nz From: Mac Fauvel <mac.fauvel@cfprojects.co.nz>
Sent: Tuesday, September 26, 2023 5:02 PM
To: Kirsty Duff <Kirsty.Duff@gw.govt.nz>
Cc: Des Peterson <Des.Peterson@gw.govt.nz>
Subject: RE: Waingawa Flood Map Information

Hi Kirsty,

We're still working through the development of the site layouts but have a bit more information I can share now, I've attached mark ups of the flood maps you sent through where I've also overlaid the proposed solar farm layout.

The intent of the design is to have as little impact on the site as possible, when the panels are at their end of life I believe the intention is to pull out and return to farm land. Each panel is supported on a single pile which are at approximately 6 metre centres.

The panels themselves should be well out of any flood level (circa 3 metres from ground level) however there is some infrastructure at ground level. I've mark up on the attached plans and included in the attached kmz file the position of three inverters (containerised units which are basically dropped into place and plugged in) which will need to be above flood level, I'm thinking on a small earth platform (say 10m x 10m). If this doesn't work there is a little scope to re-position.

Are you about to provide flood depths in these three locations?

We still need to do some work on the flood assessment, now we have the layout somewhat confirmed we can start this work. My biggest concern is probably the piles catching debris during a flood event, however as the intention is either leave or plant additional shelter belts I think this some what mitigates that risk. If you have any thoughts on this it would be good to hear them?

Thanks

Mac Fauvel BE (Civil), MEngNZ Civil Engineer



#### **CAMERON FAUVEL PROJECTS**

E: mac.fauvel@cfprojects.co.nz P: +64 27 641 5590 CF Projects Ltd, PO Box 167, Masterton 5810 www.cfprojects.co.nz

From: Kirsty Duff <<u>Kirsty.Duff@gw.govt.nz</u>> Sent: Tuesday, August 1, 2023 12:55 PM To: Mac Fauvel <<u>mac.fauvel@cfprojects.co.nz</u>> Cc: Des Peterson <<u>Des.Peterson@gw.govt.nz</u>> Subject: RE: Waingawa Flood Map Information

Kia ora Mac,

Des has passed your request on to me.

#### Flood hazard at Lot 2 DP 325931, from the Waingawa River

- Please find attached a flood hazard map as well as a flood depth map.
- The property is within 1% Annual Exceedance Probability (AEP) plus climate change flood extent from flooding of the Waingawa River. The Depth varies from 0.3 1m across the flooded area.

- I have also attached a map of our Draft district plan flood hazard overlays. These have been provided to the combined Wairarapa District Planning board. We use the hazard overlay categories to identify areas subject to higher and lower hazard, and guide our recommendations.
- The flood hazard map is created from a combination of velocity and depth data, areas within the flood hazard map that are in medium to high hazard have deep water and fast velocities.

#### Activities near overland flow paths.

- Diversion of floodwaters and construction in waterways may also require resource consent from Greater Wellington. Please contact Notifications@gw.govt.nz for pre-application advice.
- We recommend contacting Masterton District Council (MDC) therefore I recommend contacting them to ٠ obtain advice on rules or controls stream.
- Areas classified within River Corridor or High Hazard are considered high hazard zones and development in • these locations is not recommend.
- We recommend a site specific flood assessment for the medium and high hazard zones by an appropriately qualified engineer, to insure that development will not pass the flood hazard to existing properties and buildings are designed to withstand the flood hazard.

#### **GWRC Flood Protection recommends:**

- That you discuss any proposed development with MDC;
- That the property owners notify their insurer of this flood risk; and

Where land on which building work is to be carried out is subject to, or likely to be subject to flood hazard, if MDC grants a building consent under Section 72 of the Building Act 2004 they shall include a notation on the Certificate of Title. It is SWDC's responsibility to notify the owner if there will be a registration. We suggest that you discuss this with them directly.

Ngā mihi Kirsty



#### **Kirsty Duff**

Kaipūkaha | Engineer – Water Knowledge Greater Wellington Te Pane Matua Taiao 021 58 4684 100 Cuba St, Te Aro, Wellington 6011 Follow us online: Facebook | Twitter | gw.govt.nz

From: Des Peterson < Des.Peterson@gw.govt.nz > Sent: Friday, 28 July 2023 8:40 am To: Kirsty Duff <Kirsty.Duff@gw.govt.nz> Subject: FW: Waingawa Flood Map Information

Hi Kirsty

Been dealing with Mac Fauvels questions around flooding on Waingawa River. Having trouble getting flood level data from Draft Upper Ruamahanga Flood Hazard Extent info I have. As I can only see extents no depth information and he is also after velocities which I have no data on. The map below shows the area in question with red line. Any chance you can help Mac out please, probably gone as far as I can with helping him.

#### Cheers



Wayfinder: Landscape and Visual Assessment (LVA)

# Landscape & Visual Effects Assessment

Proposed Solar Farm Masterton

> Prepared For: Masterton Solar Farm Ltd April 2024

W Y F I N D E R Landscape Planning & Strategy

### Contents

- Introduction Methodology
- Landscape Context
- Policy Context
- Proposal
- Assessment
- Visual Effects
- Conclusion

#### **Document Control**

Report Title:	Landscape and Visual Effects Assessment				
Client:	Masterton Solar Farm Ltd				
Client Contact:	Claire Price – Stradegy Ltd				
Report Author:	Alexia Hamelink				
Report Reviewer:	Shannon Bray				
Revision:	1	2	3		
Date:	14.02.24	09.04.24	15.04.24		
Status:	DRAFT	DRAFT	FINAL		

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Wayfinder Landscape Planning & Strategy Ltd PO Box 851, Hastings

www.wayfinder.nz



### Introduction

Masterton Solar Farm Ltd is proposing a solar energy generation facility approximately 5km south of Masterton. The project is estimated to generate up to 12.5MW AC of electricity.

The proposal includes construction and operational activities associated with solar energy generation, including the installation of between 25,000 – 35,000 solar panels that are aligned north-west, and tilt to follow the suns path from east to west. Underground cabling connects the solar panels to Power Conversion Units (PCUs) that convert the DC electricity collected from the solar panels into AC electricity, and then export this into the local distribution network via the nearest existing 33kV overhead line.

This report has been prepared to provide an assessment of the potential landscape and visual effects of the proposal. It is to be read in conjunction with Appendix 4b, which provides maps and visualisations of the proposal alongside photographs of the site and locality.

This report concludes that although the solar farm will be a change to existing productive rural landscape there are several mitigating factors that diminish the level of effects. Overall, it is considered that the landscape effects of the proposal will be *low*, and the visual effects will be *low* to *very-low*, overall translating to *less than minor*.

### Methodology

A site and locality visit was undertaken on Tuesday 20<sup>th</sup> June, 2023. This included visiting the following locations by vehicle, stopping where safe to obtain views of the site:

- Driving across the site, accessed via existing farm tracks;
- Cornwall Road, from State Highway Two (SH2), approximately 1.5km to the southeast
- Norfolk Road, from SH2, approximately 100m to the northwest;
- State Highway 2, from the intersection with Cornwall Road, approximately 1.2km to the northeast and 700m to the southwest.

A series of photographs were taken from the wider area, which identified sensitive receptors (residential dwellings) and these are shown on a map of the surrounding area and is attached.

In addition, two visualisations of the proposal have been prepared, one from approximately 170m north of the entrance to 107 Cornwall Road and 245m southwest of the southern corner of the site. The other visualisation is from a photograph taken on SH2 approximately 220m north of the Cornwall Road/SH2 intersection, directly opposite the entrance to 4022 State Highway 2. These visualisations were prepared using the following methodology:


- Capturing a photograph of the site from a known location and height (using GPS), with a set camera focal length;
- Preparing a simple 3D model of the proposal in Vectorworks software using information provided by the project engineers;
- Aligning the 3D model with the photograph location using specialist tools in the software and capturing an image using the same focal length;
- Overlaying the 3D model over the photograph using Adobe Photoshop;
- Enhancing the imagery of the solar farm using specialist tools in the software to represent the various components of the solar farm;
- Editing elements of the solar farm from the image that would not be visible from the selected viewpoint because they would sit behind other existing features captured in the image; and
- Mounting the photograph into a document using Adobe InDesign.

The assessment to inform this report was undertaken using knowledge gained during the site visit, in addition to online tools such as Google Maps, Google Street View and the Council online GIS portal.

No private properties were visited during the assessment, but enough information is available to be able to extrapolate the considered effects from neighbouring properties.

#### **Scale of Effects**

The New Zealand Institute of Landscape Architects has published technical guidelines for landscape assessment<sup>1</sup> which has informed the preparation of this document. This includes the use of a 7-point assessment rating scale which has been adopted for this report, as follows:

This Assessment	Very-Low	Low	Low-Mod	Moderate	Mod-High	High	Very-High
RMA	Less than Minor Minor		More than Minor				
						Signi	ficant

The scale deliberately avoids the use of more traditional RMA terminology, such as minor or less than minor, and (as the NZILA guidelines set out) caution is needed in directly translating the 7-point scale of each identified effects into an RMA terminology. Rather, the degree of individual effects are assessed first, and then – following

<sup>1</sup> Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines', Tuia Pito Ora New Zealand Institute of Landscape Architects, July 2022.

that – an overall professional judgement can be made on the overall significance of effects in the context of relevant RMA or policy tests. Nevertheless, a broad scale translation of effects is provided for reference.

Determining the rating to be applied is achieved through a qualitative analysis of various factors – this requiring a consideration of what factors or values are relevant to the particular assessment, what weighting should be applied to these, and what rating should be applied to each. In addition is a consideration of the interrelationship between the values, for example whether two or more factors combined result in a greater or lesser significance.

The factors or values that are considered relevant to this proposal, based on the nature of the proposal and the character and context of the site, are outlined as follows:

#### Context

- What is the extent of openness of the landscape, how vast is the viewer experience, and does the typical elevation of the viewer change this experience?
- > What is the level of modification to the site and surrounds, is it pristine forest or modified farmland?
- What is the significance of the landscape, is it considered high value and/or does it have well understood associational or cultural values?
- ▶ How unique is the landscape, does it convey a particular sense of place, is it memorable?
- What is the overall character and is the proposal consistent with this character?
- What is the ecological value and characteristic of the landscape, is there significant flora or fauna?
- What are the geomorphic values of the landform, are there significant rocky outcrops or visible processes?
- What are the transient values of the landscape, how much does it change over time (weather, fog, seasons, cropping)?

#### Viewpoint Locations

- What is the relative height of the solar panels above (or below) the viewer, including their relevant height to landscape features around them?
- Is the viewpoint location specifically orientated towards the proposal?
- Is the viewpoint location often frequented, is it a living or recreational space?
- Is the view towards the proposal clear and open, or are there intervening obstacles?
- Is the proposal in the foreground, middle-ground or background of the view?
- Will the solar panels dominate the viewer?
- ▶ Is the viewpoint part of a sequence of views, and if so is the prominence of the solar array more or less at the particular viewpoint than in other parts of the sequence?

- Will the solar panels change the composition of the view, and how might this differ during the day when panels tilt in different directions?
- Will the panels draw the attention of the viewer more than other features in the view?
- Will the panels compromise views to the landscape features or wider views in the landscape?
- Will the proposal result in modifications to the landform, change the skyline form or create exposed cut surfaces?
- Will the proposal result in the loss of vegetation or reduction in fauna habitat?
- How complex is the solar array, is its layout relatively legible or does it require viewer effort to make sense of how it works?

Translating these factors into a consideration of landscape effects, a very-high rating represents a situation where a proposal would result in direct, extensive change to landform or land-cover, and would result in changing the character of a place. It would represent an activity that is very foreign and hard to rationalise in the landscape. A very-low rating represents a situation where a proposal would have only a small impact on landform or land-cover (such as temporary works), and relates to works that are in character with the existing landscape, or share charactistics as a type of activity that already exists. Landscape effects are considered in the context of permitted activities within the relevant District Plan that have a high likelihood of occuring (or are already occuring) in the wider landscape.

In terms of visual effects, a very-high rating represents a situation where a proposal would become the key, dominating element in the primary view from a particular viewpoint, likely in the foreground, making the appreciation of other aspects of the view difficult to achieve. A very-low rating represents a situation where a proposal might be partially visible from a particular viewpoint, but it would be subservient to other aspects of the view and likely partially (or largely) obscured by foreground elements. The movement of the solar panels is an important consideration of visual effects, as the extent of visibility may differ during different times of the day.

It's important to recognise that visual effects need to be considered in terms of the whole view – during an assessment process it is easy to focus solely on the proposed site only, and not consider views in other directions which may be more interesting or captivating.

# Landscape Context

The proposed site sits on the flat plains between the Tararua Ranges and the east coast, in the southeast of the north island of New Zealand, approximately 5km south of the centre of Masterton and approximately 13km east of the Tararua Ranges in Wairarapa. SH2 runs through Masterton in a generally north-south direction.

The landform is generally flat, situated in a lowland basin extending from Mt Bruce in the north to Carterton in the south. The Tararua Ranges rise sharply to the west, providing shelter from the westerly wind and a sense of protection and orientation; the lowland basin extends out to the east coast.



The broad semi-braided Waingawa River flows east from the Tararua Ranges and, along with numerous tributarys, joins the Ruamahanga River to continue south. The Te Kāura Upper Ruamāhanga Floodplain Management Plan (FMP)<sup>2</sup> Reach 17, covers the river bed occurring from SH2 east to the confluence with the Waipoua and Ruamāhanga Rivers (running along the northern boundary of the proposed site). The FMP is focused on river maintenance with intensive implementation of (mixed species) vegetated buffers, which replaces previous practices of responding to erosion issues with machinery in the channel.

The area enjoys a mainly warm dry climate, sheltered by the Tararua Ranges. Summers are dry and mostly settled with temperatures ranging from  $20 - 28^{\circ}$ C. Winters are cool to mild, frosts are common with temperatures between 10 and 15°C. Wind can be common in Spring and Summer gathering strength coming down the Tararua Range and out to the coast. The sky is a big feature, with the Tararua Ranges dominating the western horizon.

Farming, cropping and horticultural activities along with lifestyle blocks permeate the landscape creating a constantly changing vista. The landscape is therefore transient by nature as the orchards and cropping species rotate through the seasons and associated farming machinery is often seen on the rural roads moving between locations. Mature vegetation is mainly exotic, found as shelter belts and hedge rows with an occasional remnant of native bush.

Housing density in the Masterton district is moderate, consisting of a mix of residential, lifestyle and rural properties with numerous industrial related buildings around the outskirts of the town. At the 2018 census housing density was 11,391 homes across an area of 2000km<sup>3</sup>.

The industrial area at Waingawa (west of the site and across SH2), is Wairarapa's main heavy industrial area, where large industrial activities have been co-located, this being an important resource for the Wairarapa, and consequentially for its social and economic wellbeing. A number of industrial activities occur such as a timber mill, a wool and farm supply business along with a truck stop. Industrial activities mix with consultancy services, reinforcing the eclectic nature of the area.

Ballance Agri nutrients fertiliser service centre is located at 4022 SH2, west of the proposed site, on the corner of Cornwall Road and SH2 and is not part of the proposed site.

The experience driving through the landscape is of an eclectic mix of housing, industry and farming. The Tararua Ranges are a consistent backdrop looking to the west with the open lowland basin to the east. Power lines are frequently seen across the landscape, along roads and through paddocks. Commuters, rural machinery operators, recreation seekers and industrial stock movement create a constant flow along SH2.

#### Proposed site

The proposed site is located at 51, 99 and 107 Cornwall Road - the parcels of land included in the application total 70.7ha, it has Cornwall Road to the west, SH2 to the north, the Waingawa River to the east and the

<sup>3</sup> 2018-census-place-summaries/masterton-district



Masterton Transpower Substation to the south. The overall extent of the solar farm is 25ha. The main activity on the site is grazing. Mature shelterbelts run almost contiguously along the northern and western borders of the site extents, intermittent mature hedges and vegetation run south of the proposed site. Large truck yards and shedding border the southern edge of the proposed site and sit adjacent to the Transpower Substation. There is evidence of the site being part of the broader riverbed, the soil is a mix of free-draining alluvial, poorly drained gley and recent soils typical of low-lying areas affected by an historic meandering floodplain.

Access for both construction and long term operation of the solar farm is via an exisiting crossing currently accessed via 107 Cornwall Road which then cuts through the middle of the terraced site in a generally north-south direction. To the east of the track the terrace drops down 3-4m towards a lower river terrace, dropping out of site from the surrounding roads. A second construction access track will be installed at 51 Cornwall Road, where an existing farm access and track is currently formed and will be used during the construction. Power lines cut through the site from the substation in the south, across the land in a northerly direction to SH2 and into Masterton.

#### **Biophysical Values**

The site and surrounds have generally low biophysical value due to the modified productive nature. There is likely to be some biophysical value along the Waingawa River to the north of the proposal, however it mostly consists of exotic advantageous vegetation and sparce riparian habitat.

A moderate level of modification exists along the Waingawa River in the form of vegetative flood control measures which somewhat reduce the natural values - due in part to the close proximity to Masterton along with the visible activities of gravel extraction being seen from the SH2 bridge north of the proposed site.

Greater biophysical values occur within the upper reaches of the Waingawa River and in the Tararua Ranges 13km to the west.

#### **Perceptual Qualities**

The perceptual qualities of the area include a sheltered, semi-industrial, productive rural character.

The semi-industrial character is reinforced by the busy traffic seen moving along SH2 and transitioning through the Waingawa Industrial area which sits to the south of Masterton. Multiple and eclectic buildings as well as a mixture of farming activities are scattered across the landscape.

The perception of productivity is reinforced through the range of noises, often on a cyclic and seasonal basis, from the production, manufacture, processing and/or transportation of raw materials derived from primary production and ancillary activities.

The occassional sound and view of topdressing planes from the nearby Hood Aerodrome can also be heard on a seasonal basis, strengthening the seasonal variations and perception of the productive qualities of the rural landscape.



The landscape is reasonably expansive - there is a big sky with long views from countryside locations, the visual focus closes in with relative proximity to Masterton, where built structure and shelterbelts become more dominant; the Tararua Ranges provide a constant sheltering quality across the landscape.

A transient nature is associated with the movement of grazing animals across the landscape, farming machinery seasonally moving to new sites and the seasonal changes of vegetation along the river corridor.

#### **Associational Qualities**

There is likely to be a cultural association within the broader landscape in relation to Mahinga Kai areas in the Tararua Ranges and the larger rivers.

Historial family connections to the broader landscape may exist, indeed many streets in Masterton are named after early settlers. Desktop analysis does not reveal any significant associations with the proposed site.

## **Policy Context**

Located at 51, 99 and 107 Cornwall Road, (Lot 2 DP 325931, Lot 1 DP 75496 and Lot 2 DP 88515) the site is zoned Special Rural Zone under the Operative Wairarapa Combined District Plan ("the Plan"). This zone extends across the majority of the landscape beyond the site, and is a typical rural zone which, shaped by the various forms of primary production, provides for activities that support primary production, and other activities that have a functional need or operational need to be located within the Rural Zone.

The rural environment is typically characterised by:

- > Open space, natural landscapes and vegetation predominating over the built environment;
- Working productive landscapes with a wide range of agricultural, horticultural and forestry purposes;
- Large areas of exotic and indigenous vegetation;
- A range of built forms;
- Place where people live and work, with low population density;
- Road networking ranging from unsealed local roads to busy State Highways;
- Allotments self-serviced in terms of water supply and wastewater disposal.

There is a recognition (Significant Resource Management Issue 4.2.11) that renewable energy generation facilities are to be located in the rural environment because of their land area and siting requirements.

As stated in the Wairarapa Combined District Plan (Part B – District Wide Issues), in the Rural (Special) Zone the standards provide for less intensive subdivision than in the Rural Zone, recognising the special attributes and constraints of this zone, including:

Significant risks from natural hazards, particularly flooding;

- The operational requirements of significant land use assets, such as Hood Aerodrome, Waingawa Industrial Area, public wastewater treatment and landfill facilities, water supply catchments, and intensive horticultural activities;
- > Potential cumulative effects of effluent disposal in areas of high ground water levels;
- Urban growth management, particularly where ad hoc development may lead to pressures on roading and servicing; and
- Areas of unique and special rural character that would be degraded by the cumulative effects of intensive development.

These factore are cumulative in that, generally, the land included within the Rural (Special) Zone has more than one of these characteristics.

Objective 4.3.1 - Protection of Rural Character and Amenity aims to maintain and enhance 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. Policy 4.3.2(e) seeks to manage subdivision, use and development in a manner which recognises the attributes that contribute to rural character including the typical characterisations identified above.

It is considered that the proposed solar farm represents and responds to the character and amenity of the site and surrounds and is consistent with Objective 4.3.1 and Policy 4.3.2(e).

Objective 9.3.1 aims to identify and protect Wairarapa's outstanding landscapes and natural features from the adverse effects of inappropriate subdivision, use and development. Policy 9.3.2(g) directs that subdivision and development is managed by having regard to the adverse effects on the landscape values of the site and locality.

Bordering the east of the site is a Natural Open Space Zone, north of SH2 is a reasonably large General Industrial Zone, across the river are the General Residential and Mixed-Use Zones.

The Flood Hazard Area, which restricts activity for earthworks and non-habitable structures (Rule 21.4.7) extends from the river across to the eastern terrace of the site.

Restricted activity under the High Voltage Transmission Line overlay (Rule21.4.9) translates to a 20m buffer either side of the transmission line which runs in a generally north-south direction through the centre of the site.

There are no Outstanding Natural Landscapes, Features or recorded Archaeological Sites indicated close to the site. The closest being the Tararua Ranges approximately 20km to the southwest.

### Proposal

The proposed site is located at 51, 99 and 107 Cornwall Road, the extent of the solar farm covering approximately 25ha, in short, the proposal includes:

- 25,000 35,000 solar panels approximately 2.5m in height x 1.1m wide and with a total maximum height of up to 4m from existing ground height;
- Single axis trackers support the solar panels;

- Power conversion units (PCUs) skid mounted on the same footprint (3mW x 12mL and 3mH);
- A Site Compound comprising maintenance and storage buildings (likely converted shipping containers), 5,000-10,000L water tank, on-site carparks and loading areas; and
- Approximately 1300m of internal roads at roughly 4m wide (roughly 5,000m2 of internal roading).

Further details can be found in the AEE and on the engineering plans provided by Cameron Fauvel Projects, reference 23048-EW1.

Retention of the existing vegetation is integral to the design. This includes the retention of the existing shelterbelt which runs almost continuously along the western border of the proposed site. Another hedgerow exists which runs parallel to SH2 along the northern border of the proposed site offering a screen between travellers along SH2 and the proposed site. No additional visual mitigation is proposed.

# Assessment

#### Landscape Effects

The proposal will result in a change in landscape character by introducing a reasonably large amount of built form, resulting in a unique element in the wider rural landscape.

However, this unique element is not necessarily an adverse or inappropriate change. As described earlier in this report, the wider landscape is already modified with a mixture of housing, industry and farming. Vegetation across the plains is mostly exotic in the form of pasture and exotic shelterbelts. Landforms are largely modified including rivers which are flanked by exotic flood control vegetation. Built forms in the area include farm associated buildings, industrial warehouses and factories, lifestyle, farming, and residential houses as well as the adjacent Transpower substation with numerous overhead lines.

Conceptually, the proposed solar farm represents an additional type of production activity with associated built form and electrical infrastructure, and can be considered to be best placed in the rural environment with other farming activities rather than in residential, commercial or industrial areas. However, rather than drawing from the land and soil for productive use, this proposal draws from the sky and climate – an integral element of this landscape.

Much like the surrounding activity, the solar farm specialises in its task. The grid-arrangement of the solar panels is not unlike the organisation of farm paddocks on a broad scale, both looking to optimise the methods of achieving the best yield from the land. Similarly, the existing fences within the site are arranged to achieve efficient access via the modified form of the farm tracks. These are not natural patterns; they represent ways in which people have manipulated the landscape resource to maximise productivity creating a patchwork of rural activities.

The difference is that the solar farm will change the undeveloped nature of the site by introducing a different built form. By retaining pasture beneath the panels it allows retention of some of the pastoral character which will then be maintained using sheep grazing. The inclusion of sheep grazing further strengthening the pastoral character of the farm.

#### Effects on Biophysical Values

It is unlikely the proposal will have any effects on the biophysical values of the site, as mentioned the biophysical values are generally low due to the modified productive nature of the site. No physical changes are proposed to the riparian corridor of the river as this is beyond the site boundary.

#### Effects on Perceptual Values

In many respects, the degree of impact on perceptual values is linked to how much the proposal will be visible. In this regard, it is largely screened from both public and private viewpoints (as will be further outlined below), with only limited snapshots through gaps in existing hedgerows.

Although screening the remaining small open sections of the boundary with vegetation in order to completely hide away all the built forms could technically be possible, such an approach is not considered necessary given the context. As identified, there are only a couple of locations where such snapshots are possible, in the context of a much wider outlook that contains a wide range of other built forms. In reality, the solar farm will be relatively difficult to see and unlikely to be a focal point (as explored later in this report). The ancillary buildings will also be relatively insignificant to the whole development, and in character with the perception of a productive, semi-industrial landscape. The site compound will not be visually dominant – being located at least 225m from Cornwall Road; placement of the PCU will be at an even greater distance from the road and although a kiosk is to be positioned at the frontage of Cornwall Road it would be no more visually dominant than any other electrical equipment building associated with a network utility.

The proposed perimeter deer fencing will have a rural character. Although deer fencing is not common in the surrounding landscape its construction is a permitted activity. Electrical hazard signage is required, the actual design, confirmed through detailed design to meet Health and Safety requirements is not considered to be a significant element.

Given the location of the proposal in an already modified area of rural landscape, adjacent to industrial activity and largely screened from surrounding viewpoints, it is considered that its effect on perceptual values will be *low*.

#### Effects on Associational Values

Historical and cultural connections to the site have not been revealed and therefore it is considered that effects on associational values will be **very low**.

#### **Overall Landscape Effects**

As outlined in the following section, the solar farm will be very difficult to see from beyond the site, confined by the existing surrounding topography and shelter belts. Whilst it represents a change in the activity and character of the site and will be perceived as different and potentially unique for the area, it is located in a productive, semi-industrial landscape that has been highly modified to achieve optimised production. At its core, it is no different to other productive activity, utilising the environmental resource as efficiently as possible, and the retention of pasture under the panels helps retain a pastoral connection. Overall the landscape effects are therefore consider to be *low*.



# **Visual Effects**

Despite the wider landscape having a generally open landscape character, views of the site itself are mostly restricted. The low height of the panels means the site is only likely to be visible in limited brief, fleeting glimpses from the road corridors. There may also be some snapshots of the site in wider, more expansive views – such as looking south from State Highway 2 coming across the bridge over the Waingawa River or looking north from the northern extents of Hughes Line where it enters the Waingawa River to the Tararua Ranges. For the casual traveller, this represents a small portion of a wider journey across the landscape that takes in other productive rural, semi-industrial land uses and outward views. Additionally, sections across the Waingawa River off Solway Crescent may experience glimpses of the site although there is established vegetation on both sides of the river significantly reducing visibility.

The following section provides an assessment of specific views within this viewing catchment. It refers to two visualisations that have been prepared (Locations 1 & 6) and a series of photographs from around the site. Two locations were selected for the visualisations – these being publicly accessible locations to the west of the proposal, one on the northwestern boundary and one on the southern corner. The visualisations are intended to be a tool for understanding the overall visual character of the proposal and should be read in conjunction with the commentary below.

The table below provides an assessment of visual effects from neighbouring residential properties. Further assessment of the effects on rural and industrial properties is outlined below.

Property	Assessment of Visual Effects	Rating
3954A SH2	This property sits approximately 200m west of the	n/a
	western boundary of the site. There are no dwellings on	
	this property.	
107 Cornwall Road	This property sits approximately 120m southeast of the	Very-Low
	southern corner of the site. The dwelling on this property	
	is sheltered by mature vegetation on the north, south, and	
	west with open views across the landscape towards the	
	east. A mature shelterbelt runs inside the boundary of a	
	neighbouring property to the north which would inhibit	
	views of the solar farm.	
113/131 Cornwall	This property contains the Transpower Substation and is	n/a
Road	listed as one single property on the Carterton District	
	Council Website. It does not contain a dwelling. Due to	
	the nature of this activity, the potential visual effects have	
	not been assessed.	



573 Hughes Line	This property sits approximately 470m southeast of the nearest solar panel. Various industrial buildings sit between the dwelling and the site. Additionally, various existing mature and semi-mature vegetation sits between the dwelling and the site which would largely obscure the site, therefore there will be minimal, if any views of the solar farm.	Very-Low
580 Hughes Line	This property sits approximately 525m southeast of the nearest solar panel. The dwelling sits behind an existing mature shelterbelt which runs along the northwest boundary of the property on Hughes Line. The shelterbelt provides screening between the dwelling and the site therefore there will be minimal if any views of the solar farm.	Very-Low
577 Hughes Line	This property sits approximately 470m south of the closest solar panel. The dwelling sits to the south of the site and various industrial buildings sit between the dwelling and the site, additionally various existing mature and semi- mature vegetation sits between the dwelling and the site therefore there will be very limited views of the solar farm if any.	Very-Low
593 Hughes Line	This property is spread across two parcels, one sitting on the northern boundary of the site and adjacent to SH2, the other sitting adjacent to the southeast corner of the site, neither of which have dwellings on them.	n/a

#### Dwellings on Solway Crescent

Dwellings on Solway Crescent are located north of the site and across the Waingawa River. With built forms and/or mature exotic vegetation providing a visual barrier between these residents and the solar farm, it is likely dwellings will see only small glimpses of the proposal. Long views to the dominant Tararua Ranges and short views across the nearby rural pasture will still be possible. Overall, it is concluded visual effects from dwellings on Solway Crescent will be very-low.

#### **Industrial Properties**

Industrial properties sitting on the opposite side of the road from the site on State Highway 2 are situated behind substantial earth bunds which are then planted up with a variety of vegetation effectively screening the properties from the site. Key properties include JNL Timber Mill, Higgins Contractors, along with a farm supplies site and various rural support industries. There are likely to be limited, if any views of the site from these industrial properties.



Another two industrial properties boundary the northwest and north corners of the site at 4022 SH2 and 4082 SH2 respectively with either mature vegetation or numerous buildings screening direct views to the proposed site. There are no dwellings on these sites with one being a landscape materials production and supply yard, the other being a fertiliser service centre. Individuals working here are likely to be focused on the daily tasks at hand. Short views of any amenity landscape, trees and other buildings would likely draw the attention of the viewer, along with any views north and west to the Tararua Ranges. It is likely there are limited, if any views of the site from these commercial properties.

Visual effects from these locations are considered to derive directly from the landscape effects outlined above, a separate assessment of visual effects from commercial sites has not been undertaken.

#### **Views from Farmland**

There will be various oblique glimpses of the proposal from the productive open landscape around the site, including immediate neighbours. People within such properties may be working, focused on their own activities more than the surrounding view. Long views north and west to the Tararua Ranges and surrounding countryside will remain unaffected. Any glimpses of the proposed site would be relatively small within the context of the wider landscape. Therefore, visual effects from such locations are considered to derive directly from the landscape effects outlined above – relating to a change in landscape character and activity. Overall, it is considered that visual effects from farmland will be low to very low.

#### **Public Views**

The key public views of the proposal will be from the immediately surrounding road network. This includes:

- Approximately 0.5km north of the Cornwall/SH2 intersection
- Approximately 0.7km south of the Cornwall/SH2 intersection
- Approximately 0.8km east along Hughes line, just before access to the river

There are few, if any particular locations where the whole extent of the solar farm would be apparent. From road level, as the visualisations show, only the first few rows of panels are visible. For most vehicle trips, the solar farm will be a small part of an extended experience through the wider landscape.

As outlined earlier the extent of change relates to the change in landscape character and the introduction of built form. Full screening of the proposal was not considered necessary, the level of landscape effects was considered acceptable. The existing mature shelterbelts will provide initial screening of the site and over time it will become part of the wider productive landscape.

It is therefore considered that from a public viewing experience, visual effects will be *low*. The proposal is not located in any significant views or viewshafts and will be generally seen as part of a wider transient experience across the landscape.

#### **Overall Assessment of Visual Effects**

Within the broader landscape there are no particularly special or noteworthy views which the solar farm would screen, views to the wider landscape looking away from the proposal will still be possible.

There are no residential dwellings who will experience views directly toward the solar farm therefore there are no properties which will experience visual effects. However, there will be glimpses from nearby roads of sections of the solar farm.

It is therefore concluded that the visual effects of the proposal will be *low* to *very-low*.

## Conclusion

This report has provided a landscape and visual effects assessment of the proposed solar farm to be located on 51, 99 and 107 Cornwall Road, approximately 5km south of Masterton and approximately 13km east of the Tararua Ranges. The solar farm is estimated to generate up to 12.5MW (AC) of electricity.

It is considered that the landscape effects of the proposal will be *low*. The solar farm will be somewhat different within the rural character bordering the south and west of the site, however, the solar farm is considered to be a productive activity, utilising the rural environment within a highly modified productive rural environment. The site will not be dissimilar to the eclectic mix of activities found across the peri-urban environment to the north and east of the site.

Views of the site itself are relatively restricted. Existing mature shelter belts provide screening for the majority of the proposal leaving only fleeting glimpses of the site for the casual traveller along SH2 or Cornwall Road representing a small portion of a wider journey across the landscape.

For dwellings in the immediate and more distant locality, visual effects are considered to be *low* to *very-low*. Oblique views, existing screening by foreground elements and the visually dominant Tararua Ranges will likely result in the panels being a small portion (if seen at all) of the general outlook from these properties.

Overall, it is concluded that although the solar farm will result in a change in landscape character, it is a productive activity within a highly modified productive landscape. The landscape and visual effects are considered to be, at most, *low* which can be considered to be *less than minor*.

Alexia Hamelink Landscape Architect

Shannon Bray Registered Landscape Architect



# Landscape & Visual Effects Assessment Maps & Photographs

# Proposed Solar Farm Cornwall Road Masterton

Prepared for:

**Masterton Solar Farm Limited** 

April 2024





#### LEGEND:

Extent of Solar Farm

X Residential Dwellings

0 Photograph Locations

X Visual Simulation Point

Imagery & Property Parcels sourced from LINZ July 2023

For a detailed site layout refer to engineering plans prepared by Cameron Fauvel Projects Reference 23048-EW1.

# **Context Map**

Proposed Solar Farm Cornwall Road Masterton

Prepared for: Masterton Solar Farm Limited

#### FOR ISSUE

12 February 2024Drawn: A HamelinkRevision 01Checked: S Bray

Scale: 1:15,000 Print at A3

W

Sheet 01

MastertonSolar\_GraphicAttachment\_24-04-08

www.wayfinder.nz shannon@wayfinder.nz

YFINDER



LOCATION 1: VIEW OF SITE FROM SH2 (REF 027)



LOCATION 2: VIEW OF SITE FROM SOUTH (TRUCK YARD) (REF 005)

#### Images taken with iPhone 14 Pro 20th June 2023 between 3pm and 5pm

Photograph 1&2 Details: Date: 20 June 2023 Camera: Apple iPhone 14 Pro Focal Length: 24mm Equivalent Reading distance: 467mm

# Site & Context Photographs 1 & 2

Proposed Solar Farm Cornwall Road Masterton

Prepared for: **Masterton Solar Farm** Limited

#### FOR ISSUE

12 February 2024 Drawn: A Hamelink Revision 01 Checked: S Bray

Scale: n/a Print at A3

W

# Sheet 02

MastertonSolar\_GraphicAttachment\_24-04-08

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YFINDER



LOCATION 3: INTERNAL VIEW OF SITE (REF 009)



LOCATION 4: INTERNAL VIEW OF SITE (REF 024)



Photograph 3 Details: Date: 20 June 2023 Camera: Apple iPhone 14 Pro Focal Length: 24mm Equivalent Reading distance: 467mM

Photograph 4 Details: Date: 20 June 2023 Camera: Apple iPhone 14 Pro Focal Length: 14mm Equivalent Reading distance: 272mm



Proposed Solar Farm Cornwall Road Masterton

Prepared for: **Masterton Solar Farm** Limited

#### FOR ISSUE

12 February 2024 Drawn: A Hamelink Revision 01 Checked: S Bray

Scale: n/a Print at A3

W

Sheet 03

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YFINDER



LOCATION 5: INTERNAL VIEW OF SITE (REF 011)



LOCATION 6: VIEW OF SITE FROM CORNWALL ROAD (REF 022)

#### Images taken with iPhone 14 Pro 20th June 2023 between 3pm and 5pm

Photograph 5 Details: Date: 20 June 2023 Camera: Apple iPhone 14 Pro Focal Length: 14mm Equivalent Reading distance: 272mm

Photograph 6 Details: Date: 20 June 2023 Camera: Apple iPhone 14 Pro Focal Length: 24mm Equivalent Reading distance: 467mm

# Site & Context Photographs 5 & 6

Proposed Solar Farm Cornwall Road Masterton

#### Prepared for: **Masterton Solar Farm** Limited

#### FOR ISSUE

12 February 2024 Drawn: A Hamelink Revision 01 Checked: S Bray

Scale: n/a Print at A3 Sheet 04

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LOCATION 7: VIEW OF NEARBY DWELLINGS LOCATED ON HUGHES LINE (REF 016)



LOCATION 8: VIEW OF NEARBY DWELLINGS LOCATED ON HUGHES LINE (GOOGLE STREET VIEW IMAGE)



#### Images taken with iPhone 14 Pro 20th June 2023 between 3pm and 5pm

Photograph Details: Date: 20 June 2023 - 3:45pm Camera: Apple iPhone 14 Pro Focal Length: 48mm Equivalent Reading distance: 933mm

# Site & Context Photographs 7 & 8

Proposed Solar Farm Cornwall Road Masterton

Prepared for: **Masterton Solar Farm** Limited

#### FOR ISSUE

12 February 2024 Drawn: A Hamelink Revision 01 Checked: S Bray

Scale: n/a Print at A3

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Sheet 05

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YFINDER







Photograph Details: Date: 20 June 2023 - 3:45pm Camera: Apple iPhone 14 Pro Focal Length: 24mm Equivalent Reading distance: 467mm

# Location 1 Existing photo

Proposed Solar Farm Cornwall Road Masterton

Prepared for: Masterton Solar Farm Limited

#### FOR ISSUE

12 February 2024Drawn: A HamelinkRevision 01Checked: S Bray

Scale: n/a Print at A3 Sheet 06

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Photograph Details: Date: 20 June 2023 - 3:45pm Camera: Apple iPhone 14 Pro Focal Lenght: 24mm Equivalent Reading distance: 467mm

Note: This Visualisation is a technical representation that demonstrates the proposed Solar farm in its proposed location at the correct scale, based in information provided. It does not represent an assessment of effects.

# Location 1 Visual Simulation

Proposed Solar Farm Cornwall Road Masterton

#### Prepared for: Masterton Solar Farm Limited

#### FOR ISSUE

12 February 2024Drawn: A HamelinkRevision 01Checked: S Bray

Scale: n/a Print at A3 Sheet 07

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Photograph Details: Date: 20 June 2023 - 3:42pm Camera: Apple iPhone 14 Pro Focal Lenght: 24mm Equivalent Reading distance: 467mm

# Location 6 Existing photo

Proposed Solar Farm Cornwall Road Masterton

Prepared for: Masterton Solar Farm Limited

#### FOR ISSUE

12 February 2024Drawn: A HamelinkRevision 01Checked: S Bray

Scale: n/a Print at A3 Sheet 08

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Photograph Details: Date: 20 June 2023 - 3:42pm Camera: Apple iPhone 14 Pro Focal Lenght: 24mm Equivalent Reading distance: 467mm

Note: This Visualisation is a technical representation that demonstrates the proposed Solar farm in its proposed location at the correct scale, based in information provided. It does not represent an assessment of effects.

# Location 6 Visual Simulation

Proposed Solar Farm Cornwall Road Masterton

#### Prepared for: Masterton Solar Farm Limited

#### FOR ISSUE

12 February 2024Drawn: A HamelinkRevision 01Checked: S Bray

Scale: n/a Print at A3 Sheet 09

MastertonSolar\_GraphicAttachment\_24-04-08

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WAYFINDER



ECC: Transportation Assessment Report (TAR)



East Cape Consulting Limited

Claire Price Stradegy Planning Limited PO Box 239 NAPIER 4140



Issued via email: Claire@stradegy.co.nz

Dear Claire

#### PROPOSED SOLAR FARM - 51 CORNWALL BOAD, MASTERTON

East Cape Consulting (ECC) has been engaged by Masterton Solar Farm Ltd (the Applicant) to provide traffic advice and prepare a Transportation Assessment Report (TAR) for the above project.

The following report describes the existing transport environment surrounding the site, assesses the potential effects of the activity and identifies required mitigation measures and conditions.

By way of summary, it is concluded that subject to conditions recommending a Construction Traffic Management Plan (CTMP) and detailed design approval for the temporary construction access, the activity can be appropriately integrated with the surrounding transport network.

#### 1. SITE LOCATION

The subject site is located at 51, 99 and 107 Cornwall Road, to the south of Masterton in the Carterton District. The site location is shown as Figure 1.





Figure 1 – Site Location (Base Map Source: Openstreetmaps)

The site is legally described as:

- 51 Cornwall Road, Lot 2 DP 325931 PT SEC 364 Taratahi Plan BLK VIII Tiffin SD, 58.0435, CT 17C/295 104927;
- 99 Cornwall Road, Lot 1 DP 75496, 10.01ha, CT 42D/409; and
- 107 Cornwall Road, Lot 2 DP 88515 BLK VIII TIFFIN SD, CT 56B/59.

The site has frontage to Cornwall Road and adjoins a Transpower substation to the south as shown on Figure 2 below.

23-0119 Masterton 240412.docx





Figure 2 – Local Context (Aerial Source: Google Earth Pro)

High voltage power lines, associated with the substation and the National Grid corridor traverse the site. These can be seen earlier on Figure 1. A rural contracting business also operates to the south of the site, with access to Cornwall Road and Hughes Line.

The site and surrounding area are zoned Special Rural by the Wairarapa Combined District Plan (WCDP). The surrounding land uses include rural and rural residential activities.

#### 2. EXISTING TRANSPORT NETWORK

#### 2.1 Road Hierarchy

The strategic road network in the vicinity of the site is provided by State Highway 2 (SH2) which connections south through the Wairarapa and Wellington, and north towards Hawkes Bay. SH2 is managed by Waka Kotahi.

Cornwall Road meets SH2 at a crossroad intersection with Norfolk Road forming the north-western leg. Cornwall Road is classified<sup>1</sup> as a secondary collector road. Norfolk Road is classified as a primary collector road. Both roads are managed by Carterton District Council (CDC).

Hughes Line is also a Council road. It is classified as a low volume road on the eastern side of Cornwall Road and an access road on the western side.

The road hierarchy provided for in the Proposed WCDP, classifies SH2 as an Interregional Connector, Norfolk Road is a Stopping Place, Cornwall Road is a Rural Connector and Hughes Line is a Rural Road.

<sup>1</sup> Using the One Network Road Classification (ONRC) categories given in Mobileroad.org.





The site is surrounded by farmland with access to Cornwall Road only. Along this frontage, Cornwall Road provides one traffic lane in each direction. The sealed carriageway is approximately 6.5m wide and has no road markings other than at intersections. The posted speed limit is 100km/h.

The vertical alignment is straight and flat, overhead power lines have been erected along both sides and the Taratahi Water-race follows the north-east (site) side of Cornwall Road.

Views of Cornwall Road are shown as Figure 3, Figure 4 and Figure 5 below.



Figure 3 – Cornwall Road looking north-west (#107 on right)



Figure 4 – Cornwall Road looking south-east (#51 on left)

23-0119 Masterton 240412.docx





Figure 5 – Cornwall Road, Taratahi Water-Race looking north-west

The contracting business has an access along its northern boundary (near the southern boundary of the subject site) as shown on Figure 6 below. The substation has a wide sealed shoulder (approximately 75m long) along its frontage which accommodates (unmarked) parking, and access to three gated vehicle access points.

Unsealed shoulder widening (approximately 45m long and 4.5m wide) has been constructed opposite the contractor access as shown by Figure 3 (left side). This provides an overrun area to enable large vehicles to turn to/from the access in one manoeuvre.

The various features of the area are shown as Figure 6.





Figure 6 – Cornwall Road Frontage

The intersection of Cornwall Road and Hughes Line is also a crossroad intersection. It is controlled by Give Way signs on both Hughes Line approaches.

The Cornwall Road/SH2/Norfolk Road intersection has recently been upgraded to a roundabout from a Stop-controlled crossroad intersection as described later in Section 3.

#### 2.3 Traffic Volumes

The Mobileroad website, which sources data from Council asset management databases, gives the following average daily traffic volumes (in vehicles per day, vpd, two-way) for Council roads around the site:

Cornwall Road, south of SH2	369 vpd (16% HCV)
Cornwall Road, south of Hughes Line	277 vpd (12% HCV)
Hughes Line, east of Cornwall Road	43 vpd (8% HCV)
Hughes Line, west of Cornwall Road	957 vpd (12% HCV)

Data published by Waka Kotahi<sup>2</sup> show in 2020, SH2 carried some 14,570 vpd (6% HCV) at the site south of the Waingawa Bridge.

No other data is available for this site (2016-2019) however review of the last five years of data at the two nearest sites on SH2 shows growth rates of 1-2% per annum.

<sup>2</sup> In the most recently available AADT book 2016-2020



# area.

#### 2.4 Road Safety

The Waka Kotahi Crash Analysis System (CAS) was used to review the road safety history of the area. The search included Cornwall Road from SH2 to Hughes Line, inclusive of both intersections (a length of approximately 1.4km). The search covered the five-year period 2019 to 2023 (inclusive) as well as any data from 2024.

A total of 13 crashes were reported. All of these occurred within 50m of the SH2/Norfolk Road/Cornwall Road intersection. No crashes were reported at the Cornwall Road/Hughes Line intersection or elsewhere on the reviewed section of Cornwall Road.

The intersection crashes included one serious, four minor and eight non-injury crashes. The nature and causes of the crashes were mixed. The most common causative factor was failure to give way, with restricted visibility noted in some cases. Three loss of control incidents were reported, as well as one rear end crash and one merging incident. Driver impairment or inexperience was noted in two crashes.

Safety issues at this intersection have been recognised by Waka Kotahi and a new intersection layout (roundabout) recently construction, as described in Section 3 below.

Elsewhere along Cornwall Road the crash history does not point to any evident existing safety concerns.

#### 3. FUTURE TRANSPORT NETWORK

Waka Kotahi has recently completed an upgrade of the SH2/Cornwall Road/Norfolk Road intersection to a roundabout. Works were nearing completion at the time of ECC's site visit in August 2023. This project is part of a wider package of safety works on SH2 between Masterton and Carterton<sup>3</sup>.

An overall view of the corridor works, and an indicative layout of the roundabout are shown as Figure 7, Figure 8 and Figure 9 below.

<sup>3</sup> Information and Figures sourced from www.nzta.govt.nz/projects/sh2-wairarapa-highwayimprovements/roundabouts-and-barriers/





Figure 7 – SH2 Safety Works (Source: Waka Kotahi)



Figure 8 – SH2/Norfolk Road/Cornwall Road Roundabout (Source Waka Kotahi)







Figure 9 – SH2/Norfolk Road/Cornwall Road Roundabout looking south-east from Norfolk Road

The works also include a central median barrier and removal of the existing southbound passing lane on SH2.

#### 4. PROPOSAL

#### 4.1 Proposed Activity

The spatial extent of the solar farm is approximately 25ha in area, and this area will be occupied by solar arrays (solar panels and trackers). The solar panels (approximately 1.1m wide and 2.5m in height) are comprised of polycrystalline or monocrystalline silicon wafer cells. The combined height of the panels and tracking system will not exceed 4m from existing ground level when the panels are tilted at their maximum angle. Depending on the power rating of each solar panel, the number of panels could range between 25,000 – 35,000.

The scale and form of the proposed solar farm includes the structures, facilities and ancillary activities described below and described in full in the resource consent application and includes:

- A site compound (a level metalled area);
- Grid connection point circuit breaker kiosk building;
- Solar panels mounted on a single axis tracking system;
- Power Conversion Units (PCUs);

Electrical equipment including cabling installed above and below ground;

The use of an existing vehicle access at 107 Cornwall Road, for short term construction (oneway entry) and long-term maintenance (two-way) access;

The use of an existing vehicle access at 51 Cornwall Road, for short term construction (one-way exit) access; and



Internal roads.

Internal vehicle access will be enabled by an estimated 1.3km of unsealed access tracks that are typically 4m wide.

The proposed solar farm will be an unmanned operation therefore no site office or staff facilities are required. Maintenance staff will arrive and depart on weekdays, as required, but not remain on site for extended periods of time. The proposed Solar Farm layout is shown as Figure 10 below.



Figure 10 – Site Layout and Access Locations (Source: Cameron Fauvel Projects Limited)

#### 4.2 Proposed Access

Figure 6 and Figure 10 show two existing accesses along\_Cornwall Road which will be utilised by the development. Figure 3 shows the existing contractor access at 107 Cornwall Road (on the right), adjacent to the Transpower substation. Approximately 570m north-west is an existing gateway to 51 Cornwall Road (adjacent to Figure 4, on the left).

Permanent operational access will be shared with the existing contractor access.

The existing access layout has been checked with a 19m semi-trailer tracking<sup>4</sup> as a worst-case scenario (see Figure 11). This size vehicle will only visit the site for major repairs or equipment replacement post construction. Given the infrequent nature of heavy vehicle demands, it is appropriate that the vehicle be allowed to sweep across the full width of the road and the access as required. If two opposing semi-trailers meet at the access simultaneously the exiting truck gives-way to the entering truck approximately 15m from the site boundary (as currently occurs).



<sup>&</sup>lt;sup>4</sup> Defined by RTS18; Roads and Traffic Guidelines 18 – New Zealand on-road tracking curves for heavy motor vehicles.



Figure 11 – Existing Access Entry Tracking (#107)

The combination of operational traffic movements and passing traffic on Cornwall Road does not warrant any widening, other than what is already provided.

<u>Temporary construction access</u> will utilise both accesses described above via a one-way circulation route where vehicles will enter at 107 Cornwall Road and exit at 51 Cornwall Road. Heavy vehicles are expected to perform right-out manoeuvres to/from SH2, whereas light vehicles (including utility vehicles and vans) can execute all movements.

The existing culvert at 51 Cornwall Road is wide enough to accommodate the swept path of an exiting semi-trailer however, some access widening is required (see Figure 12).



Figure 12 – Existing Access Exit Tracking (#51)

The WCDP refers to RTS6 (Roads and Traffic Standard 6 – Guidelines for visibility at driveways) for sight distance requirements at private accesses. RTS6 indicates that a low volume driveway (<200



vpd<sup>5</sup>) on a collector road with a posted speed limit<sup>6</sup> of 100 km/h requires 210m of sight distance in both directions. This can be provided at multiple points, including these existing access locations, along the frontage (as previously shown by Figure 3 and Figure 4).

All accesses require a 6m-by-6m triangle, on each side, to be kept clear of obstructions higher than 1m (in accordance with Figure 32.1 of the WCDP).

A heavy commercial access on a collector road should generally be formed in accordance with Figure 32.2<sup>7</sup> (of the WCDP) however, in this case a modified layout is recommended in each location as shown by Figure 11 and Figure 12.

The detailed design of the construction access will be confirmed in the CTMP, it is likely to include warning signs and may recommend temporary speed reduction to advise other drivers of slowing / turning vehicles.

To ensure the entry access at 107 Cornwall Road continues to operate safely during construction it is recommended a give-way sign is erected at this position (15m within the site). The sub-plate "to entering vehicles" may be added to clarify the intention of this positioning.

#### 5. TRAFFIC GENERATION

#### 5.1 Operational Traffic

Once operational, the activity is expected to generate a minimal number of traffic movements. Between two and four vehicle movements per day (vpd) could be generated by staff coming and going.

There could also be a small number of light vehicle trips associated with maintenance and operational needs. The need for heavy vehicles to access the site would be infrequent and typically associated with major repairs or equipment replacement.

Overall, operational trip generation is expected to be less than 10 vpd, with little to no activity on weekends.

#### 5.2 Construction Traffic

Construction of the solar farm is expected to take approximately 12 months. This includes an estimated nine-month period for material delivery and installation and six months for testing and commissioning, with a three month overlap between phases.

The workforce is expected to peak at up to 100 people on site with up to six heavy vehicles visiting the site each day (making 12 heavy vehicle movements each day).

During construction, the following facilities and infrastructure are expected to be established on site:

Temporary buildings to house a site office and staff amenities.

Temporary carparking areas and access tracks; and

<sup>7</sup> Rural Vehicle Crossing and Frontage Road Seal Widening Type B (with 15m radii on either side)



<sup>&</sup>lt;sup>5</sup> See Section 5.2 of this report.

<sup>&</sup>lt;sup>6</sup> In accordance with the notes under Table 1 of RTS6 the posted speed limit plus 15% has been used (115km/h) as no speed survey data is available.
Construction laydown and material storage areas.

The largest type of vehicle expected on site would be a 19m semi-trailer delivering containers. No over-dimension or oversize vehicles are anticipated to be required.

The site is approximately 9km from central Masterton and 11km from Carterton. The townships of Featherston, Greytown and Martinborough are also within 40km (around a 30-minute drive). The construction workforce could be drawn from these and other areas. It is expected that some workers may travel independently by car and others will travel together in light vehicles and potentially vans.

If it is assumed that each vehicle coming to site carries an average of two workers, the activity could generate some 50 movements inbound in the morning and 50 movements outbound in the afternoon. Combined with the expected peak daily heavy vehicle volume, this equates to some 112 vpd.

The appropriate mechanism for detailing construction activities and managing construction effects is a CTMP. This should be prepared by the Applicant and/or its Contractor and be subject to Council approval. This could be included as a condition of consent.

#### 5.3 Traffic Distribution

During the construction and operational phases, it is expected that the majority of traffic movements will be made to and from SH2. Some vehicles may use Hughes Line (south of Cornwall Road) and other local roads in this area if they are travelling to and from areas to the south-east.

#### 6. ASSESSMENT OF EFFECTS

#### 6.1 Construction

The activity is expected to generate up to 112 vpd when the peak workforce is on site. The movements, which would be mostly concentrated into a morning peak arrival period and an evening peak departure period, are expected to travel predominantly to and from SH2.

Cornwall Road is currently carrying a low volume of no more than 400 vpd which is well within the carrying capacity of a two-way two-lane rural road. The addition of 112 vpd is not expected to generate any operational or safety related issues.

The SH2/Norfolk Road/Cornwall Road roundabout is expected to be fully operational by the time the proposed solar farm is generating construction movements. This upgrade addresses existing safety issues at the intersection and provides more capacity, particularly for sideroad movements. On this basis, the intersection is expected to have ample capacity to accommodate construction traffic movements generated by the site.

Local to the site, construction effects including the movement of vehicles to and from Cornwall Road is proposed to be managed by a CTMP. This will be subject to approval by CDC and is the appropriate mechanism to manage construction related effects.



#### 6.2 Operational

During the operational phase the activity is expected to have up to an average of 1-2 people on site, generating 2-4 vpd if they travel independently by car. The existing contractor access on Cornwall Road complies with minimum safety standards and the impact of these additional movements is not likely to be perceptible on the surrounding road network.

#### 6.3 Road Safety

The CAS search described at Section 2.4 does not indicate any underlying issues beyond those that have already been addressed by Waka Kotahi on SH2.

The permanent access to the site, which is also to be used during construction, can meet the relevant sight distance guidelines.

Overall, the proposed activity is expected to integrate with the surrounding network, without adversely affecting the safety performance of the area.

#### 7. DISTRICT PLAN

Table 1 summarises compliance with Section 4(i), Section 21.1.25 and Appendix 5 of the WCDP.

Rule	Required	Commentary		
4.5.2	Standards for Permitted Activities (Rural Zone)			
(i) 21.1.25	Roads, Access, Parking and Loading Areas         i.       Compliance with the standards in Appendix 5         requirements for Roads, Access, Parking and Loading.         ii.       One vehicle access point per frontage.         iii.       No contiguous carparking area containing five or more parking spaces, including access and manoeuvring areas.         Roads, Access, Parking and Loading Areas (District Wide)	<ul> <li>i. See further assessment below.</li> <li>ii. Complies</li> <li>iii. Complies</li> </ul>		
(a)	All new roads, intersections, access, parking and loading areas shall be provided in accordance with the provisions of Appendix 5 – Requirements for Roads, Access, Parking and Loading.	See assessment below		
(b)	Access (i) All sites and activities shall have safe and practicable vehicle access from a public road. All vehicle crossings and intersections shall be positioned and constructed in accordance with the standards in Appendix 5.	See assessment below		
(c)	<ul> <li>Parking and Loading <ul> <li>(i) Provision of On-Site Parking and Loading</li> </ul> </li> <li>(i) 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 activity, in accordance with Table 21.1.25.1 below.</li> <li>(2) Where any activity is changed or any building erected or altered, sufficient vehicle parking and loading shall be provided to meet the demands generated by the altered activity or building, in accordance with Table 21.1.25.1 below.</li> </ul>	As noted below, activity does not align with any of the WCDP categories. Expected parking demands and loading requirements have been assessed in this report. Appropriate provisions have been made for on-site staff and visitor		

#### Table 1 – WCDP Rules Assessment



Rule	Required	Commentary
	(3) On sites where there are multiple activities, and each activity requires vehicle parking in terms of this Plan, the total parking required shall be the combined total requirement for all activities. The Council will consider reducing parking requirements, where it is demonstrable that parking demands generated by each activity do not occur simultaneously and that operational hours or arrangements of those activities means shared parking will occur.	parking, as well as heavy vehicle servicing. The proposal is assessed as meeting the intent of this Rule.
	(4) Loading bays and spaces may be counted as parking space(s) according to the number of parking spaces able to be accommodated.	6
	<ul> <li>(ii) Number of Vehicle Parking Spaces</li> <li>(1) Where the calculation of required vehicle parking spaces results in a fraction of a whole space, any fraction less than or equal to one half shall be disregarded; and any fraction over one half shall count as one space.</li> <li>(2) The area of required spaces, access drives, or aisles provided within a building shall be excluded from the gross floor area (GEA) of the space.</li> </ul>	
	<ul> <li>(3) Vehicle parking spaces shall be provided for activities in accordance with Table 21.1.25.1. If an activity is not listed, then the standard for the activity listed that is closest in nature to that proposed activity shall be applied. Parking requirements do not apply to temporary activities.</li> </ul>	
	<ul> <li>(iii) Parking for the Disabled</li> <li>(1) Any activity shall provide parking for the disabled in accordance with NZS 4121:2001 Design for Access and Mobility – Buildings and Associated Facilities.</li> </ul>	See discussion below Table.
	(iv) Vehicle Access and Manoeuvring Space (1) Each required vehicle park shall have practical access from a public road. Sufficient manoeuvring space shall be provided to enable vehicles to enter and exit the site in a forward direction.	Compliance expected. All on- site parking and loading areas will be designed such that they can be accessed with forward movements only.
	<ul> <li>(v) Vehicle Parking Spaces and Access Aisles to Remain Clear</li> <li>(1) Dedicated vehicle parking space and access shall remain unobstructed by other activities and shall not be diminished by storage of goods or erection of any structure.</li> </ul>	Compliance expected.
	<ul> <li>(vi) Design of Vehicle Parking and Loading Spaces</li> <li>(1) Every parking space shall be designed and constructed in accordance with AS/NZS 2890.1:2004 Parking Facilities.</li> </ul>	Compliance expected.
	(2) Each required loading space shall be of usable shape and have a minimum length of 7.5 metres, minimum width of 3.5 metres, and minimum clear height of 4.5 metres. Sufficient manoeuvring space shall be provided to accommodate a 90 percentile two-axle truck. In the Commercial and Industrial Zones where articulated vehicles are to be used, the layout shall be designed to accommodate such vehicles.	Formal loading bays are not proposed but site has adequate space to accommodate the largest anticipated vehicle (a 19m semi-trailer) parking and manoeuvring on-site.
3	<ul> <li>(vii) Standards of Construction of Vehicle Parking Spaces</li> <li>(1) All required vehicle parking spaces and access aisles shall be formed, sealed and marked, and shall be provided with surface water drainage.</li> </ul>	Unsealed parking spaces are proposed. This is appropriate for occasional use in a rural environment.



Rule	Required	Commentary
2	Appendix 5 – Requirements for Roads, Access, Parking & Loading	
	Standards for Roads, Access, Parking and Loading	
	Roads and Footpaths – design and construction	N/A
	No new public roads or footpaths are proposed         Privateways – design and construction         -       Compliance with NZS4404:2004; and         -       Non-public rural accessways to rear lots of 2 hectares or less, multi-unit or comprehensive residential developments shall be sealed. Non-public rural accessways adjoining lots of 2 hectares or less, multi-unit or comprehensive residential	Complies. Access is not required to be sealed.
	developments shall be sealed.         Sight lines         -       Compliance with RTS6; and         -       Road intersections, no obstructions exceeding 1m in height will be permitted within a 6m by 6m triangle measured from a boundary intersection point (Refer Figure 32.1)	Complies.
	Vehicle crossings <ul> <li>Compliance with NZS4404:2004; and</li> <li>Rural Vehicle Crossings and Frontage Road Seal Widening in accordance with Figure 32.2 below.</li> </ul>	Does not comply. Bespoke design proposed (see Figure 11 and 12).
	Off-street Parking Facilities – geometric layout	Compliance expected
	Turning paths         -       Compliance with AS/NZS 2890.1:2004; and         -       Designed for 85 <sup>th</sup> and 99% car and 99% rigid truck	Compliance expected. Designed to allow for semi- trailer tracking.
	Urban carriageway lighting N/A	N/A
	Facilities for disabled           -         Compliance with RTS 14 for pedestrian facilities (N/A) and NZS4121:2001 for parking facilities	Compliance expected.
	Signage	N/A
	Rural Selling Places	N/A
32.1.4	Intersections and Accessways Road and accessway intersections shall be designed to ensure sufficient sight distances and safety, having regard to expected traffic volumes and speeds on approach roads. Where it is proposed to create a vehicle access or road intersection with any State Highway, the applicant shall obtain the approval of New Zealand Transport Agency. Intersections with State highway shall meet New Zealand Transport Agency requirements.	Complies. Access is appropriately designed and is not on a State Highway or near a rail corridor.
32.1.10	Where it is proposed to create an accessway over or under the railway and/or create an accessway and/or intersection within 30 metres of a road/rail level crossing, the applicant shall obtain the approval of the railway premises owner and/or the railway access provider (ONTRACK). Vehicle Access to Individual Sites All sites and allotments shall have legal practicable vehicle access from	Site has access to a public
	a public road. Seal widening at accesses shall be in accordance with Figure 32.2 below.	road. This has been designed to allow for two-way semi- trailer movement.



Rule	Required	Commentary
	Any vehicle access crossing a waterway shall incorporate culverts appropriate to the volume of water in the waterway and the traffic load on the access. Any earthworks shall comply with the requirements of this Plan. Note: Wellington Regional Council may have additional requirements relating to activities in waterways.	An extension of the existing culvert is required.
32.1.11	Vehicle Parking Spaces, Loading Spaces and Access Aisles All required vehicle parking spaces, loading spaces and access aisles shall be formed and sealed, and shall be provided with surface water drainage in accordance with NZS 4404:2004	Unsealed areas proposed. This is appropriate for occasional use in a rural environment.

The WCDP (Table 21.1.25.1) does not contain a land use category that is directly applicable to a solar farm. The closest general category is 'industrial' however the activity doesn't align well with the WCDP definition<sup>8</sup>.

It is recommended that a demand-based provision of one parking space per employee (post construction) plus one visitor space be made. In addition, no defined loading space is recommended. The site has informal loading areas that can accommodate its maintenance and service needs.

In relation to accessible parking spaces for people with disabilities. It is recommended that one parking space have appropriate dimensions to function as an accessible space if needed. Because the site is expected to have only one or two employees this space would not need to be limited to only people with a disability, as it would be available regardless.

#### 8. CONCLUSIONS & RECOMMENDATIONS

The Applicant proposes to establish a solar farm on a site south of Masterton, adjacent to the existing Transpower substation on Cornwall Road. Based on the assessment described in this report:

- The activity is expected to generate up to 112 vehicle movements per day (vpd) during construction and no more than 10 vpd once operational;
- The site is well located relative to the strategic transport network provided by SH2;
- The expected volume of traffic is expected to have a negligible impact on the operation of the surrounding road network and no changes are required;
- Permanent operational access will be shared with the existing contractor access (see Figure 11) on Cornwall Road. No changes are recommended to the existing layout.
- Temporary construction access (one-way exit) is proposed to be taken from 51 Cornwall Road in the same location as an existing gateway. Access widening is required (see Figure 12).

A CTMP is recommended as a condition of consent to detail the design of this access. It is likely to include warning signs and may recommend temporary speed reduction to advise of slowing / turning vehicles.

<sup>8</sup> Industrial Activities - (parking requirement) activities including associated land and buildings used for manufacturing, fabricating, processing, packing or storage of goods, substances or vehicles, and the servicing and repair of goods and vehicles whether by machinery or hand.



Overall and subject to this secondary approval, the proposal can be supported from a transportation perspective.

Yours sincerely,

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s 7(2)(a)	s 7(2)(a)
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uttach: None	





Marshall Day: Acoustic Assessment



MASTERTON SOLAR FARM ACOUSTIC PREDICTION Rp 002 20230296 | 10 April 2024



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#### **Document Control**

Status:	Rev:	Comments	Date:	Author:	Reviewer:
Draft	00	For team review	14 February 2024	Micky Yang	M Halstead
Draft	01	Planner comments	27 February 2024	Micky Yang	
Issue	02	Team comments	10 April 2024	Micky Yang	

Cover image: Photo by Tom Fisk from Pexels

# MARSHALL DAY

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#### 1.0 SUMMARY

Marshall Day Acoustics has been engaged by Strategy, on behalf of Masterton Solar Farm Ltd, to assess construction and operational noise of the proposed Masterton Solar Farm.

The site is located at 51, 99, and 107 Cornwall Road, Masterton (see Figure 1). The site is located immediately adjacent to the Transpower substation.





Within the larger site area, the proposed solar farm will extend over approximately 25ha, as shown in Figure 2 below. The site is proposed to have 25,000 – 35,000 photovoltaic modules with a combined power rating of 12.5MW (AC) during peak times.

A full description of the proposal is given in the AEE. Appendix A provides a glossary of terminology. Appendix B shows a larger image of the site layout.

Figure 2: Site layout plan



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In summary, we find that:

- Construction noise can comply at all receivers.
- Construction vibration can comply at all receivers.
- Operational noise can comply with both the daytime and night-time noise limits at all rural residential receivers
- The noise level is acceptable given that it complies with both the daytime and night-time noise limits and includes a safety margin to account for special audible characteristics.

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#### 2.0 EXISTING NOISE ENVIRONMENT

We carried out a site visit on 20 June 2023 to measure the existing ambient noise levels during the daytime (i.e. when the solar farm is in use). The weather at the time was cloudy with no wind. We consider this was suitable for an environmental noise survey in accordance with New Zealand Standard NZS 6801:2008 Acoustics – Measurement of environmental sound.

Measurement	Start time	Measure	ed Noise Le	evels (dB)	Comments (main noise	
position	(duration)	L <sub>max</sub>	L <sub>max</sub> L <sub>eq</sub> L <sub>90</sub>		sources underlined)	
MP1	10:51 hrs (15:05 minutes)	58	48	44	Distant quarry operations, water running through culvert, birdsong, cows, distant traffic, barely audible and intermittent construction noise	
MP2 (representative of the closest residential receiver at 573 Hughes Lines)	11:23 hrs (15:04 minutes)	61	44	37	<u>Electrical hum at</u> approximately 600 - 800 Hz from buildings adjacent to substation, birds, cows, distant dogs	
Figure 3: Measurement positions						
1 Bissie	A Repairing			11	Indicative site	

#### Table 1: Existing ambient noise levels



Overall, we consider that the ambient noise environment is typical of a rural environment that is close to a major road. We have not carried out early morning measurements but, based on our experience, expect that they would be approximately 40 dB L<sub>Aeq</sub> with distant traffic noise dominating.

#### 3.0 CONSTRUCTION OUTLINE

We understand that key construction activities include:

- Site preparation earthworks including construction of laydown areas,
- Site access and internal road construction,
- Perimeter fencing,
- Installation of piles to mount the solar panel tracker on,
- Cable trenching,
- PCU pad construction,
- Site compound construction, including storage facilities, parking and loading area,

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- Installation of the:
  - o Solar panel tracker
  - o Solar panels
  - o DC and AC cables
  - o DC combiner boxes
  - o PCUs
  - o 33 kV circuit breaker kiosk
  - o Operation and maintenance buildings,
  - o MET Station; and
- Commissioning and testing of all equipment on site.

Appendix C shows the nearby receivers. The closest receiver is 4022 State Highway 2 (Ballance service centre building) is approximately 250m to the site boundary and approximately 290m from the closest PV panel. This receiver is most relevant for construction noise and vibration.

The closest rural receivers are 573 and 577 Hughes Line, and these properties are adjacent to the south-west of the larger site area. However, the proposed solar farm extent is set well away from this area, and there is a distance of approximately 460m between these rural properties and the nearest extent of the solar farm. These two properties are most relevant for assessing operational noise levels and noise effects.

#### 4.0 CONSTRUCTION NOISE

#### 4.1 Construction Noise Performance Standard

The site is zoned *Special Rural* in the Operative Combined Wairarapa District Plan (WDP). Rule 21.1.13.c) provides the construction noise limits. It refers to the *New Zealand Standard NZS 6803: 1999 Acoustics Construction Noise* to assess, manage, and control construction noise.

We understand that noisy construction works will only occur during the daytime (0700 – 1700 hrs Monday to Saturday) and for no more than 20 weeks. Sunday and public holidays would have no work unless where required by exception for health and safety or construction requirements. Commissioning work and the likes that occur after the plant has been installed is not considered to be construction. We consider it should be assessed under the operational noise limits.

Given this, Table 2 provides the construction noise limits that we consider appropriate. The limits apply at 1m from the façade of an occupied building.

Time of week	Time period	dB L <sub>eq</sub>	dB L <sub>max</sub>
Weekdays	0630-0730	60	75
	0730-1800	75	90
	1800-2000	70	85
	2000-0630	45	75
Saturdays	0630-0730	45	75
	0730-1800	75	90
	1800-0630	45	75
Sundays and public holidays	0630-0730	45	75
	0730-1800	55	85
	1800-0630	45	75

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#### Table 2: Construction noise limits

We understand the general plant in Table 3 will be used (note this list is not exhaustive but illustrates the typical high noise plant). The sound power levels have been sourced from British Standard BS 5228-1:2009 "Code of practice for noise and vibration control on construction and open sites – Part 1: Noise" or from previous measurements carried out by Marshall Day Acoustics.

Equipment	Typical Operating Sound Power	Noise Level (dB L <sub>Aeq</sub> ) at a distance (m)				Setback distance to comply with
	(dB L <sub>wA</sub> )	20	40	80	160	75 dB LAeq
Small impact piling rig	123	92	85	77	70	100
Directional drilling	105	74	67	59	52	18
Excavator (30T)	105	74	67	59	52	18
Small screw piling rig	103	72	65	57	50	14
Loader	103	72	65	57	50	14
Excavator (20T)	103	72	65	57	50	14
Concrete truck and pump	103	72	65	57	50	14
Mobile Crane (200T) operating	102	71	64	56	49	13

Table 3: Plant sound power level and compliance distances with no mitigation

The closest receiver to the solar farm is 4022 State Highway 2 who is approximately 250m from the closest solar panels. All other receivers are further away.

Based on this, we predict that all construction works can readily comply with the noise limits in Table 2.

#### 5.0 CONSTRUCTION VIBRATION

There are no rules related to construction vibration in the CWDP. However, we consider that the German Standard DIN 41503:2016 "Vibrations in buildings – Part 3: Effects on structures" can be applied in the absence of any specific rule. It is widely used in other New Zealand districts. This standard provides vibration limits to avoid cosmetic building damage (i.e. cracking plaster or similar cosmetic damage). For impact piling vibration, the limit at buildings is frequency dependent. As a pragmatic approach, 5mm/s peak particle velocity (PPV) is typically selected as the limit.

Table 4 shows the vibration setback distances for the high vibration plant proposed for this project. They are sourced from our measurement databases. The setback distances are conservative and includes a 100% safety factor to protect against risk of cosmetic damage and to inform when a building condition survey should be carried out.

We have also provided a 2mm/s PPV setback distance. 2mm/s can be clearly felt and is tolerable with prior communication. We have provided this to indicate when the consent holder should engage with the receiver. These values do not include a 100% safety factor and are representative values.

Equipment	Cosmetic damage – Commercial (10 mm/s PPV)	Setback (m) Cosmetic damage – Residential (5 mm/s PPV)	Amenity (2 mm/s PPV)
Vibratory roller	6	14	18
Impact piling (based on a large rig)	8	19	25

Table 4: Vibration setback distances<sup>1</sup>

All receiving buildings are at least 250m away. As such, we have no concerns with respect to construction vibration and compliance with DIN 4150 during impact piling.

Additionally, we have no concerns with regard to construction vibration amenity.

<sup>1</sup> Includes a 100% safety margin to allow for different ground conditions

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#### 6.0 OPERATIONAL NOISE

#### 6.1 Operational Noise Performance Standard

The site and surrounds are zoned *Rural* in the WDP. Rule 4.5.2 (f)(i) of the WDP provides noise limits for operational noise. They are:

- 55 dB L<sub>A10</sub> 0700 1900 hrs
- 45 dB L<sub>A10</sub> 1900 0700 hrs
- 75 dB L<sub>AFmax</sub> 2100 0700 hrs
- Noise to be measured and assessed in accordance with NZS6801/6802:1991. We note the WDP refers to the 1999 and 1991 versions of those standards. They have been superseded by the 2008 versions which we recommend are adopted for this project.
- Applies within the notional boundary<sup>2</sup> of any noise sensitive activity on any other site within the *Rural* zone.

There are no limits that apply if the receiver is not considered to be noise sensitive. Therefore, the closest applicable assessment receiver is 573 Hughes Line who is approximately 460m from the closest extent of the proposed solar farm.

#### 6.2 Operational Noise Prediction

There will be six power conversion units (PCUs). PCUs are skid mounted on a raised concrete pad or pile with similar dimensions as a 40ft shipping container.

The proposed units are Power Electronics HEM-PCSM GEN3 units. Table 5 shows the manufacturer data. Note, it does not show any special audible characteristics (SAC) which means that it does not attract a +5dB penalty. Despite this, we have applied it as a safety margin.

Table 5: Power Electronics HEM-PCSM sound power levels for the inverter/power stations at 100% fan speed + safety margin

Octave band sound power level (dB)								Sound Power	
63	125	250	500	1000	2000	4000	8000	Eevel (dB L <sub>WA</sub> )	
106	105	108	102	100	96	93	91	106	

We understand that the locations of the PCUs will not be finalised until detailed design of the project is undertaken.

At times, the PCUs will operate outside of the daytime noise limits (0700 – 1900), and the night-time noise limits of 45 dB L<sub>Aeq</sub>, at the notional boundary applies.

A 450m separation distance between the site boundary with 573 and 577 Hughs Line is required for the PCUs to comply with the night-time noise limits. This separation distance can be achieved within the site.

In summary, we predict the solar farm can comply with the WDP noise limits because the closest noise sensitive receiver is approximately 460m away from the closest extent of the proposed solar farm. Therefore, the application can be considered a Permitted activity with respect to noise rules and standards.

<sup>&</sup>lt;sup>2</sup> A position 20m from the dwelling on a rural property or the site boundary, whichever is closer

#### 6.3 Noise Effects

Assuming that the PCUs are located at least 460m away from any noise sensitive receiver, we predict that PCU noise levels would be up to 45 dB  $L_{Aeq}$  including a 5 dB penalty for any possible SAC. Based on this and with reference to the measured noise level of 44 dB  $L_{Aeq}$  at MP2 in Table 1, we consider that:

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- PCU noise would likely be clearly perceptible at 573 Hughes Line; however the noise level is acceptable given that it complies with both the daytime and night-time noise limits and includes a safety margin to account for special audible character.
- The character would likely be similar to the existing hum from the existing nearby buildings at the Transpower Substation (i.e. both types of noises would be a 'hum').

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#### APPENDIX A GLOSSARY OF TERMINOLOGY

A-weighting	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.
dB	Decibel The unit of sound level.
	Expressed as a logarithmic ratio of sound pressure P relative to a reference pressure of Pr=20 $\mu$ Pa i.e. dB = 20 x log(P/Pr)
dBA	The unit of sound level which has its frequency characteristics modified by a filter (A-weighted) so as to more closely approximate the frequency bias of the human ear.
L <sub>Aeq</sub> (t)	The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level.
	The suffix "t" represents the time period to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.
L <sub>Amax</sub>	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
Noise	A sound that is unwanted by, or distracting to, the receiver.
NZS 6801:2008	New Zealand Standard NZS 6801:2008 "Acoustics – Measurement of environmental sound"
NZS 6802:2008	New Zealand Standard NZS 6802:2008 "Acoustics – Environmental Noise"
NZS 6803:1999	New Zealand Standard NZS 6803: 1999 "Acoustics - Construction Noise"
PPV	<u>Peak Particle Velocity</u> For Peak Particle Velocity (PPV) is the measure of the vibration aptitude, zero to maximum. Used for building structural damage assessment.
SPL or $L_P$	Sound Pressure Level A logarithmic ratio of a sound pressure measured at distance, relative to the threshold of hearing (20 $\mu$ Pa RMS) and expressed in decibels.
SWL or Lw	Sound Power Level A logarithmic ratio of the acoustic power output of a source relative to 10 <sup>-12</sup> watts and expressed in decibels. Sound power level is calculated from measured sound pressure levels and represents the level of total sound power radiated by a sound source.
Vibration	When an object vibrates, it moves rapidly up and down or from side to side. The magnitude of the sensation when feeling a vibrating object is related to the vibration velocity.
	Vibration can occur in any direction. When vibration velocities are described, it can be either the total vibration velocity, which includes all directions, or it can be separated into the vertical direction (up and down vibration), the horizontal transverse direction (side to side) and the horizontal longitudinal direction (front to back).
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APPENDIX C NEARBY RECEIVERS



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Forbes Ecology: Ecological Values Assessment

23 July 2023 By E-mail

Stradegy PO Box 239 Napier 4140

Attn: Claire Price

Dear Claire,

Fee Forbes Ecology

Dr. Adam Forbes adam@forbesecology.co.nz www.forbesecology.co.nz

#### Re: Ecological assessment of proposed solar farm site near Cornwall Road, Masterton

#### **Background and Scope**

Stradegy have engaged Forbes Ecology Limited to undertake an ecological assessment of land located near Cornwall Road, Masterton, which is proposed for development of a solar farm. The site is in the Masterton District in the Ruamahanga River catchment (Greater Wellington Region).

The site is a pastoral farm covered in improved pasture species with pine shelterbelts and other occasional exotic trees. The site is located approximately 1 km southeast of Masterton township and is at 120 m a.s.l. The proposed extent of development is shown in Figure 1 and the typical character of the site is shown in Figure 2.



15.133 MWac 18.12 MWdc 1761.7 kWh/kWp 42.5%

Figure 1. Proposed location and extent of development.



Figure 2. Typical character of the site. The proposed development boundary is shown in white.

This assessment covers the following scope:

- Desktop assessment of existing reports/data on ecological values,
- Site walkover to assess ecological features on site,
- Assessment of ecosystems and species in the context of their importance and level of constraint.

#### Methods

#### Data Sources

The following data sources were explored to inform the constraints analysis.

- Masterton District Plan maps (Wairarapa maps)<sup>1</sup>,
- Historically rare ecosystems<sup>2</sup>,

<sup>&</sup>lt;sup>1</sup> See: <u>https://maps.tararuadc.govt.nz/IntraMaps90/?project=TDCMaps</u> <sup>2</sup> See: <u>https://www.landcareresearch.co.nz/publications/naturally-uncommon-ecosystems/</u>

- Historical aerial photographs (Retrolens<sup>3</sup>),
- Soil maps (S-Map)<sup>4</sup>,
- OurEnvironment Land Atlas of New Zealand<sup>5</sup>,
  - o Landcover Database,
  - o Threatened Environments,
  - Pre-human vegetation.
- Department of Conservation Maps (GIS)<sup>6</sup>,
- NZ River Maps<sup>7</sup>,
- Greater Wellington Regional Council Key Native Ecosystems online map viewer (GIS)<sup>8</sup>,
- Greater Wellington Regional Council 1.0 m LIDAR contour map<sup>9</sup>,
- Greater Wellington Regional Council Category 1 and 2 waterbodies<sup>10</sup>

#### Waterway Classifications

A site walkover was conducted on 3 March 2023 by Dr Adam Forbes.

Rainfall depths<sup>11</sup> preceding the field surveys are presented in Table 1. The assessment was not undertaken during the wet season (although note comments later regarding preceding monthly rainfall) and a rain event of 12-70 mm (i.e., significant rain event) had not occurred within 48 hours of the field assessments. As a significant rain event had not occurred within 48 hours the focus of the assessment of surface water was to assess at a time of >60 hrs the presence and not the absence of surface water.

ruble 1. Ruman depens prior to the held survey					
Days prior to	Accumulate	d rainfall depth (mm)			
field surveys	31	March 2023			
2		2.4			
7		54.2			
14		77.2			
30		163.8			

Table 1. Rainfall depths prior to the field survey

<sup>3</sup> See: <u>https://retrolens.co.nz</u>

- <sup>5</sup> See: <u>https://ourenvironment.scinfo.org.nz/?gclid=CjwKCAiArNOeBhAHEiwAze\_nKL4-</u>
- RxDAA5EsmV7ORUyo0H8ZoZUekN6ZhY8nsyDp2dj xUIewcOyIxoCRL0QAvD BwE
- <sup>6</sup> See: <u>https://www.doc.govt.nz/map/index.html</u>

<sup>&</sup>lt;sup>4</sup> See: <u>https://smap.landcareresearch.co.nz</u>

<sup>&</sup>lt;sup>7</sup> See: <u>https://shiny.niwa.co.nz/nzrivermaps/</u>

<sup>&</sup>lt;sup>8</sup> See: <u>https://gis.mstn.govt.nz/WairarapaViewer/?map=25092c1c467841908f7854a3ecc1fa41</u>

 <sup>&</sup>lt;sup>9</sup> See: <u>https://data-gwrc.opendata.arcgis.com/maps/gwrc-1m-contours-2020-bp34-masterton-2/explore</u>
 <sup>10</sup> See:

https://gwrc.maps.arcgis.com/apps/webappviewer/index.html?id=06465a0e3ec24b7fa33f8cb2c293edf5

<sup>&</sup>lt;sup>11</sup> Rainfall data are sourced from GWRC website for the Ruamahunga River at Wairarapa College rainfall gauge.

Watercourses were assessed for evidence of intermittently or permanently flowing water. The following aspects were taken as evidence of extended periods of surface water or base flow in a watercourse:

- Aquatic macroinvertebrate presence,
- Obligate or facultative wetland or aquatic vegetation presence,
- Algal growths,
- Anaerobic / hydric soil presence,
- Presence of a spring (hard to observe in summer),
- Fish species presence,
- Historical evidence (e.g., fish records and historical flow data prolonged flows).

If the watercourse exhibited some or all of the above features, then it was considered to be, at a minimum, an intermittent river. The criteria in Table 2 were used to distinguish intermittent from ephemeral hydroclasses.

streams		
Criterion	Definition	
Permanent river or stream		
1	Evidence of continuous flow	
Intermittent river or stream, or ephemeral stream		
1	Evidence of natural pools	
2	Well defined channel. Banks and bed can be distinguished	
3	Surface water present (more than >60hrs after a rain event)	
4	Rooted terrestrial vegetation not present across the entire cross-sectional width of	
	channel	
5	Organic debris present in floodplain	
6	Evidence of substrate sorting processes, including scour and deposition	
Ephemeral stream		
1	Stream bed above the water table at all times	
2	Water present only during and shortly after rainfall	

Table 2. AUP(OP) criteria for permanent, intermittent rivers and streams and ephemeral streams

#### <u>Wetlands</u>

Wetlands were assessed in accordance with the Ministry for the Environment wetland delineation protocols. The approach was in accordance with Table 1 of Clarkson et al.,  $(2022)^{12}$  which involves initial rapid tests followed by plot surveys if rapid tests are inconclusive. The method is not repeated here.

<sup>&</sup>lt;sup>12</sup> See: https://environment.govt.nz/assets/publications/Pasture-exclusion-assessment-methodology.pdf

Weather conditions over the three months prior to the site visit were (measured monthly totals, monthly normals<sup>13</sup>) December 2022 = 126.8 mm (58 mm), January 2023 = 183 mm (63 mm), February 2023 = 161.4 (71 mm). It is clear from these data that the three months preceding the site visit were significantly wetter than normal with December, January and February's rainfall totals being 2.1, 2.9, and 2.3 times greater than normal, respectively.

#### **Limitations**

The AUP stream classification method requires waterway assessments to be undertaken during the wet season. However, while this timing was not possible, the very wet summer had consecutive monthly rainfall totals greater than any normal winter totals (i.e., July is normally the wettest month with 126 mm falling). This point indicates that the conditions were reasonable for assessment of ephemeral waterways.

#### **Results and Discussion**

#### Freshwater bodies and wetlands

The soils and landform within the site are of alluvial origin (running water, S-Map 2023). The soil classification is Typic Fluvial Recent Soils which are of hard sandstone rock parent material. The soils are well drained, with rapid permeability and no slowly permeable horizon. The soils are of moderate drought vulnerablity (S-Map, 2023).

This alluvial history of the site is also confirmed by historical aerial photographs such as the image from 1941 presented below (Fig. 3).

<sup>13</sup> Taken from Table 6 of NIWA's regional climate summary, see: https://niwa.co.nz/sites/niwa.co.nz/files/Wellington%20Climate%20WEB\_0.pdf



Figure 3. Aerial view of the site at 1941.

Today the site is managed for pastoral grazing and is in improved pasture (Figs. 4 & 5). While the contour of the land still shows alluvial formations there are no intermittent or permanent waterways on the site. Any former channels present do not show signs of continuous flow, do not contain natural pools, do not contain distinguishable beds or banks, did not contain surface water, had terrestrial vegetation (exotic pasture species) across all parts of the channel, and showed no sign of debris deposition nor erosion, scour or sediment sorting processes. As such any waterways on the site are assessed as ephemeral, and by implication do not meet the RMA (1991) definition of a River.

No wetlands were present as indicated by vegetation, soils, or hydrology.

The site contains no sites of previously recognised ecological significance (e.g., Key Native Ecosystems or category 1 or 2 waterbodies). The site attributes are insufficient to trigger National Policy Statement for Indigenous Biodiversity (NPS-IB, 2023) ecological significance assessment criteria. Regarding the GWRC Regional Policy Statement, no features on site trigger the ecological significance criteria contained in Policy 23.



Figure 4. Pasture species dominant and vegetation cover of the site.



Figure 5. Pasture species dominant and vegetation cover of the site.

#### **Conclusions and Recommendations**

The site is in improved pasture and is grazed with cattle.

Historically the land supported a series of natural drainage channels. In the current context none of these channels are anything more permanent than ephemeral status. As such there are no Rivers on site in terms of the RMA (1991) definition.

There are no inland natural wetlands present, probably due to a combination of catchment size, free draining ground conditions and a relatively dry climate.

There are no implications for development of the site with respect to the GWRC RPS Policy 23, National Policy Statement for Freshwater Management wetland and waterway provisions, or the NPS-IB SNA/ecological significance criteria.

#### Closing

Please don't hesitate to contact me should you require further advice.

Yours Sincerely,



Dr Adam Forbes Director and Principal Ecologist Forbes Ecology Limited



AgFirst: Productive Capacity Assessment

旧公



Independent Agriculture & Horticulture Consultant Network

> Assessment of proposed solar farm, Cornwall Road, Masterton against National Policy Statement for Highly Productive Land

A report prepared for Masterton Solar Farm

Report prepared by Juliet Chambers April 2024

#### Disclaimer:

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#### 2.0 EXECUTIVE SUMMARY

Masterton Solar Farm Ltd are proposing to utilise approximately 25ha of farmland on Cornwall Road, Masterton for a proposed solar farm. AgFirst Manawatu-Whanganui have been engaged to provide an assessment of the proposal against of the proposal against the National Policy Statement for Highly Productive Land (NPS-HPL).

The subject site is run as a cattle and dairy support operation that is leased out to a dairy farmer in the area. The proposed site is part of an approximate 100-hectare block that is owned by

The solar panels are proposed to be installed on single axis tracking systems (tracking systems) which will be mounted on piles that are either driven or screwed into the ground. The tracking system enables the solar panels to rotate slowing east to west over the course of the day to follow the sun.

At the time of the day when the panels are positioned horizontal to the ground (and approximately 1600mm above the ground), the temporary footprint of the panels and other solar infrastructure equates to approximately 40% of the site. This fully horizontal position occurs temporarily in the middle of the day, but the shading impact from the panels will be considerably less than this for the majority of the day, due to the gradual movement of the panels and their height above the ground.

Once the solar panels are installed, the area under the solar panels will be used to graze sheep, whilst the balance of the title will continue to be run as cattle grazing or the desired land use by the lessee or owner. The solar farm is intended to have a limited duration (40 years), which means that the solar farm will be decommissioned at this time and returned to its previous state.

At Regional Scale only approximately 1.2 ha of the site is considered Land Use Capability (LUC) 3 which is classified as Highly Productive Land (HPL) under the NPS-HPL. This LUC 3 land is all 3s2, whilst the balance of the subject area is LUC 6. As part of the block is HPL, various restrictions apply the use and development of that land with specified exceptions.

Under the NPS-HPL where the solar farm has a functional or operational need to be on HPL, this can be progressed, provided the use of that land minimises or mitigates any actual or potential cumulative loss of the availability and productive capacity of highly provided land in the district.

AgFirst considers that the use of the land as a solar farm is minimised or mitigated by:

- Not a permanent change to the land - at the expiration of the lease, in line with the terms of the lease agreement, solar farm components will be removed, and the soil surface will be returned to its original condition in a reasonable timeframe.

The solar farm and associated activities will only take up 1.2 ha of HPL and the location against the Waingawa River and LUC 6 land does not fragment HPL land over the farm.

The footprint of the works will be minimised, i.e. new tracking taking up only approximately 1520m<sup>2</sup> of HPL, with other tracking utilising existing farm tracks and 5m wide cable corridor to be buried, with grass reinstated.

Sheep can still be grazed under the solar panels throughout the entirety of the project.

(a)

- The balance of the farm can still be grazed by cattle.

At a district level the solar farm will have a less than minor effect on the district's productive capacity availability. The Carterton District has 24,663 ha of HPL, so the installation of the solar farm site would mean an interim loss of 0.00486% of the district's HPL. As aforementioned this loss is also not entire as the panels are designed in a manner to enable sheep grazing to still utilise the land's productive capacity.
### 3.0 BACKGROUND

The subject site is run as part of a wider property, that is owned by **S** (2)(a) has leased out most of the property for many years, mainly running cattle. Figure 1 below shows the location of the approximate 100ha block.



Figure 1: Map of the main block and its location southwest of Masterton.

This main block is located over two terraces in between Cornwall Road to the west and the Waingawa River to the east. The topography of the site is generally flat with a rise in elevation of 3-4m occurs in the southwest of the property, approximately 130-150m from, and somewhat parallel with Cornwall Road. The change in elevation creates two levels, with two thirds of the property located in the east, sitting at a slightly level lower. The site is situated at approximately 215m above sea level.

The block is well subdivided with a track for access off Cornwall Road and running through the middle of the block. Water is reticulated to troughs from a bore on the block. See Figure 2 below. There is little infrastructure on the block, with yards off Hughes Line.



Figure 2: Farm Features Map

Approximately 95ha is currently leased out to a local dairy farmer, with the remainder of the land taken up by the owners contracting business and associated buildings. The lessee runs about 200 heifers as a support block for his main farm. Although the acquisition of the lease is only new, the lessee does not intend to crop on the block or cut supplements (due to distance from other blocks).

Before the new lessee took over the block was leased to a local dairy farmer who used the block as dairy support. The farm policy over the lease block varied year to year depending on the season and overall farm system. However generally up to 400 cows would be wintered on the block with 180-200 calves run over spring. Traditionally about 20ha of crops was put in for the winter grazing for the cows. Silage would be cut from about 50ha, with a second cut of silage taken if season and demand allowed. Furthermore, if extra feed was grown in a good year, baleage would be made. A regular fertiliser programme was maintained on the block with soil fertility indicating this.

Comments from this lessee was that it was a difficult block. Although the soils on the bottom terrace were free draining, thus good for wintering, these soils dried out over summer.

The site Masterton Solar Farm Ltd propose to utilise as a solar farm covers approximately 25 hectares which is 26% of the farm area. This site runs adjacent to the Waingawa River, with the Masterton Substation in the southwestern corner (not part of the title). See Appendix 1 for proposed solar farm layout.

The site Masterton Solar Farm Ltd propose to utilise for the solar farm is as per Figure 2 above and as per the solar layout plans in Appendix 1 which is over three titles:

- Lot 2 DP 325931 that will include the solar farm, buried cable and kiosk
- Lot 1 DP 75496 accessway
- LOT 2 DP 88515 BLK VIII TIFFIN SD existing accessway

The climate in the Wairarapa is warm and dry in summer and cool and wet in winter with droughts and floods a reasonably common occurrence. Temperatures range between 20-28°C in summer and under 10°C in winter with annual rainfall from 800-1200mm (more rainfall towards the ranges). Wind is a feature of the Wairarapa climate, specifically cold winds from the south affecting the lower Wairarapa Valley. This means that shelterbelts are required in many areas for horticulture and arable crops<sup>1</sup>. Conditions are predicted to warm in the future with increasing number of days exceeding 25°C (94 per year by 2090 up from 24 currently). Average temperature is expected to rise by 0.75-1°C across all seasons by 2040<sup>2</sup>. Rainfall is expected to decrease by 4-5% in summer by 2040 which increases the risk of droughts.

In terms of LUC over the subject site, at Regional Scale approximately 1.2 ha of the proposed solar area and associated infrastructure (including accessways and cable corridors) is considered LUC 3, and 24ha LUC 6. In terms of the wider farm 16ha is considered LUC 3, whilst 79ha LUC 6. Only that land which is LUC 3 is classified as Highly Productive Land (HPL) under the NPS-HPL, see Figure 3 below.



Figure 3: LUC of the subject area. Note the accessways and cable corridors are not included on this map, see Figure 6.



#### 4.0 LAND USE CAPABILITY CONTEXT

The Land Use capability ("LUC") system is a basic system of land characteristics designed to describe suitability for a set of generic land uses. The system comprises of two main components. The first is a resource inventory which identifies the physical factors, while the second is a LUC classification where land is categorised into classes based on its capability to sustain one or more productive uses.



Figure 4: LUC suitability for different land uses from the New Zealand Land Use Capability Survey Handbook<sup>3</sup>.

Mapping of the original LUC units across New Zealand was conducted during the 1960's to 1970's and was often done using aerial photography, resulting in low spatial resolution or around 1:50,000. The crude nature of the mapping has meant that the national LUC mapping is useful at a regional scale analysis, but generally has limited use at sub-catchment or farm scale.

Lynn et al. (2009) notes that individual units are split into subclasses, which are deemed to be the dominant limitation. Where multiple limitations occur, the limitation exists in the following order: erodibility (e) > excessive wetness (w) > rooting zone limitations (s) > climate (c). For an individual unit, the following assumptions are generally made:

- The permanent physical limitations of the land will always remain the same.
- The temporary limitations can be removed.
- An above average level of land management is practiced.
- Appropriate soil conservation measures will be applied and maintained.

Physical limitations can be further split up into three categories:

- Permanent limitation cannot be removed such as climate, rock type, slope, soil attributes etc.
- Removable limitation limitations can technically be removed but requires a large investment such as soil wetness, flooding, gravel removal etc.
- Modifiable limitation limitations that can be removed with ongoing investment or management such as erosion, soil moisture deficit, nutrient deficiency etc.

<sup>&</sup>lt;sup>3</sup> Lynn, I. H., Manderson, A. K., Page, M. J., Harmsworth, G. R., Eyles, G. O., Douglas, G. B., Mackay, A. D., Newsome, P. J. F. (2009). Land Use Capability Survey Handbook – a New Zealand handbook for the classification of land 3rd ed. Hamilton, AgResearch; Lincoln, Landcare Research; Lower Hutt, GNS Science. 163p. Retrieved from: https://www.tupu.nz/media/izbjrpy4/land-use-capability-luc-survey-handbook-3rd-edition.pdf



#### 5.0 HIGHLY PRODUCTIVE LAND

Under the NPS-HPL, HPL is deemed to be land, which is LUC 1, 2 and 3. This is informed by the New Zealand Land Use Capability Survey Handbook<sup>4</sup> and the Land Use Classification of the Wairarapa – Southern Hawkes Bay<sup>5</sup>.

The subject site is in the Carterton district. This district is comprised of different land use types; by number of farms 59% are sheep and beef, 14% dairy, 8% forestry, 7% other livestock, 4% Grain and crops and other land uses such as vineyards, orchards and fruit and other horticulture<sup>6</sup>. Overall, the district is 117,997ha with 24,665ha classed as HPL and this is predominantly LUC 3 land<sup>7</sup> (see Table 1 below).

District	Masterton		
LUC	Area (ha)	%	
1	1,610	1.4%	
2	7,377	6.3%	
3	15,678	13.3%	
4	7,792	6.6%	
5	4,162	3.5%	
6	34,551	29.3%	
7	25,639	21.7%	
8	20,732	17.6%	
Unclassified/Other	456	0.4%	
Total	117,997		
Table 1: LUC in the Cartert	on District		

Land in the immediate vicinity of the subject area is of similar LUC class and soil type to the east and north along the river margin, with a large section of highly productive land to the south and west of the site, that is mainly sheep and/or cattle grazing.

<sup>4</sup> Lynn, I. H., Manderson, A. K., Page, M. J., Harmsworth, G. R., Eyles, G. O., Douglas, G. B., Mackay, A. D., Newsome, P. J. F. (2009). Land Use Capability Survey Handbook – a New Zealand handbook for the classification of land 3rd ed. Hamilton, AgResearch; Lincoln, Landcare Research; Lower Hutt, GNS Science. 163p. Retrieved from: https://www.tupu.nz/media/jzbjrpy4/land-use-capability-luc-survey-handbook-3rd-edition.pdf

<sup>5</sup>Noble, K.E (1985) Land Use Capability Classification of the Southern Hawkes Bay-Wairarapa Region: a bulletin to accompany New Zealand Resource Inventory Worksheets: Retrieved from: <u>https://www.mpi.govt.nz/dmsdocument/32326/direct</u> <sup>6</sup> Infoshare (<u>www.stats.govt.nz/infoshare</u>) 2017

<sup>7</sup> Retrieved from <u>https://ourenvironment.scinfo.org.nz/maps-and-tools/app/Land%20Capability/Iri\_luc\_main</u>



Figure 5: LUC 1-3 (HPL) on surrounding land with subject site title selected.

## 6.0 SOIL TYPES

Soils types differ over the subject area, with the LUC 6 land being recent soil and the LUC 3 land being a Gley soil according to s-maps.

In accordance with SMAPs<sup>8</sup>, the soils over the LUC 6 land in the subject site are deemed to be:

• Taumutu is the predominant soil type over the subject area. This soil belongs to the recent soil order of the New Zealand soil classification. Recent soils are weakly developed, showing limited signs of soil-forming processes although a distinct topsoil is present, a B horizon is either absent or only weakly expressed. It is formed in alluvial sand silt or gravel deposited by running water, from hard sandstone parent material. The topsoil typically has loam texture and is moderately stony. The subsoil has dominantly loam textures, with a very gravelly layer from less than 45 cm mineral soil depth to more than 100 cm. The plant rooting depth is 60 - 80 (cm), due to an extremely gravelly horizon with extremely low water storage capacity. Generally, the

<sup>&</sup>lt;sup>8</sup> Retrieved from: <u>https://smap.landcareresearch.co.nz/maps-and-tools/app/</u>

soil is well drained with very low vulnerability of water logging in non-irrigated conditions and has moderate to low soil water holding capacity. Inherently these soils have a high structural vulnerability and a high N leaching potential, which should be accounted for when making land management decisions.

• Ayreburn is the predominant soil type over the LUC 3 area and is a Gley soil. Gley soils are strongly affected by waterlogging, have been chemically reduced, have light grey subsoils, and usually have reddish brown or brown mottles. Waterlogging occurs in winter and spring, and some soils remain wet all year. It is formed in alluvial sand silt or gravel deposited by running water, from hard sandstone parent material. The topsoil typically has silt texture and is stoneless. The subsoil has dominantly clay textures, with gravel content of less than 3%. The plant rooting depth extends beyond 1m. Generally, the soil is poorly drained with high vulnerability of water logging in non-irrigated conditions and has high soil water holding capacity. Inherently these soils have a moderate structural vulnerability and a very low N leaching potential, which should be accounted for when making land management decisions.

The other 20% of soils on the subject area are from the Pallic soil order and therefore have similar properties to that of Auchreddie.

### 7.0 LUC

As demonstrated in Table 2 and Figure 6 below, approximately 1.2 ha of the subject site is considered HPL under the NPS-HPL and all classified as 3s2, which has a soil limitation. Majority of the 1.2ha is for the solar site ( $\sim$ 0.9ha), with 1520m<sup>2</sup> for a new accessway, 1100m<sup>2</sup> for the buried cable and 680m<sup>2</sup> is an existing metalled accessway.

## 7.1 3s2

The LUC unit occurs on flat terraces and plains that have 30-45 cm depth of free draining, lighttextured soils, over gravels and stones. Gravel and small stones may be present throughout the profile, but they are not a hindrance to cultivation. This unit is more susceptible to summer drought and is therefore less versatile than LUC unit IIs1. This is due to shallower soil depth and light-textured topsoils, and it generally occurs in areas where rainfalls are less than 1200 mm/annum. Porina and grass grub can be a problem on this unit. Soils are intergrades between central yellow-brown loams and earths, e.g., Takapau series. They are susceptible to wind erosion when cultivated; however, with correct soil conservation management techniques, such as shelter belt plantings, soil losses can be minimized. Large areas of the unit occur on the Takapau Plains, where, because of the wind erosion hazard, shelter belts have been established in the past. With shelter, and irrigation where necessary, this unit is suitable for cereal crops, small seeds, process peas, lucerne, grapes, berry fruit, beans, tomatoes, and forage crops. The average stocking rate according to the LUC class is 12 su/ha<sup>9</sup>.

## 7.2 6s4

The LUC unit is mapped on very stony terraces or fans where the soils are less than 15 cm deep. These soils are not suitable for cropping because of the combination of shallow soil depth,

<sup>&</sup>lt;sup>9</sup> Noble, K.E (1985) Land Use Capability Classification of the Southern Hawkes Bay-Wairarapa Region: a bulletin to accompany New Zealand Resource Inventory Worksheets: Retrieved from: <u>https://www.mpi.govt.nz/dmsdocument/32326/direct</u>

numerous large stones, and susceptibility to drought. Typical soils are intergrades between central yellow-brown loams and earths, e.g., Tauherenikau stony silt loam, and recent soils from alluvium, e.g., Ruamahanga stony sand. Stones, often up to boulder size, are present throughout the soil profile and on the surface. Stone picking can provide a short-term improvement, allowing occasional root and green fodder crops to be grown. However, repeated stone picking is required because further stones will be brought to the surface at each cultivation. Where this unit occurs on lower river terraces, it may be subject to short duration flooding. The average stocking rate according to the LUC class is 4 su/ha<sup>10</sup>.

Description	Area	Landform	Parent	Slope (°)	Strengths	Weaknesses	Land use	Conditions
	(ha)		Material				suitability	of use
			and soil					
3s2	1.2	Medium-	Fine-	0-3	Flat	Seasonal	Intensive	Shelterbelts
		height	grained			soil	pastoral	required for
		stony	alluvium		Well	moisture	farming	horticulture.
		alluvial	over		drained	deficits		
		terraces	gravels,				Horticulture	
			stony silt		No	Stones		
			loam		present	throughout	Arable	
					erosion	profile		
							Forestry	
6s4	24	Lower	Shallow	0-3	Free	Excessively	Pastoral	Medium
		stony	alluvial		draining	stoney	farming	susceptibility
		alluvial	soils					to flooding
		terraces	(sandy)					
			over gravel					

<sup>10</sup> Noble, K.E (1985) Land Use Capability Classification of the Southern Hawkes Bay-Wairarapa Region: a bulletin to accompany New Zealand Resource Inventory Worksheets: Retrieved from: https://www.mpi.govt.nz/dmsdocument/32326/direct



Figure 6: LUC of the subject area. Note solar farm site has white border.

A site visit of the property was undertaken on 27 July 2023 to undertake a ground assessment of the productive capacity of the subject area. This included digging holes over the subject area to verify the general characteristics of the soil types mapped at regional scale. Holes were dug over the HPL of the subject title, see Appendix 2 and the following observations were noted in Table 3:

Table 3: Soil observation sites		
Soil observation site	Observation	Photo
S1	Free draining, no signs of impeded drainage, minimal stones through the soil profile	
S2	Similar to S1	
S3	More stones through soil profile	

Overall, the soil observations illustrated relatively free draining soils over the LUC 3s2 soils. Note that soil observations were not taken on the 3s2 area within the proposed solar farm area due to a different proposed solar farm footprint at the time of the visit. However, it is considered that these soils would be similar if not more aligned to the LUC 6s4 land given the distinct contour change towards the proposed solar farm area as per Figure 7 below:



Figure 7: Contours of the site. Note white line is the boundary of the solar site, red dash lone the proposed new accessway.

## 8.0 CURRENT AND POTENTIAL PRODUCTIVE USE OF BLOCK

Soil tests were taken from the land, which is 3s2 at 75mm and 150mm with results in Table 4 below. These show that most nutrients are within optimum range with Sulphate-S and Organic S below optimum and magnesium above optimum.

Table 4: Soil fertility test results 2023								
Date	рН	Olsen	QT	sulphate	QT	QT	QT	Organic
		Р	Potassium	sulphur	magnesium	calcium	sodium	sulphur
27/7/2023 -	6.0	27	6	5	13	10	6	6
75mm								
27/7/2023 -	5.9	27	6	6	12	11	6	5
150mm								
Optimum	5.8-	20-30	5-8	10-12	8-10	>1	>3-4	15-20
	6							

As previously discussed, the current land use is cattle grazing and dairy support with the land being leased by a local dairy farmer. Although the property has been cropped in the past, this has been mainly limited to the top terrace of 3s2 land with the 6s4 land on the lower terrace being utilised for winter grazing, due to the free draining nature of the soils. It is considered that majority of the land on the lower terrace would not be suitable for arable cropping due to the stony nature of the soils and the risk of drying out.

Other land use options that could be considered based on the soils present, LUC, climate and surrounding land uses are:

- Sheep and beef
- Arable (only the LUC 3 soils and would be best as part of a rotation with grazing)

## 9.0 BARRIERS TO LAND USE CHANGE

There are a range of factors which influence land use change. This has been described in detail by Journeaux et al (2017)<sup>11</sup>. A summary of some of the key factors are:

- (i) Biophysical
  - Soil type and soil characteristics
  - Topography, particularly slope
  - Climate
  - Water availability for irrigation
  - Impact of land use system on water quality
- (ii) Economic
  - Relative profitability of the land use
  - Access to capital
  - Infrastructure
  - Markets
  - Access to information
  - Access to skilled labour
  - Land tenure
- (iii) Technological change, which often impacts via improving profitability.

<sup>&</sup>lt;sup>11</sup> Journeaux, P., van Reenen, E., Manjala, T., Pike, S., Hanmore, I., Millar, S. Analysis of Drivers and Barriers to Land Use Change. https://www.mpi.govt.nz/dmsdocument/23056-ANALYSIS-OF-DRIVERS-AND-BARRIERS-TOLAND-USE-CHANGE

- (iv) Societal pressures and "license to farm". This is usually manifested in regulations affecting the sector, e.g., around animal welfare, food safety, human welfare, and environmental impacts.
- (v) Personal factors. This covers the wide range of difference in individuals which may affect their thinking around land use change. It would include aspects such as age, education and experience, family circumstances, attitude to risk, access to capital, access to information, and attitude to change.

All these factors interact as an amalgam as drivers and/or barriers for land use; they all interact in different ways and usually never in the same combination. Overall, the research shows that economic factors are often the most powerful in driving land use change decisions.

For this site, the main barriers to land use change are biophysical, economic, and personal factors. Currently the farm is leased out for cattle grazing and any land use change would require reasonable investment in shelter, irrigation, and infrastructure (all dependent on the land use). Furthermore, the farm would be limited by the soils and climate.

### 10.0 LEGISLATION

At national level, the two main pieces of legislation which are relevant are the National Policy Statement for Freshwater Management (NPS-FM) 2020 and the National Environmental Standards for Freshwater (NES-FW) 2020. Both aim to improve the quality of water by including a mix of input standards and risk-based approaches to mitigate freshwater pollution. Examples include a cap on synthetic nitrogen on pastoral operations at 190 kilograms of Nitrogen per hectare, stock exclusion from waterways (dependent on stock class and in some cases slope of land), restrictions on stock holding areas, feed lots and winter cropping and restrictions on intensive land use conversion.

Under the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 the main restriction of land use change is land use conversion to dairy. Resource consent would be reugired for the land use change where it would need to be proved that the new activity would not increase the contaminant load in the catchment or in freshwater and other receiving environments compared to 2 Setptember 2020. Under these same set of regulations, it states that if land was not used as dairy support<sup>12</sup> land during the reference period (2014-2019), then consent is required to use land as dairy support land going forward that would need to satisfy the above threshold. The land has been used as dairy support land during the reference periods.

Resource Management (Stock Exclusion) Regulations 2020 place restrictions on the whole of the main block due to being classified as low slope. Under the regulations beef cattle will need to be stock excluded from all waterways with a bed >1m by 1 July 2025 (includes artificial not modified waterways). All applicable waterways are stock excluded.

(b) are grazed on land that is not grazed by dairy cattle



 $<sup>^{12}</sup>$  dairy support land means land on a farm that is used for grazing dairy support cattle dairy support cattle means cattle that—

<sup>(</sup>a) are farmed for producing milk, but are not being milked (for example, because they are heifers or have been dried off); and

Another piece of national legislation that could affect the subject land will be the requirement of freshwater farm plans through Part 9 of the RMA that encourages actions which will reduce a farm's impact on freshwater. The following farms are required to have a freshwater farm plan:

- 20 hectares or more in arable use •
- 5 hectares or more in horticultural use ٠
- 20 hectares or more in combined use

These are expected to be rolled out from mid-2024, with the roll out for Wairarapa likely to be by the end of 2025. The property will need a freshwater farm plan regardless of the chosen land use as they are over the hectare thresholds. Although these freshwater farm plans do not necessarily prevent the land being used for land-based primary production, they do ensure that inputs and actions on the farm are being managed to reduce their effects on freshwater. Furthermore, there will be the cost involved of completing the Freshwater Farm Plan and ongoing compliance costs.

Rules under the Greater Wellington Regional Council (GWRC) Proposed Natural Resources plan also seek to restrict the impacts on freshwater from agricultural land uses also restricting irrigation of more than 20ha of arable, pastoral, or low intensity horticultural use or 5ha or more of horticultural land use if it is not a low intensity horticultural use.

Farm Plans are also required in priority catchments as detailed below in Figure 8 for arable, pastoral, or low intensity horticultural use of 20 ha or more and horticultural use that is not low intensity of 5ha or more. The requirement for these plans is to be phased in over the next 2 years. After 31 December 2028 these land uses in the priority catchments will require consent. The subject area is not in a priority catchment.



## Schedule Y: Priority Catchments

Figure 8: Map of the Priority catchments for Certified Farm Environment Plans under GWRC Proposed Natural Resources plan

Looking at water allocation for potential irrigation, broadly speaking, core surface water allocation in the Ruamāhanga Valley is at, or close to being fully allocated for by current consents (paper allocation) and groundwater resources across the catchment are also under significant pressure, therefore this creates a high level of risk of any potential land use change that would require irrigation.

### 11.0 ASSESSMENT AGAINST NPS-HPL

In September 2022, the Ministry for the Environment (MFE) and the Ministry for Primary Industries released the NPS-HPL<sup>13</sup>. The single objective of the NPS-HPL is "Highly productive land is protected for use in land-based primary production, both now and for future generations."

Masterton Solar Farm Ltd are looking to install a solar farm over approximately 25ha of farmland on Cornwall Road, Masterton. AgFirst have been engaged to assess the proposal against the NPS-HPL.

The applicable clause under the NPS-HPL is Clause 3.9, which states:

(1) Territorial authorities must avoid the inappropriate use or development of highly productive land that is not land-based primary production.

(2) A use or development of highly productive land is inappropriate except where at least one of the following applies to the use or development, and the measures in subclause (3) are applied:

.....

(j) it is associated with one of the following, and there is a functional or operational need for the use or development to be on the highly productive land:

(i) the maintenance, operation, upgrade, or expansion of specified infrastructure:

(3) Territorial authorities must take measures to ensure that any use or development on highly productive land:

(a) minimises or mitigates any actual loss or potential cumulative loss of the availability and productive capacity of highly productive land in their district; and

(b) avoids if possible, or otherwise mitigates, any actual or potential reverse sensitivity effects on land-based primary production activities from the use or development.

The first part of the clause considers whether there is a *a functional or operational need for the use or development to be on the highly productive land.* This part of the analysis is to be covered by the Assessment of Environmental Effects as part of the consent application.

The second aspect of the Clause considers whether the proposal minimises or mitigates any actual or potential cumulative loss of the availability and productive capacity in the Carterton district.

<sup>&</sup>lt;sup>13</sup> Ministry for the Environment. (2022). National Policy Statement for Highly Productive Land. Retrieved from: <u>https://environment.govt.nz/assets/publications/National-policy-statement-highly-productive-land-sept-22-</u> dated.pdf

Under the NPS-HPL productive capacity is defined as: *"in relation to land, means the ability of the land to support land-based primary production over the long term, based on an assessment of:* 

- (a) physical characteristics (such as soil type, properties, and versatility); and
- (b) legal constraints (such as consent notices, local authority covenants, and easements); and
- (c) the size and shape of existing and proposed land parcels".

This first aspect to make clear is that Masterton Solar Farm Ltd is planning to operate the solar farm for a 40-year period. Whilst this is a considerable length of time, this is not a perpetual lease, i.e., not a permanent change to the land or the landscape. This is an important distinction. At the expiration of the lease, in line with the terms of the lease agreement, solar farm components will be removed, and the soil surface will be returned to its original condition in a reasonable timeframe, therefore although mitigations will be put in place during the construction and operation phase, the land area proposed will be able to return to its current state at the end of the lease.

Furthermore, the extent of HPL covered by the proposal is 1.2 hectare, with the majority on LUC 6 land. The placement of the solar farm also does not fragment the HPL land, with the solar farm following existing fence lines. Therefore, it is considered that Masterton Solar Farm Limited have mitigated the temporary loss of the area of the solar farm to minimise the effect on HPL.

## 11.1 Impact on the productive capacity of the land

The definition of productive capacity is focused on 'land based primary production over the long term'. Production can be divided into (a) the 40-year period under which the solar panels and trackers are installed and (b) after the Project is decommissioned and the land remediated.

## PRODUCTIVE CAPACITY DURING THE 40yr LIFECYCLE OF THE PROJECT

Physical character	istics
Soil type/profile	The steel posts supporting the tracking system will be pile driven or screwed into the ground, in a similar fashion to most fence posts. Although subject to final plans, there will be approximately 380m of new tracks (similar to farm tracks) constructed over HPL at approximately 4m wide, therefore covering about 1520m <sup>2</sup> . The other temporary accessway over HPL, will utilise an existing metalled farm track which covers about 680m <sup>2</sup> of HPL. A buried cable will also utilise about 1100m <sup>2</sup> of HPL, however this will be grassed over once buried. See Appendix 1 for the proposed solar farm layout.
Soil properties	Any minor soil disturbance caused by trenching is likely to be similar to installing water pipes in a farming situation and will not cause long-term or permanent change.
Soil fertility	Soil fertility influences pasture production. It is important to note that soil fertility is a temporary factor that does not influence the underlying land use capability status of the land.

Key influences of soil fertility include the soil parent material, rainfall and removal of nutrient via production (e.g., meat and mik), and application of fertiliser. The change of livestock production from dairy/cattle to sheep will likely result in a lower rate of nutrient removal via product, and thus lower levels of fertiliser applications will be required to maintain soil fertility.           nutrient         There will likely be a positive impact via a reduction in nutrients by grazing sheep as opposed to cattle, through the reduced stocking rate.           drainage         Existing drainage network will largely be retained, and where any changes are required for installation of the solar farm these will not generate uncharacteristic drainage patterns on the site.           Throughout the duration of the solar farm there will be some reduction in the ability to change land use over the small area of HPL For example, it will not be a practical option to graze cattle over the subject area whilst the panels are in place. For example, if the land were to be planted into forest, this would also limit the land use options throughout the duration of the timber crop.           However, this will be minimised by only utilising 1.2 ha of HPL, with some of this area being in tracks that can be utilised for future land uses. The proposed layout also does not fragment HPL on the balance parcel.           ential ting depth         Most research that has been done on the impact on pasture production from solar panels has been international i.e., in America or Europe where the soils and climate are quite different. Massey University is in the process of in field research on this very subject. Preliminary results for a trial conducted on a fixed solar system (solar panels do not move and track the sun) indicate that pasture growth is reduced by		
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I panels will cause some degree of temporary shading, and therefore		panels will cause some degree of temporary shading, and therefore
parters will sudde some degree of temporary shading, and therefore		

<sup>14</sup> https://www.massey.ac.nz/about/news/early-research-could-inform-future-design-of-farm-basedsolar-panels/

	there will be some impact on the amount of solar radiation on the pastures and thus a reduction in total pasture production over the small area of HPL. This will mean that the stock carrying capacity of the subject area will be reduced. An international research paper on the effect of solar farms on lamb growth and pasture production suggested that although pasture production under solar panels (not the area outside the panels) would be reduced by 38%, animal production was not affected due to benefits of shade in hotter temperatures <sup>15</sup> . There is also anecdotal research from Australia pertaining to these findings <sup>16</sup> .	
Legal constraints	There are no anticipated legal constraints with the proposal.	
Size and shape of the land parcels	No change.	
Infrastructure	There will no effect on farming infrastructure over the HPL over the subject area.	

PRODUCTIVE CAPACITY AFTER PROJECT DECOMMISSIONING AND LAND REMEDIATION					
Physical characteristics					
Soil type/profile	No impact on soil type or profile. Pile driven or screwed posts and trenched cable will be removed, this will not affect the soil profile. Furthermore, vehicle tracks could be utilised by future farming system or remediated.				
Soil properties	Soil properties will be largely unchanged, vehicle tracks could be utilised by future farming system or remediated.				
Soil Fertility	As part of the decommission process, soil testing can be conducted and if soil fertility is needed to be remediated it can be done via fertiliser applications after Project decommissioning.				
Soil drainage	No change.				
Versatility	The full versatility of land use options will be restored when the solar farm infrastructure is removed.				
Pasture production	It is possible that some regrassing of pastures may be required.				
Legal constraints	No change.				
Size and shape of land parcels	No change.				
Infrastructure	As per the terms of the solar farm lease, project infrastructure will be removed, and the land returned to its original condition which will not limit in any way future versatile productive uses of the land.				

<sup>15</sup> Alyssa et al. 2021. Herbage yield, lamb growth and foraging behaviour in agrivoltaic production systems. Frontiers in Sustainable Food Systems. April 2021.

<sup>&</sup>lt;sup>16</sup> https://assets.cleanenergycouncil.org.au/documents/resources/reports/agrisolar-guide/Australian-guide-toagrisolar-for-large-scale-solar.pdf

In summary with appropriate mitigation measures during construction such as avoiding mixing of sub and topsoils the effect on soil type and properties will be minimised. The project will have an impact on the versatility of the subject area over the project period. However, this area is only 1 ha of HPL, with the majority over LUC 6 land. Furthermore, the solar panels enable a dual land use opportunity, enabling sheep to be grazed in conjunction with the solar farm. The solar panels will cause some degree of temporary shading over the small area of HPL, which has been assumed to have some impact on the amount of solar radiation on pasture and thus a reduction in pasture production. This assumption is based on the limited research information available. However, the solar panels also increase moisture retention and provision of shade and shelter for sheep which helps to offset this reduction in pasture growth and could in fact result in no effect on animal production and/or have a positive impact on the LUC 6 land.

Once the Project has been decommissioned and the land reinstated and remediated at the conclusion of the Project there will be no ongoing or residual impact on the productive capacity of the land with the ability to utilise the land to full productivity and versatility.

At a district level the solar farm will have a less than minor effect on the district's productive capacity availability. The Carterton District has 24,663 ha of HPL, so the installation of the solar farm site would mean an interim loss of 0.00486% of the district's HPL. This loss is not entire as sheep will still be grazed in conjunction with the panels.

#### 12.0 CONCLUSION

In conclusion, it was identified at regional scale, that only approximately 1.2 hectares of where the solar farm and associated infrastructure is being proposed is classified as LUC 3 soils, thus highly production land.

The subject site is run within an approximate 95ha lease operation to the west of Masterton. The current system run by the lessee on the land is a support block for farms in the area, running approximately 200 heifers.

The area where the solar farm is being proposed takes up 7 paddocks that are in the middle of the farm, bordering the Waingawa River. The area contains no vital infrastructure that affects the operation of farm. The area is also close to the Masterton Substation and existing distribution powerlines. This makes the transition of this area into a solar farm a logical option for the farmer, given that it will not affect the operation of the balance of the property and in fact will utilise a large area of land that is not considered highly productive.

It is considered that the small area of highly productive land that will be utilised by the solar farm will also not compromise the use of the remaining HPL over the rest of the farm.

The proposed use of part of the farm for solar, will not mean a permanent change to the productive capacity of the land. The solar farm is designed to be decommissioned and removed at the end of the project's, estimated 40 years where the farmland will be returned to its previous state.

The project will have an impact on the versatility of the subject area over the project period, in that cattle will not be able to be grazed or crops grown on the area covered by the solar panels. However, this will be minimised by the solar farm being designed in a manner to ensure that sheep can be grazed within the project ensuring that this area of the farm can still be utilised for land based primary production.

Overall AgFirst considers that the proposed solar farm will have a less than minor effect on the district's availability of HPL for land based primary production. It is also considered that the effect on the farm itself will be minimised by enabling a dual land use and the selection of the area still enables versatility of land use to continue on the balance of the property.







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Aurecon: Glint and Glare Assessment

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## **Masterton Solar Farm**

**Glare Assessment** 

## **Masterton Solar Farm Limited**

Reference: 524073 Revision: C 15-April-2024



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ath	Aurecon Group\524073 - NZ Sol	ar Farm Develop	ment - 5 Working	Files\4. Reports	
	Masterton Solar Farm Limited	d			
contact		Client reference			
Date	Revision details/status	Author	Reviewer	Verifier (if required)	Approver
2024-02-09	Initial draft for client review	G Carpenter	C West		
2024-02-14	Second draft for client review	C West		S Gascoigne	
2024-04-15	Updated to include client comments	G Carpenter			B Walter
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Approval			
Author signature	s 7(2)(a)	Approver signature	s 7(2)(a)
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# **Executive Summary**

Masterton Solar Farm Limited (the Client) have engaged Aurecon New Zealand Limited (Aurecon) to undertake a Glare and Glint Assessment to support the proposed Masterton Solar Farm (the Project) at 51, 99 and 107 Cornwall Road. The internal area of the property proposed for the solar farm development is herein referred to as 'the Site'.

## **Glare Scope and Findings**

Glare is a bright light that can affect vision or cause discomfort or damage to the viewer's eyes. Glare can be a nuisance or can be a safety issue if it affects a person who is performing a vision-critical activity such as piloting an aircraft in final approach or driving a vehicle.

The scope of the glare assessment included roads and dwellings within one kilometre of the solar farm site and airfields within approximately 10 km, in accordance with industry best-practice.

A geometric analysis was undertaken for roads and residences and has concluded that all nearby dwellings and drivers on the adjacent roads were not at risk of glare. For all potential viewers, glare is expected to pass overhead.

The GlareGauge software was used to assess glare potential for the nearby Hood Aerodrome two-mile flight approach paths (Flight Path 1 (FP1) and Flight Path 2 (FP2)).

For FP1 (approaching from the northeast) some low-intensity glare is predicted to occur during two limited windows of approximately 5 weeks each year, commencing in late-February and early-September each year. During each of these windows, glare is predicted for a duration of up to 4 minutes per day between the hours of 6pm to 7pm.

For FP2 (approaching from the southwest) some low-to-medium intensity glare is predicted to occur for a limited window of approximately 14 weeks commencing in May each year, for a duration of up to 10 minutes per day only between the hours of around 7am to 8.15am. This is only predicted to occur for positions along the flight path over 2km away from the runway end.

For both flight paths, the effects are expected to be Less than Minor and no mitigation is required due to the low intensity of glare, short amount of time affected, and reduction in effective glare due to cloud cover and software limitations of the GlareGauge model causing it to generally over-predict glare.

#### No material glare is expected to occur as a result of the Project, and no mitigation is required.

## Glint Scope and Findings

Glint is defined as a momentary flash of light that can cause annoyance or distraction. Since the PV modules do not change location and change the angle of tilt slowly, glint will only be caused by movement of the observer. Glint observed from moving vehicles in the vicinity of the Project is not considered to be a significant effect as it is similar to the effect of other structures containing glass such as buildings. The glass used on PV modules reflects sunlight, however it is less reflective than normal window glass and flat water.

#### Glint is therefore not expected to be a significant effect.

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# 1 Introduction

## 1.1 Project Background

Masterton Solar Farm Limited (the Client) have engaged Aurecon New Zealand Limited (Aurecon) to undertake a Glare and Glint Assessment to support the proposed Masterton Solar Farm development.

## 1.2 Development Proposal

The Client proposes to construct, operate and maintain a 25ha solar farm and associated facilities and infrastructure at 51, 99 and 107 Cornwall Road (the Site) in Masterton. Once constructed, the project will have a potential project generation output of up to 12.5MW (AC). The proposed layout is illustrated in Figure 1-1

This proposal will contribute toward the further decarbonisation of the electricity generation industry and assist with New Zealand's transition to a low emissions economy and the achievement of renewable energy targets.

## 1.3 Report assumptions and limitations

## 1.3.1 Review Scope and Uses

- Aurecon has prepared this report for the Masterton Solar Farm Limited exclusively for its use. It has been prepared in accordance with our scope of services and the instructions given. Data or opinions contained within the report may not be used in other contexts or for any other purposes without Aurecon's prior review and agreement
- Aurecon accepts no responsibility or liability to any third party for the use of, or reliance on, the report by any third party and the use of, or reliance on, the report by any third party is at the risk of that party.

## 1.3.2 Assumptions and limitations

- Proposed infrastructure beyond the solar panels have been excluded from this assessment as they do not pose a risk of glare. Single axis tracking with backtracking, ground cover ratio and tracker axis height used in the assessment are provided in Table 1-1. Any changes to the PV array footprint or configuration beyond the maximum development scenario may change the findings and mitigation measures within this assessment.
- Receptors beyond 1km have not been considered in the analysis as per industry standard practice.
- The assumed viewer/driver eye height above ground is up to 2.4 m for roads (truck driver height, i.e., worst-case scenario), and 3.0 m/6.0 m for single/double storey buildings respectively.
- Topography of the Site and surrounding area has been obtained from publicly available information (NASA's Shuttle Radar Topography Mission).
- Solar elevation and azimuth angles have been calculated using the method described by the US Department of Commerce National Oceanic and Atmospheric Administration<sup>1</sup>.
- Modelling of the flight path potential glare has been done with the following assumptions:

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- Final approach flight path length: 3.2 km (2 miles) as per US Federal Aviation Administration guidelines
- Pilot view angle (horizontal): ±50° (GlareGauge standard assumption)
- Pilot view angle (downwards): 30° (GlareGauge standard assumption)
- Approach angle: 3° (GlareGauge standard assumption)
- Height of plane at runway end: 10m (lower than GlareGauge standard assumption of 15m ie 50ft to account for smaller planes at Hood Aerodrome compared to international airports)
- Aurecon is not aware of any air traffic control tower present at Hood Aerodrome and therefore has not considered this infrastructure in our assessment
- No significant glare and glint impact external to the construction site is expected during construction activities. Any impacts within the site will be addressed by the EPC's construction health and safety plan and are not further considered in this report.

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Figure 1-1: Proposed solar farm layout

Groups of solar panels (known as a solar array) will be connected electrically in rows and mounted on a single axis tracking mount, allowing the panels to rotate during the day to follow the suns trajectory. They will be installed in rows into the existing ground to minimise new impervious surfaces. Panels will vary in height depending on their orientation, with a maximum height of up to 4m above ground.

The solar panels will generate DC electricity. This will be transported from the solar arrays to one of several Power Conversion Units (PCU) via underground cabling. Electricity from the PCUs will be transmitted to the existing transmission line to the south of the Site.

The main access to the solar farm will be from Cornwall Road.

The aspects of the proposal most relevant to glare are provided in Table 1-1.

Feature	Parameters
Туре	Monocrystalline silicon photo-voltaic (PV) modules
Mounting structure configuration	PV modules mounted on a horizontal single-axis tracking module support structure, facing east-west and located in rows running north-south. Row width is one module in portrait. Tracker axis height will be approx. 1.6m from ground to midpoint of panels. Proposed ground cover ratio (width of the modules as mounted on the tracker divided by the tracker spacing) is 41.5% as per provided information.
Maximum Power Output	12.5MW (AC)
Module Dimensions	Not confirmed yet. An anti-glare coating on the front glass is included in most modern PV modules.
Tracking system	The tracking angle will likely range from +60 to -60 degrees from horizontal each day. Modules will "backtrack" to prevent row-to-row shading during morning and afternoon when the sun is low. This is discussed further below.
Setback	PV panels will be set back at least approximately 5 metres from all Site boundaries (setback to be finalised in detailed design).

The model types and configuration are indicative and will be subject to a detailed design process by the Engineer Procure and Construct (EPC) contractor prior to construction.



Figure 1-2 Example of typical single axis tracking system with two modules in portrait orientation

# 2 Glare and Glint assessment

## 2.1 Scope

This assessment has been prepared to evaluate the actual and potential generation (including associated effects) of glare and glint. Glare is a bright light that can affect vision or cause discomfort or damage to the viewer's eyes, and can be a nuisance or can be a safety issue if it affects a person who is performing a vision-critical activity such as piloting an aircraft in final approach or driving a vehicle. Glint can be defined as a momentary flash of light that can cause annoyance or distraction.

The purpose of this assessment is to determine whether there are any times at which glint or glare would occur for sensitive viewer positions, and if it occurs, whether it is significant in terms of the brightness of the irradiance received on the retina compared to levels that are expected to affect vision by producing an afterimage or retinal damage.

The scope of this glare assessment has included roads and dwellings within approximately one kilometre of the solar farm as shown in Figure 2-1. In addition, we have included aviation infrastructure within 10 km. This assessment has been prepared based on a maximum development layout as depicted in Figure 1-1 and with PV modules at 1.6m high on average. The glare assessment has included the following observer points and paths:

- Routes:
  - Hughes Line in northeast-southwest direction to the south of the Site area
  - Cornwall Road in northwest-southeast direction to the west of the Site area
  - Norfolk Road in northwest-southeast direction to the northwest of the Site area
  - State Highway 2 in northeast-southwest direction to the northwest of the Site area
  - Solway Crescent Road
     – in northwest-southeast direction to the northeast of the Site area
- Rural residential dwellings:
  - 573, 577 and 580 Hughes Line (3 dwellings)
- Flight path at the airstrip of Hood Aerodrome just over 1km southeast of the Site area

The closest dwellings to the solar farm are shown in Figure 2-1, and the aerodrome position and flight paths relative to the solar farm are shown in Figure 2-2.

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Figure 2-1 Nearest dwellings to site (dark shaded area = solar array)



Figure 2-2 Solar array and nearby aerodrome and flight paths

## 2.2 Methodology

Aurecon has performed an analysis based on the geometry of the sun, PV modules, and observer locations. The GlareGauge software has also been used to assess glare for the flight paths at Hood Aerodrome. This software was not used for the roads and residential dwellings due to its tendency to predict unrealistic glare at angles behind the module. However, the higher complexity of glare analysis for flight paths necessitates the use of software for this aspect of the assessment.

## 2.2.1 Background – backtracking

Most large solar farms utilise single-axis trackers. The tracker controller calculates the sun position continuously based on the date and time, and from this the tracker angle required to get the tracker as close as possible to perpendicular to the sun. The tracker therefore follows the sun through the day in the east-west direction. In the morning and afternoon when the sun is low the rows of modules would shade each other, so to avoid this the trackers "backtrack", gradually lowering as the sun goes down, with the tracker angle calculated based on the sun position and tracker spacing to avoid any shading of the direct sunlight, as shown in Figure 2-3 below. Some trackers also apply backtracking when there is cloud to improve energy capture and trackers also stow in occasional very strong winds.

Backtracking is affected by the tracker row spacing. The spacing is characterised by the Ground Cover Ratio (GCR), which is the width of the modules on the tracker (one or two modules) divided by the tracker spacing (pitch). The provided site design utilises a GCR of 41.5%.



Figure 2-3 Simple tracking module (top) vs backtracking module (bottom)<sup>2</sup>

## 2.2.2 Geometric analysis – roads and dwellings

The solar farm trackers follow the sun, so most of the time the reflection is back towards the sun and glare can only be observed by an observer that is also high up compared to the solar farm, such as in an aircraft or elevated tower (e.g., an air traffic control tower).

For observers at a similar elevation to the solar farm, glare can only occur when the sun is close to the horizon. In this case the PV modules are close to horizontal, as shown in Figure 2-4 below.

<sup>&</sup>lt;sup>2</sup> https://blog.helioscope.com/the-shrinking-boost-of-single-axis-trackers/





Figure 2-4 Sun and reflection (glare) angles with backtracking module

When the sun is very close to the horizon and the modules are near-horizontal, the glare will be seen at close to the same position as the rising or setting sun, i.e., will appear to be just below the sun and therefore will not be particularly noticeable. The sun itself will have a greater effect (i.e., sunstrike).

Glare (including for the assessment of solar facilities) is generally considered to become significant when the angle difference between the incoming solar ray (sun) and the reflected ray (glare) is approximately 10°. Another consideration is that the sun is diffused by the atmosphere when it is close to the horizon (within approximately 3°)<sup>3</sup>.

Using this information, the method to determine whether there is any observer location that can experience glare is to consider the lowest (worst-case) angle of reflection (from horizontal) for which glare becomes significant, and determine based on height difference and distance, whether the reflected light for this worst-case can reach the observer or passes above the observer. This worst-case lowest angle of reflection occurs at the lowest sun elevation.

For the threshold sun elevation angle of 3.0° and GCR of about 41.5%, the module tilt is 4.5° when the sun azimuth angle is 90° (i.e., rising due east/setting due west) and the angle of light reflected off the module is approximately 12° above horizontal. The module tilt is a minimum when the sun azimuth is 90° (assuming the module tracking axis is oriented towards north), therefore the reflected light is at a minimum angle and the potential for glare effects is at a maximum i.e. this is a worst-case scenario. For all other sun azimuth angles, the panel tilt will be higher and reflected glare will be higher, passing further overhead for any potential viewers.

The difference between incoming sun and reflected light angle is 15°, which is larger than the 10° threshold outlined above. Therefore, our assessment has instead used a more conservative minimum sun angle of 2.2°; in this scenario the module angle is 3.0°, the reflection angle is 8.2°, and the difference between the sun and reflection angle is 10.4°, in line with the recommended threshold. This is shown graphically in Figure 2-5 and is a more conservative approach than using the sun elevation of 3°, as the reflection angle is lower and the glare is closer to the viewers. Below this sun angle, the glare will be indistinguishable from the sun itself as the angle between glare and sunlight is too small (less than 10°).



Figure 2-5 Geometry of sun and reflection (glare) at lowest possible reflection angle

<sup>&</sup>lt;sup>3</sup> https://www.nepc.gov.au/sites/default/files/2022-09/draft-national-wind-farm-development-guidelines-july-2010.pdf
Based on this worst-case glare angle and distances from the PV array to potential receivers, Aurecon has calculated the height at which reflected light will be passing over the relevant observer positions.

#### 2.2.3 GlareGauge – aviation

GlareGauge is based on the Solar Glare Hazard Assessment Tool (SGHAT) that was developed by Sandia National Laboratories and commercialised by Forge Solar. The tool was developed in conjunction with the USA Federal Aviation Administration to assess effects on pilots during final approach and air traffic controllers. It enables quantitative assessment of likelihood for potential glare effects on the human eye based on receptor location and PV array information and establishes the time of day and year that glare risks are expected to occur.

GlareGauge has only be used for the assessment of effects for the flight paths and not the roads or dwellings near the Site. This is because the results calculated for viewers at elevations similar to the solar farm are often incorrect due to limitations in the software modelling. The modelling indicates glare effects that will not actually occur; it predicts glare occurring with near-horizontal reflection angles lower than the module tilt angle, when the module would be blocking the reflected light and in reality glare could not occur. However, the model is expected to be more accurate for elevated viewer locations such as a flight path. GlareGauge has therefore been used to provide indicative results for the flight paths at Hood Aerodrome, although we note there is some uncertainty associated with the results due to the errors identified when modelling low and/or distant receptors.

For the GlareGauge modelling Aurecon has used the inputs and assumptions outlined in Section 1.3.2. The flight paths are shown with the proposed solar array area in Figure 2-6. Trees on the southeast border of the PV array area have been included in the model as an "obstruction" which blocks glare, with an assumed height of 5 m.



Figure 2-6 Solar array area (blue) and Hood Aerodrome flight paths (red), riverbank trees (orange)

# 3 Results

### 3.1 Glare



#### 3.1.1 Geometric assessment – roads and dwellings

Trigonometry was used to calculate the height of the reflected glare at each observer point, based on a reflection angle of 8.2°, publicly available topographical information, and the shortest distance between the array and the observer. The results are shown in Table 3-1.

Receptor	Direction relative to solar farm	Approx height of glare <u>above</u> receptor [m]	Glare impact
A - 573 Hughes Line	South	n/a	None
C - 577 Hughes Line	South	n/a	None
D - 580 Hughes Line	South	n/a	None
Hughes Line	Southwest	73	None
Cornwall Road	West	33	None
Norfolk Road	Northwest	67	None
State Highway 2	Northwest	44	None
Solway Crescent	Northeast	103	None

 Table 3-1 Glare height for nearby observers

The receptor properties are all directly south of the solar farm. Glare is only possible in general directions to the east and west (northeast-southeast and northwest-southwest) of the solar array and therefore these dwellings are not at risk of glare.

For all viewer locations the reflected glare is expected to pass overhead.

Aurecon notes that sunlight beam scattering off the module surface may cause a wider potential glare zone (indirect glare). However, for this project the distance between the solar array and potential viewer locations is too great for indirect glare to be a risk.

Nil effects are expected and no mitigation is required for the roads and dwellings around the solar farm.

#### 3.1.2 GlareGauge – aviation

The results are provided in terms of three levels of glare hazard:

- Green Low Potential Hazard: Low potential for a temporary after-image (a lingering image of the glare in the field of view).
- Yellow Moderate Potential Hazard: Potential to leave a temporary after-image of the glare.
- Red High Potential Hazard: Potential for permanent eye damage if observed.

The full glare assessment report is provided as an appendix to this report. The glare analysis shows that the solar farm is expected to produce some "green" and "yellow" glare for the approach path to the southwest of the airstrip (FP2) between May and early August (approximately three months), for periods of up to about 10 minutes per day at times between approximately 7am and 8:15am. Some "green" glare is predicted for the flight approach path to the northeast of the airstrip (FP1) during late-Feb to late-March and early-September to early-October (approximately two months total), for periods of up to 4 minutes between approximately 6pm to 7pm. The total predicted glare is summarized in Table 3-2.

Table 3-2 Flight path results from GlareGauge tool

	Predicted glare result (total hours per annum)		
Flight path	"Green" glare	"Yellow" glare	
FP1 (northeast)	4.1	0	
FP2 (southwest)	11.6	0.7	

For FP2, the end (approximately 700-800m) of the two-mile approach path furthest from the runway is at risk of glare, as shown in Appendix A and Figure 3-1 below. The approach path length of two miles assumed in this assessment is based on large international flights, and Aurecon expects that the required approach path for the small planes at Hood Aerodrome to be less than two miles. Therefore, the effect of the glare is expected to be less in practise. In addition, the far end of the runway approach is less safety-critical than the final distance.



Figure 3-1 Area of flight path affected by glare (green/yellow)

FP1 has predicted glare risk along the length of the approach path, but it is a lower intensity ("green" glare only) and predicted for a shorter amount of time – up to four minutes per day for only two months of the year (late Feb to late March and early Sept to early Oct).

Figure 3-2 shows the hazard levels for the south-western flight path as orange circles; this is well below the hazard associated with viewing the sun directly (green/yellow circle). The glare occurs when the PV modules are close to horizontal, as the sun rises or sets over the horizon. It is a similar effect to reflections of the sun from flat water such as a large pond or lake.





Figure 3-2 Hazard plot for FP2 (southwestern) approaching Hood Aerodrome

The effects from the predicted glare for both flight paths are expected to be Less than Minor and no mitigation is required because:

- The glare intensity is relatively low ("green" and very low "yellow" hazard level)
- "Yellow" glare is predicted only for the end of one two-mile approach path (FP2), which is less important than the end closest to the runway
- The amount of time throughout the year glare is predicted to occur is also very low (less than 10 minutes per day, only 5 months a year and 16.4 hours per year for all potential glare combined)
- The amount of glare impact will be reduced by considering cloud cover (glare cannot occur when the sun is blocked by clouds). The estimated cloud cover at the site is 50% of the time, based on NIWA sunshine hours data from the nearby Masterton EWS weather station<sup>4</sup> this would reduce the total amount of glare to 8.2 hours per year.
- The effects from glare can be easily avoided by scheduling flights at times that glare will not occur, or using the opposite approach direction to the one for which glare is predicted
- If aerodrome users choose to fly at times when glare may occur, glare effects can be reduced by the use of sunglasses
- As noted above, GlareGauge is known to over-predict glare i.e. the modelled results are a worst-case scenario.

# 3.2 Glint

Since the PV modules do not change location and only change the angle of tilt slowly in response to tracking of the sun, glint will only be caused by movement of the observer. Glint observed from moving vehicles in the vicinity of the Site is not considered to be a noticeable effect as it is similar or lesser to the effect of other structures containing glass such as buildings. The glass used on PV modules reflects sunlight, however it is less reflective than normal window glass and flat water<sup>5</sup>.

 <sup>4</sup> <u>https://cliflo.niwa.co.nz/</u>, station number 40984. Monthly sunshine hours data available from Nov 2015 – Jan 2024. Total daylight hours obtained from <u>https://www.timeanddate.com/sun/@2206890</u>
 <sup>5</sup> <u>https://www.nrel.gov/state-local-tribal/blog/posts/research-and-analysis-demonstrate-the-lack-of-impacts-of-glare-from-photovoltaic-modules.html</u>



# 4 Conclusions

Aurecon has performed a glare and glint assessment for the proposed Masterton Solar Farm.

Aurecon has performed a geometric assessment for the surrounding roads and dwellings considering the angles of incident sunlight and reflected light from the solar farm. For very low sun angles, the reflected light will appear to be coming from the same position as the sun, so glare effects are disregarded. The difference between the sun angle and glare reflection angle needs to be greater than approximately 10° for noticeable glare to be experienced. However, in this case the reflected light is significantly higher than any potential observers. Nil glare effects are predicted to occur at nearby dwellings and public roads.

Aurecon has used the GlareGauge tool to estimate glare for the final two-mile approach flight paths (FP1 and FP2) at the nearby Hood Aerodrome.

For FP1 (approaching from the northeast), some low-intensity glare is predicted to occur during two limited windows approximately 5 weeks each year, commencing in late-February and early-September each year. During each of these windows, glare is predicted for a duration of up to 4 minutes per day between the hours of 6pm to 7pm.

For FP2 (approaching from the southwest), some low-to-medium intensity glare is predicted to occur during a limited period of approximately 14-weeks commencing in May each year, for a duration of up to 10 minutes per day between 7am and 8.15am.

For both flight paths, the effects are expected to be Less than Minor and no mitigation is recommended due to the low intensity of glare, short amount of time affected, and reduction of effective glare due to cloud cover and software limitations of the GlareGauge model causing it to generally over-predicting glare.

No noticeable glint effects are expected due to the slow movement of the PV modules.

No material glint or glare is expected to occur as a result of the Project, and no mitigation is required.

# Appendix A

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Preliminary Site Investigation (PSI)

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# PRELIMINARY SITE INVESTIGATION

# 51, 99 & 107 CORNWALL ROAD MASTERTON

PROJECT NO. EAM2403-01

PREPARED FOR MASTERTON SOLAR FARM LIMITED

> PREPARED BY KAREN TOULMIN APRIL 2024

EAM NZ LTD – ENVIRONMENTAL CONSULTANTS PO Box 1154, Napier 4110 Mobile 027 440 5990 Email info@eam.co.nz

### DOCUMENT INFORMATION

TITLE	Preliminary Site Investigation; 51, 99 and 107 Cornwall Road, Masterton
CLIENT	Masterton Solar Farm Limited
VERSION	FINAL
ISSUE DATE	April 2024
JOB REFERENCE	EAM2403-01
DOCUMENT CONTRIBUTOR	S
Report prepared by:	
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### 1 INTRODUCTION

EAM NZ Limited (EAM) has been engaged by MASTERTON SOLAR FARM LIMITED to undertake a Preliminary Site Investigation (PSI), at 51, 99 and 107 Cornwall Road, Masterton (hereon in referred to as the Site). It is our understanding that the site is proposed for commercial development.

This PSI has been undertaken to provide a contamination assessment of the Site and to evaluate human health risks at the Site. A phased approach has been adopted for this investigation with an initial investigation, assembling background information to identify potential sources of contamination from past and present activities. This information is then used to develop a conceptual Site model and investigation strategy.

The purpose of this report is to:

- Confirm whether the site has, more likely than not, been used for hazardous activities or industries and where these may have occurred.
- Based on those HAIL uses, determine whether the proposed subdivision could pose a risk to human health and/or the environment; and

This investigation has been carried out in accordance with the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES).

#### 1.1 SCOPE

The following scope of work was completed:

- Review of available information from Masterton and Carterton District Councils, namely, the Listed Land Use Register (LLUR), property files, historical aerial photographs, and available environmental reports.
- Review client supplied information
- Review readily available historical aerial photography
- Review of the environmental setting of the site.
- Preparation of a PSI report, in accordance with the requirements of the NESCS and with the current 2021 edition of the MfE Contaminated Land Management Guidelines No. 1 and No. 5.

This assessment has been undertaken by a Suitably Qualified Environmental Practitioner (SQEP) in the field of contaminated land assessments. The SQEP holds a BSc Degree in Environmental Science.

# 1.2 LIMITATIONS

This report: has been prepared by EAM for MASTERTON SOLAR FARM LIMITED and may only be used and relied on by Carterton District Council for the purpose agreed between EAM and MASTERTON SOLAR FARM LIMITED as set out in section 1.1 of this report. EAM otherwise disclaims responsibility to any person other than MASTERTON SOLAR FARM LIMITED arising in connection with this report. EAM also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by EAM in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. EAM has no responsibility or obligation to update this report to account for events or changes occurring after the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by EAM described in this report (refer section(s) 1.3 of this report). EAM disclaims liability arising from any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the site conditions, such as the location of buildings, services, and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. EAM does not accept responsibility arising from, or in connection with, any change to the site conditions. EAM is also not responsible for updating this report if the site conditions change.

EAM has prepared this report based on information provided MASTERTON SOLAR FARM LIMITED and others who provided information to EAM (including Government authorities), which EAM has not independently verified or checked beyond the agreed scope of work. EAM does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

Notwithstanding the Report Limitations, we confirm that Carterton District Council can rely on this report for the purposes of determining compliance with the NES guidelines with respect to the development identified in this assessment.

#### 1.3 ASSUMPTIONS

EAM has made the following assumptions during the preparation of this report:

- Information obtained from third parties and MASTERTON SOLAR FARM LIMITED is complete and accurate.
- The observed and inferred conditions are representative of the actual conditions associated with HAIL sites and / or other sites not directly assessed.
- That the future land use of the site will remain commercial/Industrial.
- The property at 107 Cornwall Road will only be part of this site for driveway access purposes. The Masterton Solar Farm will utilise the existing driveway on 107 Cornwall Road to provide access to the site. Based on this assumption, investigation into 107 Cornwall Road for the purposes of this report is limited.

### 2 SITE DETAILS

#### 2.1 SITE DESCRIPTION

The Site is located at 51, 99 and 107 Cornwall Road, Masterton. The legal details are presented here.

TABLE 1. SITE DETAILS	
Address	99 Cornwall Road
	51 Cornwall Road
	107 Cornwall Road
Legal Descriptions	Lot 1 DP 75496
	Lot 2 DP 325931 Pt SEC 364
	Taratahi Plain BLK VIII Tiffin SD
	Lot 2 DP 88515 BLK VIIII TIFFIN SD
Record of Title	CT 42D/409
	CT17C/295 104927
	56B/59
Land area	10.01 ha, 54.0435 ha, 2.64 ha

Figure 1 of Appendix A details the site location.

#### 2.2 PROPOSED DEVELOPMENT

Our client is proposing commercial development, which will cover 18.72, (over an available area of 20.75 ha) of the 64-ha site. Some soil disturbance will be proposed as part of the works to create access and to install the necessary services for the facility. An indicative plan for the proposed development area is included in Appendix A. The solar farm development will be constructed on 51 and 99 Cornwall Road. Shared driveway access to the solar farm will be via an existing accessway which is located on 107 Cornwall Road. The driveway access is the only part of 107 Cornwall Road which is included as part of this development.

# 3 ENVIRONMENTAL SETTING

#### 3.1 TOPOGRAPHY

The topography of the site is generally flat. A rise in elevation of 3-4m occurs in the the southwest of the property, approximately 130-150m from, and somewhat parallel with Cornwall Road. The change in elevation creates two levels, with two thirds of the property located in the east, sitting at a slightly level lower. The site is situated at approximately 215m above sea level.

### 3.2 SOIL

Soils at the site are described by Manaaki Whenua<sup>1</sup> (2019) as well draining recent soils, and poorly drained Gley soils. Recent Soils cover the eastern two-thirds of the site, closest to the

Manaaki Whenua- Landcare Research 2019. S-map - New Zealand's national digital soil map. 10.7931/L1WC7

Waingawa River. Recent soils are weakly developed with a distinct topsoil, but a weak or absent B horizon. They typically occur on alluvial floodplains and young land surfaces. These soils are typical of low-lying areas.

Soils in the west of the site are described as poorly draining Gley soils, which occur throughout New Zealand in low parts of the landscape where water tables are high. They have a high bulk density and movement through the soil is limited when soils are wet. They are prone to waterlogging, which typically occurs during winter and spring. They have light grey subsoils, usually with reddish brown or brown mottles. The grey colours usually extend to more than 100 cm depth.

Manaaki Whenua (2019) describes recent soils at the sites as Taum\_24 (50) %, which is a very shallow, well drained loam. Gley soils are described as Ayre)13 (55%) which is a deep, poorly drained silt over clay.

#### 3.3 REGIONAL GEOLOGY AND HYDROGEOLOGY

The Ruamahanga River is largely responsible for the geology in the Masterton area by depositing unconsolidated sediments ranging from very coarse -grained gravel strata to very fine-grained silt and clay strata. Gravel deposits are overlain by silt dominated strata, which represent overbank floodplain deposits associated with past high-water levels occupying large sections of the floodplain. As the gravel-dominated channel has meandered across the floodplain, over bank deposits have been stripped off and replaced by new deposits of gravel (PDP, 2006).

The GNS<sup>2</sup> 1:250:000 Geological Map 11(Lee, et, al, 2002), describes the geology of the site as Q4a, late Holocene Alluvial deposits of poorly to moderately sorted gravel with minor sand or silt; sometimes weathered, underlying a terrace surface, and/or overlying loess/paleosol couplets and tephra.

Geological investigations completed by Butcher (1996) identify the basin as a synclinal structure aligned with the Whangaehu Valley and is filled with Late Quaternary sandy and silty gravels with minor silt/clay horizons. The basin is bounded to the north by the Tertiary hill country and to the west by the toe of the alluvial fans formed by the Waingawa and Waipoua rivers. The Ruamahanga River is roughly parallel with the latter boundary.

Two aquifer systems appear to be present in the Te Ore Ore sub-basin: an unconfined system between about 15-20m depth; and a deeper, semi-confined aquifer to depths more than 50m beneath a silt aquiclude developed in the central part of the basin. The basin is a locally important groundwater resource for irrigation supply.

#### 3.4 SURROUNDING AREAS

The property is located on the outskirts of Masterton and sits between Cornwall Road, Hughes Line, State Highway 2 and the Waingawa River.

The Waingawa River bounds the property to the east, north-east, and travels the full length of the property. Residential suburbs of the township of Masterton are located on the other side of the river.

Along the north-west boundaries of the property are the Waingawa Industrial area, located across State Highway 2. Bill Hammonds Bark Yard, a bark facility is in the northern corner of the property

<sup>&</sup>lt;sup>2</sup> Institute of Geological and Nuclear Sciences, 1:250:000 Geological Map 11. Lee, J.M, Begg, J.G (2002)

adjacent to SH2 and the Waingawa River. Ballance Agri-nutrients are in the NW corner of the property at the junction of Cornwall Road and SH2.

Land to the West of Cornwall Road and South of Hughes Line is agricultural, mostly pastoral grazing properties.

Along the southern Boundary of the site, in the corner between Cornwall Road and Hughes Line is a contracting yard, owned by our client, the Masterton Substation, and several residential sections.

### 4 PROPERTY HISTORY

A desktop study was undertaken to gain an understanding of the history of the site. The review looks to determine potential contaminants which may be present at the site because of past and present land uses. The following information was sourced to establish the history of the site:

- Carterton District Council property search
- Historical Aerial Photographs
- HAIL review
- Site Visit

#### 4.1 CARTERTON DISTRICT COUNCIL PROPERTY FILES

Property files were requested from Carterton District Council, with the resource management and building consents identified for 51 and 107 Cornwall Road shown in the tables below. There are no property files available for 99 Cornwall Road.

RESOURCE CONSENTS		
CONSENT DATE	CONSENT NUMBER	DESCRIPTION
13/07/2021	210037	Earthworks greater than 20 m <sup>3</sup> in a flood zone
30/06/2006	060018	Subdivide property into 2 lots
11/04/2003	020050	Establish fertiliser service centre and storage facility on
		Cornwall Road, Carterton. Subdivide Lot 2 DP46533.
BUILDING CONSENTS/PERMITS		
CONSENT DATE	CONSENT NUMBER	DESCRIPTION
26/04/1996	960095	Install farm fuelling supply, new tank slab.
16/05/1986	BPC017868	Install space heater
17/06/1974	BPF55699	Storage Shed
14/12/1971	BPD021402	Hay Shed
15/10/1968		Install septic tank at woolshed

Table 1. Resource and Building consents for 51 Cornwall Road

- There are no licences associate with the property.

- There are no sewer or drainage documents associated with the property.
- There are no land or building classifications.
- There are no special land features.
- There are three resource consents.
- There are five building permits.

Resource consent 020050 refers to the subdivision of land located at the corner of Cornwall Road and SH2. In 2003, 3.5140 ha was subdivided from Part Lot 12 DP46533 (51 Cornwall Road) for use of a fertiliser facility for Ballance Agri nutrients. Bulk storage of fertiliser is considered HAIL under Appendix Section A, chemical manufacture, application, and bulk storage, under category 6. Fertiliser manufacture or bulk storage. This parcel of land is not associated with the development site.

No reference to potentially contaminating activities for the site were found.

RESOURCE CONSENTS			
CONSENT DATE	CONSENT NUMBER	DESCRIPTION	
11/07/2022	PB220005	Deemed permitted boundary activity. Locate portable office 4 meters from boundary fence.	
BUILDING CONSENTS/PERMITS			
CONSENT DATE	CONSENT NUMBER	DESCRIPTION	
26/09/1997	BPH11605	Dwelling: approved	
15/02/1985	BPC017763	Maintenance workshop: approved	
08/04/1999	990051	Extensions to existing dwelling	
27/04/2000	000094	Build implement shed	
04/05/01	010097	Build garage	
05/07/01	010161	Extension to existing shed	
05/06/02	020129	Build office and lunchroom	
08/08/2002	020238	Extension to existing storage building	
02/06/04	040200	Install Woodsman DS-80	
10/02/2006	060036	Construct implement shed	
07/11/2006	060302	Construct new dwelling	
17/04/2008	080108 🦰	Construct implement shed	

Table 2. Resource and Building consents for 107 Cornwall Road

The only part of the property at 107 Cornwall Road which will be utilised by this development is the shared driveway, to access the property. No reference to potentially contaminating activities for the site were found.

#### 4.2 HISTORICAL AERIAL PHOTOGRAPHS

Historical aerial photographs of the site, from 1941 through to 2023, were sourced from Retrolens and Google Earth. Arial photographs for the years 1941, 1949, 1953, 1963, 1974, 1978, 1983, 1994, 2003,2008, 2015 and 2023 are presented in Appendix B.

The earliest available imagery of the site was sourced from Retrolens and was taken in 1941. The site at this time was agricultural grazing farmland. The property is barren of any buildings, and clusters of trees are present in the southeast of the site, sporadically placed. The site is bound to the east by the Waingawa River, which travels along the entire eastern boundary of the site. The boundary between the river and the site is thickly vegetated with shrubs. The entire length of the western boundary is bound by Cornwall Road, and further west across Cornwall Road is farmland. A cluster of residential properties are present at the crossroads of Cornwall Road and Hughes Line, in the southern corner of the site. An area of pasture appears to have been cultivated in the south of the site. North of the site is State Highway 2, and further north is farmland.

The surface of the eastern most two thirds of the site appear as floodplains, with natural depressions in the ground surface noted.

No changes are noted to the site in 1949 imagery.

By 1953, the Masterton Substation is located on the southern side of the southern boundary of the site.

The site remains in the same configuration right through to 1959.

By 1974, large pylons can be seen travelling NE-SW across the site. A rectangular pit is observed, together with a small rectangular shed in the north-west of the site. It is understood this is a silage pit. At this time, NZ compost, a composting facility has been established on the north-eastern boundary, adjacent to SH2 and the Waingawa River.

No changes noted in 1978, 1983 and 1994, other than establishment of vegetation and windrows.

By 2003, a contracting yard has been established on the southern boundary.

By 2008, the top corner of the site has been subdivided, and Balance Agri nutrients developed the site. This agrees with resource consent 020050. No changes 2015.

Imagery from 2023 shows quarry along southern boundary, east of contracting yard.

No significant changes are noted to the site, in imagery from 2010, 2018 and 2023.

#### 4.3 ANECDOTAL EVIDENCE

The current site owner, Andrew Tulloch provided the following information:

- Mr Tulloch and his family purchased the property in 1982. Prior to his purchase, the site was used for pastoral grazing.
- The property has been used as a dairy run-off block since purchase, and during this time has only been for beef and dairy cattle. Mr Tulloch has never run sheep on the property.
- There are no offal holes on the site.
- There are no spray storage sheds on the property.
- There are no buildings within the proposed development area.
- A silage pit is located within the site, and within the proposed development area. It has never had any other use, and no chemicals or rubbish waste have been disposed or stored there. The silage pit has a concrete base.
- The property receives regular fertiliser application in the form of superphosphate.
- The herbicide MCPA has been used within the property occasionally to control thistles and fat hen. MCPA is a dimethylamine salt and is not considered to be persistent in soils environments.
- The property has never been treated with DDT phosphate for grass grub in the time of his ownership.
- There is no fertiliser storage on the property. Ballance Agri-nutrients are located on Cornwall Road and there is therefore no need.
  - There are stockyards located in the south of the property, adjacent to Hughes Line on the neighbouring property. Mr Tulloch believes there was previously a sheep spray wash at the cattle yards, however this area has been previously investigated and tested, and two dwellings were able to be erected in the area.

Nova flow drainage pipe has been buried across much of the site, including the proposed development area.

#### 4.4 SITE VISIT

A site walkover was completed by EAM on 17 May 2023. The following observations were noted during the inspection. Site photographs are presented in Appendix C.

- The site is accessed from Cornwall Road, through gateways to the paddocks.
- The site is generally flat, with two levels of elevation. An upper terrace travels through the south-west of the site, approximately 3-4m higher than the lower terrace. A silage pit is built into this upper terrace.
- The site is nearly entirely grassed, with metalled laneways. Shelterbelts are present between pastures. Fences are largely post and electrics.
- The property is used for dairy cattle grazing as a run-off block.
- There are no buildings within the property
- No visual or olfactory evidence of potentially contaminating activities were observed.

Site photographs are presented in Appendix C.

#### 4.5 HAZARDOUS ACTIVITIES AND INDUSTRIES LIST

In accordance with Appendix C: Hazardous Activities and Industries List (HAIL) of the MfE NES for Assessing and Managing Contaminants in Soil to Protect Human Health, the site, and its current and historic land use activities does meet any criteria for HAIL classification. The site is not considered HAIL.

# 5 SITE CHARACTERISATION

#### 5.1 HAZARDOUS SUBSTANCES AND POTENTIAL CONTAMINANTS OF CONCERN

Historically, the site appears to have been used for pastoral grazing purposes. The current owners have used the property as a dairy run off block since the early 1980's and it is understood it was used for pastoral grazing prior to their purchase. The herbicide MCPA has been used on the property to control weed growth of thistles, fat hen and other unwanted species. This herbicide is not considered to be persistent in soil environments.

The property has been cultivated and re-grassed/cropped as required, and tillage of soils would assist in reduction of any residual sprays, and cadmium-based fertilisers within the soil environment. Based on the information gathered in this investigation, there are no potential contaminants of concern which have been identified within this site.

# 5.2 POTENTIALLY RELEVANT SENSITIVE HUMAN AND ECOLOGICAL RECEPTORS

The site is proposed for commercial development. The MFEs National Environmental Standard (NESCS) for soil contaminants, considers that commercial landowners may experience varying degrees of exposure to soil through routine maintenance, gardening and activities associated with excavation as part of maintaining subsurface utilities. These activities pose a risk to the consumer/landowner's where contaminated soils are involved in an exposure pathway.

The following potential receptors were identified as being relevant to the Site:

Earthworks, construction, maintenance, and excavation contractors who may encounter soil during the proposed works via inhalation (dusts).

#### 5.3 EXPOSURE PATHWAYS

Site run-off, and any contaminants would be expected to drain to the east, towards the Waingawa River. Drainage channels are located along the western side of the property between Cornwall Road, and the property, and these drainage channels eventuate in the Waingawa River. Any residues are likely to be present in shallow topsoils.

A human health risk can only occur when there is a direct link between contaminant source and receptor. If contaminants of concern were present in site soils, its principal transport and exposure pathways could include:

- Dermal (skin) contact with soil, for construction.
- Direct contact and inhalation of dusts and soil during construction and site works.

#### 5.4 RISK ASSESSMENT

In contaminated land practice, a 'contaminant linkage' is said to be present if a sensitive receptor could be exposed to a contaminant discharged from a source. If there are no complete contaminant linkages, the site is highly unlikely to pose a threat to health or the environment.

Based on the above assessment, there are no source-pathway-receptor linkages which may currently be complete.

### 6 SITE CHARACTERISATION

#### 6.1 CONCLUSIONS

EAM was engaged to undertake a Preliminary Site Investigation of 51, 99 and 107 Cornwall Road, Masterton. The objectives of the investigation were to review:

- 1. The history of the site through property files, historical aerial imagery, and a site visit
- 2. Whether potential past and present hazardous activities, in accordance with the MfE HAIL (Hazardous Activities and Industries List) may have occurred at the site which may pose unacceptable risk to human health or identified environmental receptors.
- 3. To identify whether soil assessment is required in areas of possible HAIL activity, to assess suitability of the site for its intended purpose.

A detailed site history was undertaken to review the historical land use at the site. Available aerial imagery suggests that the site has been a farmland since at least 1941. The current owner has utilised the property for beef and dairy grazing since the 1980's. Prior to current ownership of the property, it was understood to be pastoral grazing.

Based on the information presented, EAM concludes that the area of the site proposed for development is has not been exposed to HAIL activities. It is considered highly unlikely that there will be a risk to human health during and following the proposed commercial development.

# 6.2 RECOMMENDATIONS

No further investigation is considered necessary.

## 7 REFERENCES

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Ministry for the Environment, 2011c. Methodology for Deriving standards for Contaminants in Soil to Protect Human Health. Ministry for the Environment, Wellington.

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National Environmental Protection (Assessment of Site Contamination) Measure, 1999, Australia.

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

MfE 2012 Users' Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health, Ministry for the Environment.

Manaaki Whenua- Landcare Research 2019. <u>S-map - New Zealand's national digital soil map.</u> 10.7931/L1WC7

#### APPENDIX A-FIGURES





FIGURE 1- SITE BOUNDARIES OF 51, 99 AND 107 CORNWALL ROAD, MASTERTON

PRELIMINARY SITE INVESTIGATION: 51, 99 AND 107 CORNWALL ROAD, MASTERTON

#### FIGURE 2. PROPOSED DEVELOPMENT AREA



PROJECT: EAM 2403-REP-01

**REPORT STATUS: FINAL** 

# APPENDIX B- AERIAL PHOTOGRAPHY











1978- Source, Retrolens



1983- Source, Retrolens





2004- Source, Retrolens



2008- Source, Google Earth




# APPENDIX C- SITE PHOTOGRAPHS



**Top.** Northern most pastures between Ballance and Bill Hammond Bark. **Middle.** Balance. **Bottom.** Pastures directly south of Ballance, drain along western boundary.



Above. South-western pastures on upper terrace.



Top. Substation. Middle. Looking north over upper terrace. Bottom. Pasture on lower terrace in south-east.



Top. Silage Pit. Intercepts lower and upper terraces. Middle. Eastern pastures looking east. Bottom. Gravel tracks across farm.



Above. Eastern pastures.



#### **Detailed Design Process**

- Prior to construction, the consent holder shall submit the information required in Condition (2) and (3) and have certified by, the Team Leader Compliance and Monitoring, Carterton District Council.
- 2. A drawing set detailing:
  - a. Internal layout of the solar farm including the:
    - i. Location of the internal roads;
    - ii. The layout of the solar arrays and setbacks from road frontages, property boundaries and stream;
    - iii. Location and design of the Power Conversion Units; and
    - iv. The treatment of the channelised and culverted stream and inland natural wetlands.
  - b. Layout within the Site Compound:
    - i. Storage and maintenance buildings;
    - ii. 5,000L water tank;
    - iii. Up to 4 carparks; and
    - iv. Loading bay.
  - c. Cross sections of the internal road.
  - d. Stormwater management across the site.
  - e. Earthworks Plan:
    - i. Total volume and area of earthworks;
    - ii. Cut and fill heights;
    - iii. Extent and detail of trenches;
    - iv. Demonstrate how and where surplus material is to be managed on site.
- 3. The final drawing set required in Condition (1) shall ensure compliance with the following:
  - a. Site access location as consented in RM Ref xx;
  - b. Site boundary setbacks and mitigation planting as consented in RM Ref XX;
  - c. Maximum height of buildings, facilities and structures as set out in the consent RM Ref xx;
  - d. Rural (Special) Zone night-time noise limits.

#### General accordance

- 4. The consent holder must construct, operate and maintain the Solar Farm in general accordance with application submitted and approved (Ref RM xx), updated information required by Condition (1) and the certified Construction Management Plan required by Condition (6) in fulfilment of the conditions of this resource consent.
- Prior to construction, the consent holder must notify the Team Leader Compliance & Monitoring, Carterton District Council at least 20 working days before works on the Solar Farm site commence.

#### **Construction Management**

- Prior to construction, the consent holder shall submit a draft Construction Management Plan (CMP) and have certified by, the Team Leader Compliance and Monitoring, Carterton District Council. The CMP is to cover at minimum the following topic areas:
  - a. Confirm and demonstrate compliance with New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001);
  - b. Confirm construction activities, staging and scheduling;
  - c. Location of temporary laydown areas;
  - d. Location and treatment of topsoil stockpiles;
  - e. Location and use of erosion and sediment controls;
  - f. Dust management, particularly during summer months;
  - g. Hours of operation;
  - Adherence with the New Zealand Standard NZS 6803:1999 "Acoustics Construction Noise";
  - i. Accidental discovery protocol key contacts, processes and procedures to follow;
  - j. Community complaints procedure and contacts;
  - k. Contractor information, role and responsibilities; and a
  - I. Construction Traffic Management Plan (CTMP).
- 7. The CMP must be submitted to the Team Leader Compliance & Monitoring, Carterton District Council for technical certification at least twenty (20) working days before construction works commence on the Solar Farm site.
- 8. Should the CMP not be certified by Council the Consent Holder must then submit a revised CMP.
- Amendments to the CMP and any of its appendices must be certified in writing by Team Leader Compliance & Monitoring, Carterton District Council following the procedures set out in Conditions 7 and 8.
- 10. The consent holder must ensure that all contractors engaged to undertake activities authorised by this resource consent are supplied with a copy of and made aware of the conditions and management plans that apply to this resource consent that are relevant to their work area and the measures required for compliance with the conditions.
- 11. The consent holder must ensure the Solar Farm site is managed in accordance with the certified CMP during the construction period until the Solar Farm site is stabilised (i.e., no longer producing dust, water- borne sediment or potential contaminants).
- 12. All disturbed ground surfaces must be adequately surfaced as soon as reasonably possible to limit dust, contaminant or sediment mobilisation.
- 13. Dust emissions for construction works must be managed so they do not cause a nuisance beyond the boundary of the Solar Farm site. Dust mitigation measures including but not limited to water carts or sprinklers may be used on any areas of exposed soil.

- 14. All loading and unloading of trucks with excavation or fill material must be carried out within the Solar Farm site.
- 15. The consent holder must ensure that any debris tracked onto Cornwall Road from construction traffic is cleared from the carriageway as soon as practicable.
- 16. In the event of an archaeological site, waahi tapu or koiwi being discovered or disturbed during the activities authorised by this consent, the consent holder must immediately cease further works in the immediate vicinity of the accidental discovery and inform:
  - a. Rangitāne o Wairarapa,
  - b. Ngati Kahungunu ki Wairarapa,
  - c. Carterton District Council; and
  - d. Heritage New Zealand Pouhere Taonga (04) 472 4341.

Further work in the immediate vicinity of the accidental discovery must be suspended while iwi carry out their procedures for removal of taonga. The Carterton District Council's Manager Regulatory Services will advise the consent holder when work in the Solar Farm site may recommence.

In the event that human remains (koiwi) are found the New Zealand Police must be contacted immediately and all works must cease until the Carterton District Council's Manager Regulatory Services advises that works can recommence.

#### **NZECP Compliance**

17. All land use activities, including the construction of new buildings/structures, earthworks, fences, any operation of mobile plant and/or persons working near exposed line parts must comply with the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001) or any subsequent revision of the code.

#### Decommissioning

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- 18. At least three months prior to the commencement of decommissioning of the Solar Farm, the consent holder must submit a Decommissioning Plan to the Team Leader Compliance & Monitoring, Carterton District Council for certification that it fulfils the requirements of the following conditions.
- 19. The Decommissioning Plan must be prepared by a suitably qualified and experienced person and meet the following objectives:
  - Decommissioning of the solar panels and all associated infrastructure in a manner that complies with all legislative requirements;
  - Leaving the land in a condition that is safe and suitable for the subsequent land use; and
    - Ensuring that the components and infrastructure are disposed of in a way that maximises re-use and recycling. For any parts that cannot be reused or recycled, ensuring that they are disposed of in an environmentally responsible way in accordance with industry best practice.

- 20. The Decommissioning Plan must include but not be limited to:
  - Details on all infrastructure to be decommissioned, including details, method and location of reuse, recycling or disposal and the reasons why the options have been chosen;
  - Details of specific infrastructure to remain on-site post-closure and reasons why it will remain on Solar Farm site;
  - c. Scheduling and timing for decommissioning; and
  - d. Details for finished ground cover at completion of decommissioning and future intended land use.



Analysis of Objectives and Policies

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#### **Operative District Plan**

The relevant Objectives and Policies of the Combined Wairarapa District Plan have been analysed against the proposed solar farm activity and this is set out below.

Part A Environmental Zones

#### Section 4 Rural Zone

The introductory paragraphs to the Rural Zone explain the general composition of the rural areas of Wairarapa and note that

...

The character of the rural environment is shaped by the different forms of primary production that occur there but also by the range of other activities that rely on a location in the rural area and which contribute to the economic and social fabric of the Districts. While rural properties vary in size, the rural environment is typically characterised by the following elements:

- Open space, natural landscapes, and vegetation predominate over the built environment;
- Working productive landscape, with a wide range of agricultural, horticultural and forestry purposes, with potential for associated effects, including noises and odours;
- Large areas of exotic and indigenous vegetation, including pasture, crops, forest and scrublands;
- Range of built forms, from reasonably large utilitarian buildings associated with primary production, through to small utility buildings;
- Place where people live and work, with low population density;
- A road network ranging from unsealed local roads with low traffic volumes to busy State Highways; and
- Allotments self-serviced in terms of water supply and wastewater disposal.

In addition to these general characteristics, there is also a recognition (Significant Resource Management Issue 4.2.11) that renewable energy generation facilities are to locate in the rural environment because of their land area and siting requirements.

#### 4.3.1 Objective Rur1 – Protection of Rural Character and Amenity

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.

Policy 4.3.2(e) seeks to 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
- (v) Self-serviced allotments.

Section 7.2 of this application explores the actual and potential adverse effects from the proposed solar farm on rural character and amenity by assessing the landscape and visual effects, noise and traffic and conclusions made the effects on rural character and amenity are less than minor on the environment.

In terms of rural character, the landscape and visual assessment is made in context of the attributes and elements described in the above objective and policy and evaluations made on the actual characteristics specific to the site and locality. Overall, it is considered that the proposed solar farm represents a non-rural activity that, while different, can work on the site and surrounds



and not generate adverse visual effects or effects on the landscape values.

Part B District Wide Issues

#### Section 8

#### Tangata Whenua

#### 8.3.1 Objective

To recognise and provide for the cultural values and relationship of Tangata Whenua in managing the natural and physical resources and the effects of activities, while taking into account the principles of the Treaty of Waitangi.

#### 8.3.2 Policies

- (a) Recognise Tangata Whenua values and provide for Tangata Whenua to maintain and enhance their traditional relationship with the natural environment.
- (b) Have particular regard to the exercise of kaitiakitanga by Tangata Whenua in the management of activities and resources..
- (c) Protect waahi tapu, sites of cultural importance and other taonga.

The early engagement with Rangitāne o Wairarapa and Ngāti Kahungunu ki Wairarapa was made and is described in Section 6 of this AEE.

The statutory policy and planning documents identify the Waingawa River as having cultural values and is a Schedule B waterbody. There are no known sites of significance on the site itself, as determined by desktop analysis and reviewing GWRC and CWDC planning maps.

The proposed solar farm will not adversely affect the values of the Waingawa River, given the distance from the river corridor and buffer made by the existing esplanade and established vegetation.

## Section 9

Landscape

#### 9.3.1 Objective

To identify and protect the Wairarapa's outstanding landscapes and natural features from the adverse effects of inappropriate subdivision, use and development.

Policies 9.3.2(a) - 9.3.2(f) are relevant to outstanding landscapes and natural features, and not relevant to the application.

Policy 9.3.2(g) directs that subdivision and development is managed by having regard to the adverse effects on the landscape values of the site and locality.

The actual and potential adverse effects on the site and surrounding landscape values are explored in Section 7.2 of the AEE and supported by the landscape and visual assessment by Wayfinder in Appendix 4 of the AEE. To summarise, the effects are considered to be less than minor on landscape values and therefore consistent with the objective and policy above.

### Section 14

#### Natural Hazards

#### 14.3.1 Objective

To manage activities and development within areas at significant risk from natural hazards, to avoid, remedy or mitigate the adverse effects of those hazards.

#### 14.3.2 Policies

(a) Identify areas at significant risk from the effects of natural hazards, and update as new

information becomes available.

- (b) Control the location and design of land use and subdivision in identified areas of significant risks from natural hazards to avoid remedy or mitigate adverse effects, with the controls appropriate to the level of risks.
- (c) Manage the type, location and design of new activities and development to avoid, remedy or mitigate the adverse effects of natural hazards to prevent unnecessarily exacerbating the risks to life, property and the environment from the effects of natural hazards.
- (d) Avoid as practicable the siting of new 'lifeline' infrastructure and services within areas of significant risks from natural hazards.
- (f) Ensure that where development occurs within areas of significant risks from natural hazards, property owners and/or occupiers are appropriately informed of the risk.
- (g) Raise awareness and educate people about the risks of natural hazards, and help them prepare, design and plan for the occurrence of natural hazard events through the provision of information and advice.

Flood hazard risk and effects are explored in Section 7.3 of the AEE, supported by the Preliminary Civil Design Report by CF Projects (Appendix 3). CF Projects demonstrate how the proposed solar farm can by designed to respond in a 1% AEP flood event and avoid worsening flood effects on neighbouring properties.

While the proposed solar farm is a regional and nationally significant infrastructure project, it is not 'lifeline' infrastructure.

#### Section 16

### Network Utilities and Energy

#### 16.3.4 Objective

To move the Wairarapa towards a sustainable energy future by encouraging energy efficiency and the generation of energy from renewable sources.

#### 16.3.5 Policies

- (b) Recognise the local, regional and national benefits to be derived from renewable energy generation.
- (c) Recognise and manage appropriate development of the Wairarapa's significant potential renewable energy resource.
- (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.
- (e) Recognise and promote the use of environmental management codes of practice and best practice methods in energy generation, distribution and use.

The Rural Zone (including the Rural Special Zone) is recognised as having potential for renewable electricity generation and in the consideration of these types of developments the benefits at local, regional and national level are to be recognised, as well as the actual and potential adverse effects generated locally.

The assessment of environmental effects in Section 7 of this application demonstrates that the proposed solar farm can internalise environmental effects to the site. The site is ideally placed to connect to the National Grid and supply renewable electricity efficiently.

#### Section 17

#### Transportation

#### 17.3.1 Objective

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.



#### 17.3.2 Policies

- (a) Identify and manage a hierarchy of roads within the Wairarapa to ensure that the function of each role is recognised and protected in the management of subdivision and land use.
- (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.
- (c) Establish controls and standards on new intersections and access points onto roads to avoid, remedy or mitigate any adverse effects on the roads' safe and efficient functioning.

The actual and potential adverse effects on the on the safe and efficient functioning and operation of the road network are explored in Section 7.2 of the AEE and supported by the Transportation Assessment Report by EEC in Appendix 5 of the AEE. To summarise, the actual and potential effects on hierarchy of roads and the safe and efficient functioning, from both the construction and operational traffic, are considered to be less than minor and therefore consistent with the objective and policies above.

#### Proposed District Plan

The relevant Objectives and Policies of the Proposed Combined Wairarapa District Plan are considered below.

#### ENG – Energy

#### ENG-01 Benefits of renewable electricity generation

The significant local, regional, and national benefits of renewable electricity generation are recognised and provided for.

#### ENG-02 Adverse effects of renewable electricity generation

Renewable electricity generation activities are designed and located to minimise adverse effects on communities and the environment while recognising their operational or locational constraints.

#### ENG-P4 Large-scale renewable electricity generation activities

Provide for large-scale renewable electricity generation activities where effects are appropriately managed, by having regard to:

- a. benefits of large-scale renewable electricity generation;
- b. any locational, technical, or operational constraints;
- c. transport and infrastructure capacity to accommodate the activity;
- d. earthworks and construction effects;
- e. the design and site layout of the activity and its ability to internalise effects;
- f. potential adverse effects from the activity, including traffic generation, visual, light, safety, and noise;
- g. whether there is adequate separation from sensitive activities to ensure adverse effects, including potential adverse reverse sensitivity effects, are minimised;
- h. cumulative effects from multiple renewable electricity generation activities;
- i. potential for adverse effects on natural features and landscapes, waterbodies, indigenous biodiversity, historic heritage, and sites of significance to Māori;
- *j.* potential effects on the productive capacity of the land, including the ability to protect the productive capacity of highly productive land;
- *k.* consideration of long-term management and responsibilities for the development; and *I.* any adaptive management measures proposed.

The AEE and supporting technical documents demonstrate the above considerations, where these are applicable.

TR – Transport

TR-O3 Effects of activities on the transport network

The safe, effective, and efficient operation of the transport network is not compromised or constrained by incompatible land use, subdivision, and development, including High Traffic Generating Activities.

Policies

TR-P3 Role of transport corridors

Identify and manage a classification of roads and other transport corridors within the Wairarapa based on the One Network Framework to ensure that the function of each corridor is recognised and protected when managing subdivision and land use.

TR-P4 On-site facilities

Require on-site facilities including loading, parking, manoeuvring and vehicle, pedestrian, and cycle access to meet minimum standards, or where these are not met, ensure they are appropriate for the demands of the activities and development carried out on the site and avoids, remedies, or mitigates any adverse effects on the safe, effective, and efficient functioning of the transport network.

Section 3.4 and 3.5 describe the proposed access for operational and construction activities associated with the proposed solar farm, as well as peak vehicle movements per day. On-site parking and loading is also described. Section 7.2 of the AEE addresses traffic effects, including the effects on the safety and efficiency of the local road network. The parking and loading will meet the demand generated by the activity, and there is sufficient room to provide for it on-site within the site compound.

#### NH – Natural Hazards

#### NH-O1 Risk from natural hazards

The risk and consequences from natural hazards on people, property, infrastructure, and the environment are not increased.

#### NH-O2 Natural features

Natural features are used to reduce the susceptibility of people, communities, property, and infrastructure to damage from natural hazards.

#### NH-P2 Activities in high hazard areas

Avoid locating hazard sensitive activities and potentially hazard sensitive activities within high hazard areas unless the activity has an operational need or functional need to locate within the high hazard area.

#### NH-P3 Activities in moderate hazard areas

Only allow hazard sensitive activities and potentially hazard sensitive activities within moderate hazard areas where:

- 1. the activity incorporates mitigation measures that demonstrate that risk to people's lives and wellbeing, and building damage is low, and any damage to buildings is minimised;
- 2. people can safely evacuate the property during a natural hazard event; and
- 3. the risk to adjacent properties, activities, and people is not increased as a result of the activity proceeding.

#### NH-P4 Activities in low hazard areas

Provide for hazard sensitive activities and potentially hazard sensitive activities within low hazard areas where:

- 1. the activity incorporates mitigation measures that demonstrate that risk to people's lives
- and wellbeing, and building damage is low, and any damage to buildings is minimised, and
- 2. the risk to adjacent properties, activities, and people is not increased as a result of the activity proceeding.

NH-P5 Less hazard sensitive activities in all hazard areas



Discourage new buildings in flood hazard - overland flow path and ponding areas unless:

- 1. there is no increase in flood flow or level on adjoining sites;
- 2. risk to people's safety will be low;
- 3. the activity incorporates mitigation measures so that the risk of damage to buildings and structures is not significantly increased; and
- 4. people can safely evacuate the property during a natural hazard event.

#### NH-P8 Infrastructure in hazard areas

Allow for the upgrade of existing infrastructure, and only allow new infrastructure to be established in hazard areas where:

- 1. it has an operational need or functional need for the location;
- 2. it will be designed to maintain its integrity and function during and after a natural hazard event, or it will be able to be immediately re-instated after a natural hazard event, and
- 3. the risk to properties, activities, and people is not increased,

NH-P9 Earthworks in flood hazard areas

Provide for earthworks in flood hazard areas where:

- 1. they do not impede flood pathways; and
- 2. the risk to other properties, activities, and people is not increased as a result of the activity proceeding.

#### NH-P11 Precautionary approach

Ensure a precautionary approach is taken in relation to planning for and adapting to the effects of natural hazards caused by climate change and sea level rise on both the natural environment and existing and future development.

According to the Proposed District Plan flood hazard maps, the solar farm extent has both moderate and low areas of flood risk. The proposed solar farm is not a hazard sensitive activity because it is an unmanned facility. The trackers have sufficient height to enable predicted flood water to pass through. The PCUs are important infrastructure that are to be located on higher ground (existing or earthworked). The PCUs are to be positioned at least 50m from the northern extent of the solar farm boundary with the river corridor, and are to be kept out of any overland flow channels.

The proposed design response is considered appropriate and consistent with the direction provided above.

NOISE

#### NOISE-01 Noise Generation

The benefits of activities that generate noise are recognised, where the adverse effects from noise are compatible with the anticipated purpose, character, and amenity values of the relevant zone(s) and do not compromise public health, safety, and wellbeing of people and communities.

NOISE – P1 Enable noise-generating activities in appropriate areas Enable the generation of noise from activities that:

- a. maintain the predominant character and amenity values of the receiving environment by controlling the types of activities and levels of noise permitted in each zone; and
- b. Voo not compromise the health, safety, and wellbeing of people and communities.

NOISE-P2 Ensure noise effects from activities are compatible with the existing environment

Provide for other activities that generate noise, where these avoid, remedy, or mitigate any adverse effects, having regard to:

- a. the extent to which it avoids conflict with existing noise sensitive activities;
- b. whether the level of effects is compatible with the character and amenity of the location and adjacent established activities and their operation;



- c. the compatibility of the noise with other noises generated from permitted zone activities, and other activities not controlled by the Plan, within the receiving zone;
- d. the degree to which the noise breaches the permitted noise standards for the receiving zone(s);
- e. whether adverse effects can be internalised to the site where the noise is generated and the extent to which they can be minimised at site boundaries;
- f. the frequency, intensity, duration, and offensiveness of the noise generated;
- g. any adverse effects on the health, safety, and wellbeing of people and communities within the surrounding area, including sleep disturbance and annoyance;
- h. whether the activity adopts the best practicable option to avoid, remedy, or mitigate adverse effects and the appropriateness of potential mitigation measures to control and monitor the noise levels in addition or as alternatives to the best practicable option through noise management plans or other methods; and
- *i.* potential positive effects associated with the activity which is generating the noise that has a functional need to occur in that location.

NOISE-P3 Minimise noise effects from construction activities

Minimise the adverse effects of noise from construction activities on the amenity values of the surrounding area, having regard to:

- a. the sensitivity of the receiving environment;
- b. the proposed duration and daily work hours of the construction activities; and
- c. whether compliance with permitted noise standards can be practically achieved in consideration of site, topographical, and other constraints.

Section 7.2 of the AEE includes consideration of noise effects, both operational and construction. The acoustic assessment by Marshall Day demonstrates that the proposed solar farm is in line with policy direction above.

GENERAL RURAL ZONE

GRUZ-01 Purpose of the General Rural Zone

The General Rural Zone is used primarily for primary production, activities that support primary production, and other activities that have a functional need or operational need to be located within the General Rural Zone.

GRUZ-O2 Rural Character

The predominant character of the General Rural Zone are maintained and enhanced, which include:

- a. areas of viticulture, crops, pasture, forestry (indigenous and plantation), and the presence of a large number of farmed animals;
- b. sparsely developed landscape with open space between buildings that are predominantly used for agricultural, pastoral and horticultural activities (e.g. barns and sheds), low density rural living (e.g. farmhouses, seasonal worker accommodation, and a small degree of rural lifestyle), and community activities (e.g. rural halls, domains, and schools);
- c. a range of noises, smells, light overspill, and traffic, often on a cyclic and seasonal basis, generated from the production, manufacture, processing and/or transportation of raw materials derived from primary production and ancillary activities;
- d. interspersed existing rural industry facilities associated with the use of the land for intensive primary production, quarrying activities, and cleanfills; and
- e. the presence of rural infrastructure, including rural roads, state highways, the National Grid and the on-site disposal of wastewater, and a general lack of urban infrastructure, such as street lighting, solid fences, and footpaths.

#### GRUZ-O4 Enable Compatible Activities

Primary production activities are enabled, and other activities that have a functional need or operational need to be located within the General Rural Zone are enabled where they are not incompatible with primary production activities.



GRUZ-O7 Protection of highly productive land and other land with special characteristics Recognise and protect:

a. highly productive land; and

b. land that utilises the finite combination of climate and soil characteristics which make it suitable for high value crops including viticulture, orchards and olives.

GRUZ-P1 Compatible Activities

a. Enable primary production activities that are compatible with the purpose, character, and amenity values of the General Rural Zone.

b. Provide for other activities that have a functional need or operational need to be located in the General Rural Zone that are not incompatible with primary production.

c. Provide for rural lifestyle development in appropriate locations where GRUZ-P1(a) and GRUZ-P1(b) are enabled or provided for.

GRUZ-P2 Incompatible Activities

Avoid activities and development that:

a. are incompatible with the purpose, character, and amenity of the General Rural Zone;

b. will result in fragmentation of land and the productive potential of land; or

c. will result in reverse sensitivity effects and/or conflict with permitted activities in the General Rural Zone including primary production and ancillary activities.

GRUZ-P3 Rural Character

Provide for subdivision, use, and development where it does not compromise the purpose, character, and amenity of the General Rural Zone, by:

a. enabling and promoting openness and predominance of vegetation;

b. enabling and promoting a productive working landscape;

c. enabling primary production and ancillary activities;

d. providing for varying forms, scale, and separation of structures associated with primary production activities;

e. managing the density and location of residential development;

f. ensuring allotments can be self-serviced;

g. retaining a clear delineation and contrast between the Wairarapa's rural areas and urban areas; and

h. avoiding, remedying, or mitigating reverse sensitivity effects.

GRUZ-P9 Highly productive land

Avoid subdivision, use and development of highly productive land, except as provided in the National Policy Statement for Highly Productive Land.

The proposed development is compatible with primary production activities, and will, graze sheep in conjunction with the solar farm and not generate reverse sensitivity effects on existing rural and non-rural activities in the surrounding area.

The site is largely LUC6, aside from 1ha of LUC3 included in the extent of the solar farm. The proposed activity has operational need to be located on land adjoining the Masterton substation, and in close proximity to the Powerco 33kV overhead line yet has been designed to avoid majority of the highly productive land.

The removal of 1ha of LUC3 land for use as the solar farm, will have a negligible adverse effect on the potential productive capacity of highly productive land across the Carterton district. Further, the land and soil can be remediated as part of the decommissioning of the solar farm, once the life of the project is complete.

Conclusion on PDP Objectives and Policies

In summary, the direction set by the Proposed District Plan in considering a proposed solar farm activity, within the General Rural Zone is reflected in the information and assessment provided in this application, through the description of the activity in Section 3, the AEE in Section 7 and supporting technical reports in the appendices. Overall, the proposed activity is considered to be consistent with the Proposed Plan.

### Serah Pettigrew

From:	
Sent:	
To:	
Subject:	

Claire Price 57(2)(a) Tuesday, 23 April 2024 12:43 pm Solitaire Robertson; Becca Adams solar farm application - lodged for 51, 99 and 107 Cornwall Road

**Caution:** This email originated from outside the council. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Afternoon Solitaire and Becca,

Could you let me know if the resource consent application for the proposed solar farm at the above address has been allocated to a processing officer yet?

1

Many thanks

CLAIRE PRICE BRP(HONS) MNZPI SENIOR PLANNER

DAYS OF WORK: 8.30AM – 2.30PM MONDAY, TUESDAY, WEDNESDAY, THURSDAY

Mobile 021 712 241 PO Box 239, Napier 4140 www.stradegy.co.nz



This email is intended solely for the use of the addressee and may contain information that is confidential or subject to legal privilege. If you receive this email in error please immediately notify the sender and delete the email.

### Serah Pettigrew

From:	
Sent:	
To:	
Subject:	

Claire Price S / (2)(a) Tuesday, 16 July 2024 9:20 am Solitaire Robertson Re: Report Decision - Cornwall Road - Solar Farm

**Caution:** This email originated from outside the council. Do not click links or open attachments unless you recognize the sender and know the content is safe.

**Thanks Solitaire** 

Get Outlook for iOS

From: Solitaire Robertson <solitaire@cdc.govt.nz> Sent: Tuesday, July 16, 2024 8:52:59 AM To: Claire Price 7/(2)(a) Subject: Report Decision - Cornwall Road - Solar Farm

Hi Claire, draft decision for your perusal

Happy to chat

**Kind Regards** 

Solitaire

### Serah Pettigrew

From: Sent: To: Subject: Attachments: Claire Price S 7(2)(a) Tuesday, 30 July 2024 9:39 am Solitaire Robertson Report Decision - Cornwall Road - Solar Farm draft conditions\_applicant\_comments.docx

**Caution:** This email originated from outside the council. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Morning Solitaire,

Have you considered our modifications to the draft conditions?

Cheers

Claire

From: Claire Price Sent: Tuesday, July 23, 2024 1:43 PM To: Solitaire Robertson <solitaire@cdc.govt.nz> Subject: RE: Invoice for 17/07/2024 from Carterton District Council

HI Solitaire,

Apologies for the delay, please find our review and suggestions for minor modifications, with explanation.

Many thanks

Claire

From: Solitaire Robertson <<u>solitaire@cdc.govt.nz</u>> Sent: Monday, July 22, 2024 12:40 PM To: Claire Price <<u>Claire@stradegy.co.nz</u>> Subject: RE: Invoice for 17/07/2024 from Carterton District Council

Awesome 😊



SOLITAIRE ROBERTSON | Planning & Regulatory Services Manager | CARTERTON DISTRICT COUNCIL

Phone: 06 379 4030 | DDI: 06 379 40 48 | Email: solitaire@cdc.govt.nz

PO Box 9, Carterton 5743 |28 Holloway Street, Carterton 5713 | Website: www.cdc.govt.nz

From: Claire Price S /(2)(a) Sent: Monday, July 22, 2024 12:38 PM To: Solitaire Robertson <<u>solitaire@cdc.govt.nz</u>> Subject: RE: Invoice for 17/07/2024 from Carterton District Council

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Thanks for the clarification. I will have those draft conditions back to you today, if not tomorrow morning.

Claire

From: Solitaire Robertson <<u>solitaire@cdc.govt.nz</u>> Sent: Monday, July 22, 2024 12:36 PM To: Claire Price S7(2)(a) Subject: RE: Invoice for 17/07/2024 from Carterton District Council

Hi Claire, this was the additional processing time above 5 hours,

The peer review one will be coming.

Kind Regards

Solitaire



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Phone: 06 379 4030 | DDI: 06 379 40 48 | Email: solitaire@cdc.govt.nz

PO Box 9, Carterton 5743 |28 Holloway Street, Carterton 5713 | Website: www.cdc.govt.nz

From: Claire Price <<u>Claire@stradegy.co.nz</u>> Sent: Monday, July 22, 2024 10:29 AM **Caution:** This email originated from outside the council. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Solitaire,

Is this invoice for the Boffa landscape peer review? Or was it for the processing by Nick Eagle? Can Masterton Solar Farm Ltd be expect another final invoice?

Thank you

Claire

From: Kate Taylor 5 7(2)(a) Sent: Thursday, July 18, 2024 9:04 AM To: Claire Price 77(2)(a) Subject: FW: Invoice for 17/07/2024 from Carterton District Council

KATE TAYLOR OFFICE AND PROJECT SUPPORT

MOBILE 027 306 9854 PO BOX 239, NAPIER 4140 <u>WWW.STRADEGY.CO.NZ</u>



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From: debtors@cdc.govt.nz <debtors@cdc.govt.nz> Sent: Wednesday, July 17, 2024 3:44 PM To: Kate Taylor 57(2)(a) Subject: Invoice for 17/07/2024 from Carterton District Council

You don't often get email from <u>debtors@cdc.govt.nz</u>. <u>Learn why this is important</u>

Masterton Solar Farm Ltd

Dear Masterton Solar Farm Ltd,

Attached to this email are your invoices for 17/07/2024.



For more news about how the Carterton District Council is working for you, check our website www.cdc.govt.nz.

Thank you for working with us to protect our environment.

Kind Regards, Accounts Receivable Team, Carterton District Council

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Solitaire



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KATE TAYLOR OFFICE AND PROJECT SUPPORT

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You don't often get email from debtors@cdc.govt.nz. Learn why this is important

Masterton Solar Farm Ltd

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Thank you for working with us to protect our environment.

Kind Regards, Accounts Receivable Team, Carterton District Council

<ol> <li>That the activity be undertaken in general accordance with the application and associated documentation including:</li> </ol>	Agree. Standard wording, and use of 'general
<ul> <li>Solar Farm Masterton, Existing Site Plan, Drawing number 23048-EW1 100 Rev A dated 30/06/2023</li> <li>Solar Farm Masterton, Flood Zone Plan, Drawing number 23048-EW1 101 Rev A dated 30/06/2023</li> </ul>	accordance'.
<ul> <li>Solar Farm Masterton, Road Layout Plan, Drawing number 23048-EW1 150 Rev A dated 30/06/2023</li> <li>Solar Farm Masterton, Entrance Layout Plan, Drawing number 23048-EW1</li> </ul>	
<ul> <li>160 Rev A dated 30/06/2023</li> <li>Solar Farm Masterton, Typical Sections and Details, Drawing number 23048-EW1 350 Rev A dated 30/06/2023</li> <li>Assessment of Environmental Effects, Strategy, 16<sup>th</sup> April 2024</li> <li>Civil Infrastructure Assessment, CF Projects Ltd, Feb 2024</li> <li>Landscape and Visual Effects Assessment, Wayfinder, April 2024</li> <li>Transport Assessment Report, ECC, April 2024</li> <li>Acoustic Assessment, Marshall Day, April 2024</li> </ul>	
<ul> <li>Ecological Values Assessment, Forbes Ecology, July 2023</li> <li>Production Capacity Assessment, AgFirst, April 2024</li> <li>Glint and Glare Assessment, Aurecon, April 2024</li> <li>Preliminary Site Investigation, EAM, April 2024</li> </ul>	
<ol> <li>That costs, pursuant to Section 36 of the Resource Management Act 1991, be paid by the applicant.</li> </ol>	Agree, standard wording, Section 36 is <u>Resource Management Act 1991 No 69 (as</u> <u>at 05 June 2024), Public Act 36 Administrative charges –</u> <u>New Zealand Legislation</u>
<ol> <li>The sound level from the activity shall not exceed 55 dba when assessed at any point within the notional boundary of any dwelling on any site within the Rural Zone.</li> </ol>	Delete – double up with requirements in Condition 6 and 7.
4. Hours of operation for construction are limited from 7.30am to 6pm Monday	Modify

to Saturday. No work may be undertaken on a Sunday or a Public Holiday.

Construction activities shall only operate within the hours of Monday to Saturday 5.30 am - 6.30pm, excluding public holidays. On-site work prior to 7.30am Monday to Saturday, or on Sundays, shall be limited to activities that do not involve machinery/impact/drilling such as, but not limited to works involving hand tools only, checking erosion and sediment controls, walking the site and site meetings.

Over the construction period, up to five (5) Sundays can be used for construction activities where the consent holder provides the Team Leader Compliance & Monitoring, Carterton District Council notice of this, at least five (5) working days beforehand and demonstrating compliance with the applicable NZS 6803: 1999 Sunday limits as shown below at the façade of any residential receiver surrounding the site:

 0630 - 0730:
 45dB LAeq / 75dB LAmax

 0730 - 1800:
 55dB LAeq / 85dB LAmax

 1800 - 0630:
 45dB LAeq / 75dB LAmax

Seek flexibility with earlier starts, where activities are limited to quiet activities, and a number of Sunday's for exceptional circumstances.

#### **Detailed Design Process**

5. Prior to construction, the consent holder shall submit the information required in Condition (6) and (7) and have certified by, the Team Leader Compliance and Monitoring, Carterton District Council.	Agree
6. A drawing set detailing:	Agree
a. Internal layout of the solar farm including the:	
i. Location of the internal roads;	
ii. The layout of the solar arrays and setbacks from road frontages,	
property boundaries;	
iii. Location and design of the Power Conversion Units to confirm	

compliance with:	
1. 50m setback from the river corridor; and	
2. Positioned where they will not be impacted by	
modelled flood extents; or	
3. Positioned on earth bunds providing 500mm freeboard	
above the modelled flood depths.	
b. Layout within the Site Compound:	
i. Storage and maintenance buildings;	
ii. 5,000L water tank;	
iii. Up to 4 carparks; and	
iv. Loading bay.	
c. Cross sections of the internal road.	
d. Stormwater management across the site.	
e. Earthworks Plan:	
i. Total volume and area of earthworks;	
ii. Cut and fill heights;	
iii. Extent and detail of trenches;	
iv. Demonstrate how and where surplus material is to be managed	
on site.	
v. Demonstrate that filling within overland flow paths shall not be	
undertaken	-
f. The detailed design should confirm that the location of infrastructure	
will not impact on the modelled 1% AEP flood event.	
7. The final drawing set required in Condition (6) shall ensure compliance	Agree
with the following:	
a. Site access location as consented in RVI Ref 220063;	council needs to update XX with refer number 220063 and
D. Site boundary setbacks as consented in RM Ref 220063;	Tereferice the Marshall Day report.
c. Maximum height of buildings, facilities and structures as set out in the	
Consent RM Rei 220063;	
d. Rural (special) zone night-time holse limits in relation to 573 and 577	

Ň

Hug 202	ghes Line, as identified in the Acoustic Assessment, Marshall Day, April	
e. Ret	ention and maintenance of existing planting on the northwestern indary.	
General accordance		
<ol> <li>The conser general acc updated inf Manageme this resourc</li> </ol>	It holder must construct, operate and maintain the Solar Farm in ordance with application submitted and approved (Ref RM 220063), formation required by Condition $(\pm 5)$ and the certified Construction nt Plan required by Condition $(6 12)$ in fulfilment of the conditions of the consent.	Modify – update condition numbers so it makes sense. This condition is to ensure the requirements in the application and the updated details (condition 5) through design process are reflected in the solar farm which is eventually built, and is constructed as per certified CMP.
9. Prior to co Compliance before work	onstruction, the consent holder must notify the Team Leader e & Monitoring, Carterton District Council at least 20 working days <s commence.<="" farm="" on="" site="" solar="" td="" the=""><td>Agree</td></s>	Agree
<ul> <li>10. Prior to construction, the consent holder shall submit a draft Construction Management Plan (CMP) and have certified by, the Team Leader Compliance and Monitoring, Carterton District Council. The CMP is to cover at minimum the following topic areas: <ul> <li>a. Confirm and demonstrate compliance with New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001);</li> <li>b. Confirm construction activities, staging and scheduling;</li> <li>c. Location of temporary laydown areas;</li> <li>d. Location and treatment of topsoil stockpiles;</li> <li>e. Location and use of erosion and sediment controls;</li> <li>f. Dust management, particularly during summer months;</li> <li>g. Hours of operation;</li> <li>h. Adherence with the New Zealand Standard NZS 6803:1999 <ul> <li>"Acoustics – Construction Noise";</li> <li>i. Accidental discovery protocol – key contacts, processes and procedures to follow;</li> <li>j. Community complaints procedure and contacts;</li> <li>k. Contractor information, role and responsibilities; and a</li> </ul> </li> </ul></li></ul>	Agree	
--	---------------------------	
I. Construction Traffic Management Plan (CTMP).		
<ol> <li>In addition to traffic management, the CTMP required in Condition (10) is to confirm:         <ul> <li>The minor widening works at 51 Cornwall Road access have been approved and completed.</li> <li>The traffic sign, within the existing accessway at 107 Cornwall Road, to remind drivers exiting to watch for vehicles entering the site has been installed.</li> </ul> </li> </ol>	Agree	
12. The CMP must be submitted to the Team Leader Compliance & Monitoring, Carterton District Council for technical certification at least twenty (20) working days before construction works commence on the Solar Farm site.	Modify Add advice note	

	If council has not certified the CMP in <b>Conditions 10</b> and <b>11</b> within the timeframe specified in <b>Condition 12</b> , the obligation to comply with this condition is deemed to have been met and the applicant may proceed with the works in accordance with the submitted plans.
13. Should the Consent Holder be notified that the CMP will not be certified by	Modify
Council within the agreed review period of twenty (20) working days, the Consent Holder must then submit a revised CMP.	Add advice note
	If technical certification is refused under <b>Condition 13</b> , the Consent Holder must then submit a revised CMP following the procedure set out in <b>Conditions 10, 11 and 12</b> .
14Amendments to the CMP and any of its appendices must be certified in	Modify
writing by Team Leader Compliance & Monitoring, Carterton District Council	
following the procedures set out in Conditions 12 and 13.	Suggest this approach to enable minor, yet practical changes to occur without the need for the entire certification process again.
The CMP may be amended or updated without the need for certification where:	
a. <u>The amendment is an administrative change, including nominating</u> <u>personnel / contractors; and</u>	
b. <u>The revised CMP is provided to the Team Leader Compliance &amp;</u> <u>Monitoring, Carterton District Council and,</u>	
c. the changes are more substantial than allowed for in subclause (a), a	
revised CMP is to be sent to the Carterton District Council. The	
Carterton District Council is to advise within 5 working days that the	
amendment CMP must be certified under Condition 12. If no response	

is received within 5 working days the amended CMP can be updated without the need for certification.	
15. The consent holder must ensure that all contractors engaged to undertake activities authorised by this resource consent are supplied with a copy of and made aware of the conditions and management plans that apply to this resource consent that are relevant to their work area and the measures required for compliance with the conditions.	Agree
16. The consent holder must ensure the Solar Farm site is managed in accordance with the certified CMP during the construction period until the Solar Farm site is stabilised (i.e., no longer producing dust, water- borne sediment or potential contaminants).	Agree
17. All disturbed ground surfaces must be adequately surfaced as soon as reasonably possible to limit dust, contaminant or sediment mobilisation.	Agree
18. Dust emissions for construction works must be managed so they do not cause a nuisance beyond the boundary of the Solar Farm site. Dust mitigation measures including but not limited to water carts or sprinklers may be used on any areas of exposed soil.	Agree
19. All loading and unloading of trucks with excavation or fill material must be carried out within the Solar Farm site.	Agree
20. The consent holder must ensure that any debris tracked onto Cornwall Road from construction traffic is cleared from the carriageway as soon as practicable.	Agree

<ul> <li>21. In the event of an archaeological site, waahi tapu or koiwi being discovered or disturbed during the activities authorised by this consent, the consent holder must immediately cease further works in the immediate vicinity of the accidental discovery and inform: <ul> <li>a. Rangitāne o Wairarapa,</li> <li>b. Ngati Kahungunu ki Wairarapa,</li> <li>c. Carterton District Council; and</li> <li>d. Heritage New Zealand Pouhere Taonga (04) 472 4341.</li> </ul> </li> <li>Further work in the immediate vicinity of the accidental discovery must be suspended while iwi carry out their procedures for removal of taonga. The Carterton District Council's Manager Regulatory Services will advise the consent holder when work in the Solar Farm site may recommence.</li> <li>In the event that human remains (koiwi) are found the New Zealand Police must be contacted immediately and all works must cease until the Carterton District Council's Manager Regulatory Services advises that works can recommence.</li> </ul>	Agree
NZECP Compliance	
22. All land use activities including the construction of new buildings/structures, earthworks, fences, any operation of mobile plant and/or persons working near exposed line parts must comply with the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001) or any subsequent revision of the code.	Agree
Flood Management Plan	
<ul> <li>23. Prior to the operation of the solar farm, a flood hazard management plan shall be developed for the site, and will detail the following:</li> <li>a) monitoring of inclement weather,</li> <li>b) positioning of panels in optimal orientation during flooding to allow water to pass safely during flood events; and</li> <li>c) maintenance of swales and/or overland flow paths.</li> </ul>	Agree This was offered up.
Decommissioning	

N

24. At leas the So the Te	st three months prior to the commencement of decommissioning of lar Farm, the consent holder must submit a Decommissioning Plan to cam Leader Compliance & Monitoring, Carterton District Council for	Agree We offered this -up
	cation that it fulfils the requirements of the following conditions.	
25. The De	ecommissioning Plan must be prepared by a suitably qualified and	Winor modifications so that land is remediated to current ru
a.	Decommissioning of the solar panels and all associated infrastructure in a manner that complies with all legislative requirements;	pastoral state, not a future unknown state.
b.	Leaving the land in a condition that is safe and suitable for the subsequent rural pastoral land use; and	
c.	Ensuring that the components and infrastructure are disposed of in a way that maximises re-use and recycling. For any parts that cannot be reused or recycled, ensuring that they are disposed of in an environmentally responsible way in accordance with industry best practice.	
26. The De	ecommissioning Plan must include but not be limited to:	
a.	Details on all infrastructure to be decommissioned, including details, method and location of reuse, recycling or disposal and the reasons why the options have been chosen;	
b.	Details of specific infrastructure to remain on-site post- closure and reasons why it will remain on Solar Farm site;	
с.	Scheduling and timing for decommissioning; and	
d.	Details for finished ground cover at completion of decommissioning and future intended rural pastoral land use.	

27. The earthworks associated with the proposed activity must not alter the configuration of an existing overland flow path i.e., the works must maintain

the same route of the overland flow path, maintain the same entry, and ex	it
point at the site boundary, and not alter the volume and velocity of wat	er
flow. Earth and other material stockpiles must not be stored within a	n
existing overland flow path.	
28. Erosion and sediment control (ESCP) measures must be implemented for the	e Delete
duration of the activity. The measures must be installed prior to the	e
commencement of earthworks and maintained until the site is stabilise	d Earthworks consent from the Greater Wellington Regional Council
against erosion.	covers all erosion sediment control measures and their
	installation, stabilization and so on.
29. The consent holder shall take all practicable steps to minimise sedime	t Delete
loading due to the works, by ensuring all stormwater and water discharge	d
from the construction activities is directed to an erosion and sedime	t Earthworks consent from the Greater Wellington Regional Council
control measure or device prior to discharge.	covers all erosion sediment control measures and their design,
	installation, stabilization and so on.
WATER RACES	
30. The consent holder shall submit an application to Carterton District Coun for planting any trees and shrubs within 10m of a water race. Permission plant trees and shrubs shall only apply to the species outlined in t application. The application form titled; Carterton District Council Wat	<ul> <li>Noted. Although no planting is proposed .</li> <li>Noted. Although no planting is proposed .</li> <li>Suggest this becomes an advice note.</li> </ul>
Race Alteration Application can be found on the Council's website. A nor refundable administration fee will be calculated and payable at the time such an application.	n- of
31. Plant species such as pinus radiata, poplar and willow will not be permitt	ed Noted. Although no planting is proposed.
within 10m of the water race. A list of acceptable trees and shrubs that c be planted within 10m of a water race is outlined in the document titl Guidelines for Water Race Property Owners and is available on the Counci website.	an ed Suggest this becomes an advice note. 's
32. The position of the proposed electrical kiosk building adjacent to the Tarata	hi Seek modification to enable a conversation with Carterton DC if
water race shall be such that the outer edge of the foundation structure is	at the final design of the kiosk needs to be closer than 2m to the
a distance of minimum 2 metres when measured from the top of ba	nk water race.
breakline associated with water race channel. Any kiosk design that does n	<u>ot</u>

meet the 2 metre setback is to be considered by Council under Condition 33.	
33. The consent holder shall provide Council detailed design drawings for managing the potential conflict between Taratahi water race and any proposed underground utility structures (e.g. ducting, pull pits or similar) associated with the electrical kiosk building. Construction activities associated with the electrical kiosk building shall not commence until the Council has provided acceptance of the detailed design drawings.	Agree.
TRAFFIC AND VEHICLE ACCESS	
34. Temporary construction traffic entering and departing from Cornwall Road shall be directed west towards the State Highway 2 corridor as an entry and exit route to minimise impact on traffic loads on Hughes Line.	Agree Checked TAR – based on maximizing traffic to/from SH2.
35. Redirection of temporary construction traffic on Hughes Line shall only be permitted in emergency circumstances or temporary road closures on State Highway 2.	Agree Checked TAR – based on maximizing traffic to/from SH2.
36. Prior to commencing any work and activities in the road corridor, the consent holder shall obtain a Work Access Permit (WAP) from the Council's Corridor Manager through submission of a complete Corridor Access Request (CAR).	Agree

# **Document 7**

# Serah Pettigrew

From: Sent: To: Subject: Attachments: Solitaire Robertson Thursday, 1 August 2024 9:52 am Claire Price consent decision 240014 Report Decision - Cornwall Road - Solar Farm.pdf

Hi Claire, here is the decision, I have accepted all your recommendation.

Good luck with the project

**Kind Regards** 

Solitaire



SOLITAIRE ROBERTSON | Planning & Regulatory Services Manager | CARTERTON DISTRICT COUNCIL

Phone: 06 379 4030 | DDI: 06 379 40 48 | Email: solitaire@cdc.govt.nz

PO Box 9, Carterton 5743 |28 Holloway Street, Carterton 5713 | Website: www.cdc.govt.nz



# **CARTERTON DISTRICT COUNCIL**

# APPLICATION FOR RESOURCE CONSENT UNDER SECTION 88 OF RESOURCE MANAGEMENT ACT 1991

Application No:	240014
Consent Type:	Landuse
Applicant:	Masterton Solar Farm Ltd
Proposal:	Construct and operate a 25ha solar farm.
Location:	51, 99 & 107 Cornwall Road, Masterton
Legal Description:	Lot 2 DP 325931, Lot 1 DP 75496, Lot 2 DP 88515
Zone:	Rural (Special) – Operative Wairarapa Combined District Plan 2011
	General Rural Zone – Proposed Wairarapa Combined District Plan
Management Area:	Flood hazard area, noise contours, airport obstacle limitation surfaces. Flood Hazard Area including ponding, overland flow and river corridor, possible liquefaction prone area. The airport obstacle limitation surfaces.
Activity Status:	Wairarapa Combined District Plan
	Discretionary Activity



Consent: 240014

4

## DECISION

That the Carterton District Council hereby grants consent, to application no. 220063 pursuant to Section 104A of the Resource Management Act 1991, subject to the following conditions:

#### CONDITIONS

#### That;

- 1. That the activity be undertaken in general accordance with the application and associated documentation including:
  - Solar Farm Masterton, Existing Site Plan, Drawing number 23048-EW1 100 Rev A dated 30/06/2023
  - Solar Farm Masterton, Flood Zone Plan, Drawing number 23048-EW1 101 Rev A dated 30/06/2023
  - Solar Farm Masterton, Road Layout Plan, Drawing number 23048-EW1 150 Rev A dated 30/06/2023
  - Solar Farm Masterton, Entrance Layout Plan, Drawing number 23048-EW1 160 Rev A dated 30/06/2023
  - Solar Farm Masterton, Typical Sections and Details, Drawing number 23048-EW1 350 Rev A dated 30/06/2023
  - Assessment of Environmental Effects, Strategy, 16<sup>th</sup> April 2024
  - Civil Infrastructure Assessment, CF Projects Ltd, Feb 2024
  - Landscape and Visual Effects Assessment, Wayfinder, April 2024
  - Transport Assessment Report, ECC, April 2024
  - Acoustic Assessment, Marshall Day, April 2024
  - Ecological Values Assessment, Forbes Ecology, July 2023
  - Production Capacity Assessment, AgFirst, April 2024
  - Glint and Glare Assessment, Aurecon, April 2024
  - Preliminary Site Investigation, EAM, April 2024
- 2. That costs, pursuant to Section 36 of the Resource Management Act 1991, be paid by the applicant.
- Construction activities shall only operate within the hours of Monday to Saturday 5.30 am - 6.30pm, excluding public holidays. On-site work prior to 7.30am Monday to Saturday, or on Sundays, shall be limited to activities that do not involve machinery/impact/drilling such as, but not limited to works involving hand tools only, checking erosion and sediment controls, walking the site and site meetings.

Over the construction period, up to five (5) Sundays can be used for construction activities where the consent holder provides the Team Leader Compliance & Monitoring, Carterton District Council notice of this, at least five (5) working days beforehand and demonstrating compliance with the applicable NZS 6803: 1999 Sunday limits as shown below at the façade of any residential receiver surrounding the site:

 0630 - 0730:
 45dB LAeq / 75dB LAmax

 0730 - 1800:
 55dB LAeq / 85dB LAmax

 1800 - 0630:
 45dB LAeq / 75dB LAmax

## **Detailed Design Process**

- 4. Prior to construction, the consent holder shall submit the information required in Condition (6) and (7) and have certified by, the Team Leader Compliance and Monitoring, Carterton District Council.
- 5. A drawing set detailing:
  - a. Internal layout of the solar farm including the:
    - i. Location of the internal roads;
    - ii. The layout of the solar arrays and setbacks from road frontages, property boundaries;
    - iii. Location and design of the Power Conversion Units to confirm compliance with:
      - 1. 50m setback from the river corridor; and
      - 2. Positioned where they will not be impacted by modelled flood extents; or
      - 3. Positioned on earth bunds providing 500mm freeboard above the modelled flood depths.
  - b. Layout within the Site Compound:
    - i. Storage and maintenance buildings;
    - ii. 5,000L water tank;
    - iii. Up to 4 carparks; and
    - iv. Loading bay.
  - c. Cross sections of the internal road.
  - d. Stormwater management across the site.
  - e. Earthworks Plan:
    - i. Total volume and area of earthworks;
      - ii. Cut and fill heights;
      - iii. Extent and detail of trenches;
      - iv. Demonstrate how and where surplus material is to be managed on site.
      - v. Demonstrate that filling within overland flow paths shall not be undertaken
  - f. The detailed design should confirm that the location of infrastructure will not impact on the modelled 1% AEP flood event.
- 6. The final drawing set required in Condition (6) shall ensure compliance with the following:
  - a. Site access location as consented in RM Ref 240014;
  - b. Site boundary setbacks as consented in RM Ref 240014;
  - c. Maximum height of buildings, facilities and structures as set out in the consent RM Ref 240014;
  - d. Rural (Special) Zone night-time noise limits in relation to 573 and 577 Hughes Line, as identified in the Acoustic Assessment, Marshall Day, April 2024
  - e. Retention and maintenance of existing planting on the northwestern boundary.

## **General accordance**

The consent holder must construct, operate and maintain the Solar Farm in general accordance with application submitted and approved (Ref RM 240014), updated information required by Condition (5) and the certified Construction Management Plan required by Condition (12) in fulfilment of the conditions of this resource consent.

7.

 Prior to construction, the consent holder must notify the Team Leader Compliance & Monitoring, Carterton District Council at least 20 working days before works on the Solar Farm site commence.

## **Construction Management**

- 9. Prior to construction, the consent holder shall submit a draft Construction Management Plan (CMP) and have certified by, the Team Leader Compliance and Monitoring, Carterton District Council. The CMP is to cover at minimum the following topic areas:
  - a. Confirm and demonstrate compliance with New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001);
  - b. Confirm construction activities, staging and scheduling;
  - c. Location of temporary laydown areas;
  - d. Location and treatment of topsoil stockpiles;
  - e. Location and use of erosion and sediment controls;
  - f. Dust management, particularly during summer months;
  - g. Hours of operation;
  - h. Adherence with the New Zealand Standard NZS 6803:1999 "Acoustics Construction Noise";
  - Accidental discovery protocol key contacts, processes and procedures to follow;
  - j. Community complaints procedure and contacts;
  - k. Contractor information, role and responsibilities; and a
  - I. Construction Traffic Management Plan (CTMP).
- 10. In addition to traffic management, the CTMP required in Condition (10) is to confirm:
  - a. The minor widening works at 51 Cornwall Road access have been approved and completed.
  - b. The traffic sign, within the existing accessway at 107 Cornwall Road, to remind drivers exiting to watch for vehicles entering the site has been installed.
- 11. The CMP must be submitted to the Team Leader Compliance & Monitoring, Carterton District Council for technical certification at least twenty (20) working days before construction works commence on the Solar Farm site. (see advice note 5)
- 12. Should the CMP not be certified by Council within the agreed review period of twenty (20) working days, the Consent Holder must then submit a revised CMP. CMP.
- 13. The CMP may be amended or updated without the need for certification where:
  - a) The amendment is an administrative change, including nominating personnel / contractors; and
  - b) The revised CMP is provided to the Team Leader Compliance & Monitoring, Carterton District Council and,
  - c) the changes are more substantial than allowed for in subclause (a), a revised CMP is to be sent to the Carterton District Council. The Carterton District Council is to advise within 5 working days that the amendment CMP must be certified under Condition 12. If no response is received within 5 working days the amended CMP can be updated without the need for certification.

- 15. The consent holder must ensure that all contractors engaged to undertake activities authorised by this resource consent are supplied with a copy of and made aware of the conditions and management plans that apply to this resource consent that are relevant to their work area and the measures required for compliance with the conditions.
- 16. The consent holder must ensure the Solar Farm site is managed in accordance with the certified CMP during the construction period until the Solar Farm site is stabilised (i.e., no longer producing dust, water- borne sediment or potential contaminants).
- 17. All disturbed ground surfaces must be adequately surfaced as soon as reasonably possible to limit dust, contaminant or sediment mobilisation.
- 18. Dust emissions for construction works must be managed so they do not cause a nuisance beyond the boundary of the Solar Farm site. Dust mitigation measures including but not limited to water carts or sprinklers may be used on any areas of exposed soil.
- 19. All loading and unloading of trucks with excavation or fill material must be carried out within the Solar Farm site.
- 20. The consent holder must ensure that any debris tracked onto Cornwall Road from construction traffic is cleared from the carriageway as soon as practicable.
- 21. In the event of an archaeological site, waahi tapu or koiwi being discovered or disturbed during the activities authorised by this consent, the consent holder must immediately cease further works in the immediate vicinity of the accidental discovery and inform:
  - a. Rangitāne o Wairarapa,
  - b. Ngati Kahungunu ki Wairarapa,
  - c. Carterton District Council; and
  - d. Heritage New Zealand Pouhere Taonga (04) 472 4341.

Further work in the immediate vicinity of the accidental discovery must be suspended while iwi carry out their procedures for removal of taonga. The Carterton District Council's Manager Regulatory Services will advise the consent holder when work in the Solar Farm site may recommence.

In the event that human remains (koiwi) are found the New Zealand Police must be contacted immediately and all works must cease until the Carterton District Council's Manager Regulatory Services advises that works can recommence.

## NZECP Compliance

22. All land use activities, including the construction of new buildings/structures, earthworks, fences, any operation of mobile plant and/or persons working near exposed line parts must comply with the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001) or any subsequent revision of the code.

## Flood Management Plan

23. Prior to the operation of the solar farm, a flood hazard management plan shall be developed for the site, and will detail the following:

- a. monitoring of inclement weather,
- b. positioning of panels in optimal orientation during flooding to allow water to pass safely during flood events; and
- c. maintenance of swales and/or overland flow paths.

#### Decommissioning

- 24. At least three months prior to the commencement of decommissioning of the Solar Farm, the consent holder must submit a Decommissioning Plan to the Team Leader Compliance & Monitoring, Carterton District Council for certification that it fulfils the requirements of the following conditions.
- 25. The Decommissioning Plan must be prepared by a suitably qualified and experienced person and meet the following objectives:
  - a. Decommissioning of the solar panels and all associated infrastructure in a manner that complies with all legislative requirements;
  - b. Leaving the land in a condition that is safe and suitable for therural pastoral land use; and
  - c. Ensuring that the components and infrastructure are disposed of in a way that maximises re-use and recycling. For any parts that cannot be reused or recycled, ensuring that they are disposed of in an environmentally responsible way in accordance with industry best practice.
- 26. The Decommissioning Plan must include but not be limited to:
  - a. Details on all infrastructure to be decommissioned, including details, method and location of reuse, recycling or disposal and the reasons why the options have been chosen;
  - b. Details of specific infrastructure to remain on-site post-closure and reasons why it will remain on Solar Farm site;
  - c. Scheduling and timing for decommissioning; and
  - d. Details for finished ground cover at completion of decommissioning and future rural pastoral land use.

## INFRASTRUCTURE - GENERAL

- 27. The earthworks associated with the proposed activity must not alter the configuration of an existing overland flow path i.e., the works must maintain the same route of the overland flow path, maintain the same entry, and exit point at the site boundary, and not alter the volume and velocity of water flow. Earth and other material stockpiles must not be stored within an existing overland flow path.
- 28. .

## WATER RACES

29. The consent holder shall submit an application to Carterton District Council for planting any trees and shrubs within 10m of a water race. Permission to plant trees and shrubs shall only apply to the species outlined in the application. The application form titled; Carterton District Council Water Race Alteration Application can be found on the Council's website. A non-refundable administration fee will be calculated and payable at the time of such an application.

**30.** Plant species such as pinus radiata, poplar and willow will not be permitted within 10m of the water race. A list of acceptable trees and shrubs that can be planted within 10m of a water race is outlined in the document titled Guidelines for Water Race Property Owners and is available on the Council's website.

- 31. The position of the proposed electrical kiosk building adjacent to the Taratahi water race shall be such that the outer edge of the foundation structure is at a distance of minimum 2 metres when measured from the top of bank breakline associated with water race channel. <u>Any kiosk design that does not meet the 2 metre setback is to be considered by</u> Council under Condition 32.
- 32. The consent holder shall provide Council detailed design drawings for managing the potential conflict between Taratahi water race and any proposed underground utility structures (e.g. ducting, pull pits or similar) associated with the electrical kiosk building. Construction activities associated with the electrical kiosk building shall not commence until the Council has provided acceptance of the detailed design drawings.

## TRAFFIC AND VEHICLE ACCESS

- 33. Temporary construction traffic entering and departing from Cornwall Road shall be directed west towards the State Highway 2 corridor as an entry and exit route to minimise impact on traffic loads on Hughes Line.
- 34. Redirection of temporary construction traffic on Hughes Line shall only be permitted in emergency circumstances or temporary road closures on State Highway 2.
- 35. Prior to commencing any work and activities in the road corridor, the consent holder shall obtain a Work Access Permit (WAP) from the Council's Corridor Manager through submission of a complete Corridor Access Request (CAR).

## **Advice Notes**

- 1. Work within road reserve, underground or overhead, must have approval in writing from the administering authority, in this instance Council. *Note: The road reserve is that section of land sandwiched between legally defined private property boundaries and it includes the grassed berms, footpaths and the carriageway*
- 2. The consent holder may require a building consent for the installation of new stormwater and wastewater infrastructure associated with any site offices proposed to be located within the property boundaries.
- 3. The consent holder may consider applying for the abstraction of water from the Taratahi water race for the purposes of storing water for fire emergency, irrigation or any other non-potable water use. To initiate the request for a new water abstraction point from the Taratahi water race, the consent holder can submit an application using the relevant form(s) from the Council's website. The consent holder shall comply with the terms and conditions imposed by Council at the time of such an application.
- 4. Notwithstanding acceptance of the resource consent application and subsequent engineering designs by Carterton District Council, the consent holder remains responsible for reviewing the proposed activity against other regional plans, policies and rules provided by Greater Wellington Regional Council. Acceptance of any design or resource consent granted by Carterton District Council does not transfer any responsibility to Carterton District Council or provide any assurance that the activity complies with other Regional plans, policies, and rules.

- 5. If council has not certified the CMP in **Conditions 10** and **11** within the timeframe specified in **Condition 12**, the obligation to comply with this condition is deemed to have been met and the applicant may proceed with the works in accordance with the submitted plans.
- 6. If technical certification is refused under **Condition 13**, the Consent Holder must then submit a revised CMP following the procedure set out in **Conditions 10**, **11 and 12**.

## The Council grants the Consent for the following reasons:

- i) The effects of the proposal, with the conditions imposed, are considered to be less than minor.
- ii) The proposal is in accordance with the objectives and policies of the Wairarapa Combined District Plan, and with the purpose of the Act.
- iii) No parties are considered to be adversely affected by the proposal.

#### SECTION 42A REPORT

#### 1.0 APPLICATION

## <u>Site</u>

The site comprises three titles of land at 51, 99 and 107 Cornwall Road, and has an area 65.8ha

The site has frontage to Cornwall Road to the south-west and State Highway 2 to the north. The Waingawa River is on the north-eastern boundary and the Masterton substation to the south.

The extent of the proposed solar farm is a portion of the larger site area of 25ha and largely confined to the lower terrace, adjoining the Waingawa River, and set back from the river between 25m - 75m.

The legal description of the property is Lot 2 DP 325931, Lot 1 DP 75496, Lot 2 DP 88515. There are no interests on the titles that restrict or prevent the proposed activity

The three connections that extend from the solar farm are for access and cable connections. The vehicle access and roads/tracks into the site already exist and are used by the existing farm and contracting business that operate at the site. The permanent access will extend from 107 Cornwall Road driveway and enter 99 Cornwall Road and follow the fence line with 107 Cornwall Road.

The landowner leases the properties at 51 and 99 Cornwall Road in conjunction with other land and the site is currently used for cattle grazing. The 2.6ha property at 107 Cornwall Road supports rural industrial activities.

Over the two terraces within the site, the upper terrace on the southern side is largely land use capacity #3 (LUC 3), whereas the lower terrace adjoining the Waingawa River is LU6. The lower terrace is the location of the proposed solar farm, with ancillary activities (cable corridor and internal access road) extending through the upper terrace to connect to Cornwall Road.

The site has frontage to Cornwall Road, Hughes Line and SH2. The Transpower NZ Limited (Transpower) Masterton substation is located immediately south and directly abuts the subject site. Overhead lines connect to the Masterton substation and traverse the north-west end of the subject site.

The site is zoned Special Rural under the Operative Combined Wairarapa District Plan and is within the flood hazard area. There are also noise contours on site as well as partly within the airport obstacle limitation surfaces.

The Proposed Combined Wairarapa District Plan (the Proposed Plan) zones the site as General Rural Zone and shows the high voltage overhead lines on the planning maps. Flood Hazard Area including ponding, overland flow and river corridor are shown on site. It is also a possible liquefaction prone area. The airport obstacle limitation surfaces cuts across 107 Cornwall Road.

The Operative and Proposed District Plan maps identify the proposed solar farm site is within a flood hazard area. The Operative District Plan includes flood risk maps prepared by Greater Wellington Regional Council (GWRC) which shows where land is likely to be subject to 1:50 year (2% Annual Exceedance Probability (AEP)) and 1:100 year (1% AEP) floods. The Proposed District Plan flood hazard maps, (Upper Raumāhanga) are based on Greater Wellington Regional Council's data produced for the Floodplain Management Plans for these rivers. These maps also delineate between stream corridor, overland flow path and ponding hazard areas.

#### **Proposal**

The applicant, Masterton Solar Farm Ltd, seeks land use consent for the construction, operation, and maintenance of a proposed solar farm at 51, 99 and 107 Cornwall Road, Masterton.

The scale of the proposed solar farm enables the generation of circa 12.5MW(AC) of renewable electricity which is equivalent to powering approximately 4,000 homes with the electricity generated supplying the National Grid.

The extent of the solar farm is approximately 25ha in area, and this area will be occupied by solar arrays (solar panels and trackers). A deer fence shall run the perimeter of the proposed extent and shall not exceed 1.8m. Security cameras will be installed pointing nose to tail on the perimeter fence as a precautionary security measure.

The solar farm does not front any roads, except for an underground 33kV cable route corridor between the proposed solar farm and Cornwall Road and a kiosk building. The proposed solar farm avoids any buildings within 20m of the Transpower overhead lines.

The proposed solar farm is designed to enable sheep grazing to occur at the site. The dual use of sheep grazing and operating a solar farm is termed 'agrivoltaics' and has benefits to both activities.

The scale and form of the proposed solar farm includes the structures, facilities and ancillary activities as follows:

• A site compound (a level metalled area).

The site compound is an open area, free of any solar array infrastructure and will have maintenance and storage buildings being shipping containers. It will have a 5,000- 10,000L water tank. Four onsite car parks are to be provided and a loading area to facilitate on site manoeuvring.

• Grid connection point circuit breaker kiosk building.

The Kiosk building is to be 3m x 3m x 2m and will be sited on the frontage with Cornwall Road. It is to house the 33KV circuit breaker and takes electricity from the solar farm into the Masterton Substation.

• Solar panels and single axis tracking system.

The solar panels are 1.1m wide by 2.5m in height with the number of panels ranging between 25,000- 35,000. The row of panels will be laid out north-to-south alignment with 6m corridor between each row of solar panels. The corridors between the panels will remain in pasture. The tracker system has the ability to rotate the solar panels during the day.

• Power Conversion Units (PCUs).

The electrical collection and conversion systems, including inverter and transformer units, are referred to as Power Conversion Units (PCU's). PCUs convert the DC electricity collected from the solar array into AC electricity, increase the voltage to match the 33kV distribution grid voltage, and then export the 33kV electricity into the local distribution network via the nearest 33kV overhead line that is then connected to the Masterton substation. PCUs are skid mounted on a raised concrete pad or pile with footprint of circa 40ft x 10ft. The maximum height of these facilities above the existing ground level will not exceed 4m.

The proposed solar farm is to accommodate up to six PCUs across the site. The final number and locations of the PCUs will be confirmed as part of detailed design.

- Electrical equipment including cabling above and below ground and including weather stations.
- Site Access, Internal Roads.

An existing vehicle access at 107 Cornwall Road, located south-west of the proposed solar farm, is to be used during the operation of the proposed solar farm. The are also to be internal roads for use during the operation of the solar farm. The final layout will be confirmed at a detailed design stage. The internal roads will have a formed width of 4m with a compacted and gravelled surface.

• Retention of existing vegetation.

The retention of the existing shelterbelt which runs almost continuously along the western border of the proposed site. Along with the hedgerow which runs parallel to State Highway 2 along the northern border of the proposed site. No further visual mitigation is proposed, as recommended by Wayfinder in the visual landscape assessment.

#### Operations

The proposed solar farm will be an unmanned operation therefore no site office or staff facilities are required.

The proposed solar farm when it is operational, is expected to generate less than 10 vehicle movements per day. This is based on the following:

• Up to two staff (light vehicles) will arrive and leave site between 8am – 5pm, Monday – Friday, and

• The infrequent arrival / departure of heavy vehicles to site – as and when new replacement components are required to be delivered.

Noise has been measured and assessed in accordance with NZS6801/6802:2008 and applies within the notional boundary of any dwelling in the Rural Zone. The proposed solar farm can operate

within the noise limits set by the Operative District Plan and a condition of consent is offered up requiring confirmation of compliance as part of the approved detailed design.

The proposed solar farm is designed to enable sheep grazing to occur at the site.

The expected lifetime of the solar farm is 40 years. At the end of this period the facilities will be decommissioned and the site rehabilitated to pasture and paddocks.

#### Construction

An overall construction duration period has been approximated at 12 months.

The site access during construction will be the use of two points of access onto Cornwall Road:

- 51 Cornwall Road; and
- 107 Cornwall Road.

These two access points are to be used as a one way circulation for construction vehicles.

The site traffic during the construction activities is expected to be 112 vehicle movements per day. It is predicted that all construction works can readily comply with the noise limits considered appropriate as set out New Zealand Standard NZS 6803: 1999 Acoustics Construction Noise.

The construction activities include earthworks to prepare and construct the following:

- site accesses to the appropriate standard;
- internal roads;
- trenching for buried cables;
- building up any platform areas to locate the PCUs;
- temporary construction laydown areas; and
- prepare the site compound area.
- The total volume of earthworks is estimated as 2,700m<sup>3</sup>.

#### Activity Status

**Operative District Plan** 

The site is within the Special Rural Zone.

The following overlays and planning notations applying in varying ways across the site:

o Transpower's National transmission line corridor traverses the site in diagonal from south to north-west.

o Flood Hazard Area associated with the Waingawa River

o Airport approach path crosses over the existing access to be used at 107 Cornwall Road

Consent Requirements:

District-Wide Rules (Section 21)

1. Discretionary activity for a new renewable energy generation activity under Rule 21.6(a).

2. Restricted Discretionary Activity for earthworks and non-habitable structures within the Flood Hazard Area under Rule 21.4.7

Rural Zone

3. Restricted Discretionary activity under Rule 4.5.5(c) for an activity that is not primary production or residential purposes where buildings of greater than 25m2 in gross floor area are proposed. It is understood that this rule applies as the interpretation is that while the tracking system and solar panels do not have a 'floor area', they still meet the definition of 'building' and in total, are greater in area than 25m2.

4. Restricted Discretionary activity under Rule 4.5.5(e) where the on-site carparking and access designs do not comply with the standards set out in Appendix 5.

Proposed District Plan (PDP)

The site is within the General Rural Zone.

The following overlays and planning notations applying in varying ways across the site: o Transpower's National transmission line 110kV corridor traverses the site in diagonal from south to north-west.

o Flood Hazard Areas (High, Moderate and Low) associated with the Waingawa River o Airport approach path crosses over the existing access to be used at 107 Cornwall Road o Possible liquefaction prone area

The rules pertaining to the General Rural Zone, Natural Hazards, and Energy do not trigger any aspects of the rules that have been given immediate legal effect, so no resource consents are required under the PDP.

**Overall Activity Status** 

Overall, the application is to be assessed as a Discretionary Activity under Rules 21.6(a), 21.4.7, 4.5.5(c) and 4.5.5(e) of the Operative District Plan.

## 2.0 S95A – 95F NOTIFICATION ANALYSIS AND DETERMINATION

## 2.1 Public Notification

1: Mandatory Public Notification (s95A Step 1)

Public Notification is required when the application meets any of the following criteria;

- The applicant has requested public notification,
- Public notification is required under s95C of the Act (relating to a requests for further information),
- The application been made jointly with an application to exchange recreation reserve land under section 15AA of the Reserves Act.

The above provisions do not apply to this proposal.

## 2: Public notification precluded in certain circumstances (s95A Step 2)

If not required by Step 1 above, Public Notification is precluded in certain circumstances when the application meets either of the following criteria;

- All activities in the application are subject to one or more rules or national environmental standards that preclude public notification.
- The application is for one or more of the following, but no other, types of activities:
  - a controlled activity,
  - a restricted discretionary, discretionary activity or non-complying activity that is a boundary activity,

The application is for none of the above and as such is not precluded under step 2.

## 3: Public notification required in certain circumstances (s95A Step 3)

If not precluded in Step 2 above, Public Notification is required in certain circumstances when the application meets either of the following criteria;

- Any activity in the application is subject to a rule or national environmental standard that requires public notification,
- The activity has, or is likely to have, adverse effects on the environment that are more than minor in accordance with s95D of the Act.

The application is for a discretionary activity the application has demonstrated that it is not anticipated that the proposed Solar Farm will have any adverse effects on the environment which are more than minor. As such public notification is also precluded under step 3.

## 4: Public notification in special circumstances (s95A Step 4)

If special circumstances exist in relation to the application that warrant public notification then the application must be publicly notified.

No special circumstances have been identified that would warrant public notification of the application.

## 2.2 Limited Notification

If public notification is not required, the Council must then determine whether there are any affected persons that would warrant limited notification under Section 95B(1).

## 1: Certain affected groups and affected persons must be notified (s95B Step 1)

An application shall be notified to each affected person/group if it meets any of the following criteria;

- There are affected protected customary rights groups,
- There are affected customary marine title groups (in the case of an application for a resource consent for an accommodated activity),
- The proposed activity is on or adjacent to, or may affect, land that is the subject of a statutory acknowledgement made in accordance with an Act specified in Schedule 11 of the Act; and the person to whom the statutory acknowledgement is made is affected under s95E of the Act.

The above provisions do not apply to this proposal.

## 2: Limited notification precluded in certain circumstances (s95B Step 2)

If not required by Step 1 above, Limited Notification is precluded in certain circumstances when the application meets either of the following criteria;

- All activities in the application are subject to one or more rules or national environmental standards that preclude limited notification.
- The application is for either or both of the following, but no other activities:
  - a controlled activity, that requires consent under a district plan (other than a subdivision)
  - an activity prescribed by regulations made under section 360H(1)(a)(ii) of the Act (if any) precluding limited notification

The above provisions do not apply to this proposal, therefore Step 3 below must be considered.

## 3. Certain other affected persons must be notified (s95B Step 3)

If not precluded by Step 2 above, the following affected persons must be notified;

- In the case of a boundary activity, an owner of an allotment with an infringed boundary
- A person prescribed in regulations made under s360H(1)(b) of the Act (if any) in respect
   of the proposed activity
- For other activities, "affected persons" under s95E of the Act.

Under Section 95(E) of the Act, Council must consider a person to be affected if the activity's adverse effects on that person are minor or more than minor unless an activity with that effect is permitted by a Rule or NES, the effect is not within the matters of control or discretion or that person has given written approval to the proposed activity. No written approval have been received.

The applicant has provided an Assessment of Environmental Effects, with associated documents including CF Projects Civil Assessment, Wayfinder Landscape and Visual Assessment, ECC: Transport Assessment Report, Marshall Day Acoustic Assessment, Forbes Ecology Ecological Values Assessment, AgFirst Production Capacity Assessment, Aurecon: Glint and Glare Assessment and EAM PSI Assessment assessing the proposed Solar Farm. Any adverse effect on the open rural character and amenity of the surrounding area are considered to be less than minor.

In terms of a permitted baseline, it is considered there are other rural primary production activities which could have a similar visual impact on the environment as the proposed solar farm. This could include such activities as the netting over an orchard or large rural sheds.

Views of the site itself are relatively restricted. Existing mature shelter belts provide screening for the majority of the proposal leaving only fleeting glimpses of the site for the casual traveller along SH2 or Cornwall Road representing a small portion of a wider journey across the landscape.

For dwellings in the immediate and more distant locality, visual effects are considered to be low to very-low. Oblique views, existing screening by foreground elements and the visually dominant Tararua Ranges will likely result in the panels being a small portion (if seen at all) of the general outlook from these properties.

The effects of the proposed solar farm and the measures available to avoid and reduce effects of flooding on the site will not worsen for properties and people nearby, the use of the land within the flood hazard zone is considered appropriate with less than minor adverse effects on adjacent properties. Further no other Natural Hazards have been identified which will adversely impact adjacent properties through the presence / construction of proposed Solar farm.

Construction, noise, traffic and associated effects will all to be rural standards. Given the above the adjacent property owners and occupiers are considered to be at a sufficient distance whereby effects are less than minor.

The application is for a discretionary activity the application has demonstrated that any adverse effects on the surrounding environment / owners and occupiers are less than minor. Under Section 95(e), no parties are considered to be adversely affected by the proposal.

4: Limited notification in special circumstances (s95B Step 4)

If special circumstances exist in relation to the application that warrant notification to any persons not already determined to be eligible for limited notification (excluding persons considered not affected under s95E) then the application must be notified to these persons.

It is considered that no special circumstances exist.

Notification conclusion

The application is for a discretionary activity the application has demonstrated that any adverse effects on the surrounding environment are less than minor. Under Section 95(e), no parties are considered to be adversely affected by the proposal.

The application does not trigger any of the steps requiring either public or limited notification and as such this application can be processed on a non-notified basis pursuant to section 95A-95B of the Resource Management Amendment Act 2009.

3.0 S104 ASSESSMENT

The relevant statutory provisions that were considered are the Resource Management Act 1991, the National Environment Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (NES), the Regional Policy Statement and the Wairarapa Combined District Plan.

## 3.1 National Environment Standards for Assessing and Managing Contaminants in Soil to Protect Human Health

The "National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS)" applies to the following activities where they are undertaken on land on which an activity or industry included on the "Hazardous Activities or Industries List" (HAIL) has been, is or is more likely than not to have been undertaken; • The removal of underground fuel storage system and associated soil

- Soil sampling
- Soil disturbance
- Subdivision of land
- Change in land use

The applicant sought a Preliminary Site Investigation (PSI) from EAM to clarify whether the site is 'a piece of land' subject to the NESCS. EAM carried out a detailed site history to review the historical land use at the site and carried out a site visit on 20th May 2023. Based the analysis, EAM conclude:

• Available aerial imagery suggests that the site has been farmland since at least 1941.

• The current owner has utilised the property for beef and dairy grazing since the 1980's. Prior to current ownership of the property, it was understood to be pastoral grazing.

• The herbicide MCPA has been used on the property to control weed growth of thistles, fat hen and other unwanted species. This herbicide is not considered to be persistent in soil environments.

• The property has been cultivated and re-grassed/cropped as required, and tillage of soils would assist in reduction of any residual sprays, and cadmium-based fertilisers within the soil environment. Based on the information gathered in this investigation, there are no potential contaminants of concern which have been identified within this site.

• The area of the site proposed for development has not been exposed to HAIL activities.

Overall, EAM considered it highly unlikely that there will be a risk to human health during and following the proposed solar farm activity from previous land use activities. To that end, the site is not a piece of land subject to the NESCS. The NES-CS is not applicable to this application.

## 3.2 Highly Productive Land

The consideration of the effects on highly productive land is a requirement to implement the National Policy Statement on Highly Productive Land (NPS HPL). Under the NPS-HPL, HPL is deemed to be land, which is LUC 1, 2 and 3. This is informed by the New Zealand Land Use Capability Survey Handbook and the Land Use Classification of the Wairarapa – Southern Hawkes Bay.

The proposed solar farm has been located and designed to largely avoid areas of land that have LUC 1, 2 and 3. Yet, following the paddock boundaries and topography, the extent of the solar farm includes 1ha of LUC3s2 (highly productive land).

The application is accompanied by a Production Capacity Assessment by AgFirst which concluded as follows:

• The existing farm grazes cattle as a support block for farms in the area and comprises an approximate area of 95ha.

• The area where the solar farm is being proposed takes up 7 paddocks in the middle of the farm, bordering the Waingawa River and close to the Masterton substation and existing distribution powerlines.

• The area contains no vital infrastructure that affects the operation of the farm on the balance of the farm and will utilise a large area of land that is not considered highly productive.

• The majority of the site being over LUC 6 land, and only 1ha being LU3.

• Currently the farm is leased out for cattle grazing and any land use change would require reasonable investment in shelter, irrigation, and infrastructure (all dependent on the land use). Furthermore, the farm would be limited by the soils and climate.

• The small area of highly productive land that will be utilised by the solar farm will also not compromise the use of the remaining HPL over the rest of the farm.

• The solar panels enable a dual land use opportunity, enabling sheep to be grazed in conjunction with the solar farm.

• The solar panels will cause some degree of temporary shading over the small area of HPL, which has been assumed to have some impact on the amount of solar radiation on pasture and thus a reduction in pasture production. This assumption is based on the limited research information available. However, the solar panels also increase moisture retention and provision of shade and shelter for sheep which helps to offset this reduction in pasture growth and could in fact result in no effect on animal production and/or have a positive impact on the LUC 6 land.

• The proposed use of part of the farm for solar, will not mean a permanent change to the productive capacity of the land. The solar farm is designed to be decommissioned and removed at the end of the project, estimated 40 years where the farmland will be returned to its previous state.

Overall, AgFirst considers that the proposed solar farm will have a less than minor effect on the district's availability of HPL for land based primary production, further the area can be reinstated to its current state once the solar farm is decommissioned.

# 3.3 National Policy Statement for Renewable Electricity Generation 2011

The National Policy Statement for Renewable Electricity Generation 2011 (NPS-REG) responds to the need to develop, operate, maintain and upgrade renewable electricity generation activities throughout New Zealand and that the benefits of renewable electricity generation being matters of national significance in New Zealand.

The NPS-REG is directly relevant to the assessment of this proposal for a solar farm which is a renewable energy generation facility.

# 3.4 Wellington Regional Policy Statement (RPS)

The Wellington Regional Policy Statement (RPS) became operative on the 24th of April 2013. The RPS is designed to achieve the purpose of the RMA by providing an overview of the resource management issues for the region, and stating the policies and methods required to achieve the integrated management of the region's natural and physical resources.

Energy is one of the themes set out in RPS and the objectives and policies are considered relevant to the assessment of this proposal.

# 3.5 Wairarapa Combined District Plan

## The Operative Wairarapa Combined District Plan became operative on 25 May 2011.

4.3.1 Objective Rur1 – Protection of Rural Character & Amenity

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.

## 4.3.2 Rur1 Policies

(b) Identify areas within the Rural Zone in which there are particular land use issues that require specific management approaches, including urban growth, flood hazards, and the operational requirements of key infrastructural facilities and intensive primary production activities – Rural (Special) Zone.

(c) 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, including an appropriate scale, density and level of environmental effects.

## 4.3.4 Objective Rur2 – Provision for Primary Production and Other

#### Activities

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.

## 4.3.5 Policies Rur2

(b) Provide for other land uses as permitted activities in the Rural (Primary Production) Zone and Rural (Special) Zone, subject to such environmental standards as necessary to avoid, remedy or mitigate any adverse effects.

(c) Ensure activities that are potentially sensitive to the adverse external effects of primary production and other activities, particularly those activities with significant external effects, are either appropriately sited, managed or restricted to avoid or mitigate these effects.

## 4.3.7 Objective Rur3 – Interzone Management

To ensure the amenity values of adjoining zones are reasonably protected from the adverse effects of activities within the Rural Zone.

#### 4.3.8 Rur3 Policy

(a) Manage the effects of Rural Zone activities to ensure that the environmental qualities and characteristics in the adjoining zones are not unreasonably degraded, bearing in mind their location adjacent to a functioning primary production environment.

#### 16.3.4 Objective NUE2 – Energy Generation and Efficiency

To move the Wairarapa towards a sustainable energy future by encouraging energy efficiency and the generation of energy from renewable sources.

#### NUE2 Policies

(b) Recognise the local, regional and national benefits to be derived from renewable energy generation.

(c) Recognise and manage appropriate development of the Wairarapa's significant potential renewable energy resource.

(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.

(e) Recognise and promote the use of environmental management codes of practice and best practice methods in energy generation, distribution and use.

(f) Recognise the technical and operational requirements of energy generation and distribution and its benefits to the wellbeing of the Wairarapa when setting and implementing appropriate environmental standards to avoid, remedy or mitigate the adverse effects on the environment and when assessing applications for resource consent. (g) Manage subdivision and land use activities to avoid adverse effects on the efficient operation of established energy generation facilities.

## 19.3.1 Objective GAV1 – General Amenity Values

To maintain and enhance those general amenity values which make the Wairarapa a pleasant place in which to live and work, or visit.

## 19.3.2 GAV1 Policies

(a) Recognise that temporary activities generally have a minor effect on amenity due to their short duration, provided that some limitations are imposed as necessary to avoid significant, albeit short-term, effects.

(b) Control the levels of noise, based on existing ambient noise and accepted standards for noise generation and receipt.

(d) Ensure vibrations occurring through the use of equipment or machinery does not cause adverse effects on the comfort of occupants of adjacent properties.

(f) 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.

(g) Manage the levels of odour and dust by avoiding inappropriate odours and dust from adversely affecting sensitive activities on adjoining properties.

## The Proposed Wairarapa Combined District Plan

General Rural Zone

GRUZ-O1 Purpose of the General Rural Zone

The General Rural Zone is used primarily for primary production, activities that support primary production, and other activities that have a functional need or operational need to be located within the General Rural Zone.

#### GRUZ-O2 Rural Character

The predominant character of the General Rural Zone are maintained and enhanced, which include:

a. areas of viticulture, crops, pasture, forestry (indigenous and plantation), and the presence of a large number of farmed animals;

b. sparsely developed landscape with open space between buildings that are predominantly used for agricultural, pastoral and horticultural activities (e.g. barns and sheds), low density rural living (e.g. farmhouses, seasonal worker accommodation, and a small degree of rural lifestyle), and community activities (e.g. rural halls, domains, and schools);

c. a range of noises, smells, light overspill, and traffic, often on a cyclic and seasonal basis, generated from the production, manufacture, processing and/or transportation of raw materials derived from primary production and ancillary activities;

d. interspersed existing rural industry facilities associated with the use of the land for intensive primary production, quarrying activities, and cleanfills; and

e. the presence of rural infrastructure, including rural roads, state highways, the National Grid and the on-site disposal of wastewater, and a general lack of urban infrastructure, such as street lighting, solid fences, and footpaths.

## GRUZ-P3 Rural Character

Provide for subdivision, use, and development where it does not compromise the purpose, character, and amenity of the General Rural Zone, by:

a. enabling and promoting openness and predominance of vegetation;

b. enabling and promoting a productive working landscape;

c. enabling primary production and ancillary activities;

d. providing for varying forms, scale, and separation of structures associated with primary production activities;

e. managing the density and location of residential development;

f. ensuring allotments can be self-serviced;

g. retaining a clear delineation and contrast between the Wairarapa's rural areas and urban areas; and

h. avoiding, remedying, or mitigating reverse sensitivity effects.

ENG – Energy

ENG-O1 Benefits of renewable electricity generation

The significant local, regional, and national benefits of renewable electricity generation are recognised and provided for.

ENG-O2 Adverse effects of renewable electricity generation

Renewable electricity generation activities are designed and located to minimise adverse effects on communities and the environment while recognising their operational or locational constraints.

ENG-P4 Large-scale renewable electricity generation activities

Provide for large-scale renewable electricity generation activities where effects are appropriately managed, by having regard to:

a. benefits of large-scale renewable electricity generation;

b. any locational, technical, or operational constraints;

c. transport and infrastructure capacity to accommodate the activity;

d. earthworks and construction effects;

e. the design and site layout of the activity and its ability to internalise effects;

f. potential adverse effects from the activity, including traffic generation, visual, light, safety, and noise;

g. whether there is adequate separation from sensitive activities to ensure adverse effects, including potential adverse reverse sensitivity effects, are minimised;

h. cumulative effects from multiple renewable electricity generation activities;

i. potential for adverse effects on natural features and landscapes, waterbodies, indigenous biodiversity, historic heritage, and sites of significance to Māori;

j. potential effects on the productive capacity of the land, including the ability to protect the productive capacity of highly productive land;

k. consideration of long-term management and responsibilities for the development; and l. any adaptive management measures proposed.

It is considered that the application is not contrary to the above objectives and policies. A full District Plan assessment is provided below. The activity itself is a Discretionary Activity. The applicant has provided significant documentation describing mitigating aspects of the operation.

# 3.6 District Plan Analysis

The proposal is for the construction, operation of a proposed solar farm at 51, 99 and 107 Cornwall Road, Masterton at approximately 25ha in area. The solar farm enables the generation of circa 12.5MW(AC) of renewable electricity which is equivalent to powering approximately 4,000 homes with the electricity generated supplying the National Grid.

The applicant has submitted an Assessment of Environmental Effects with associated documents including CF Projects Civil Assessment, Wayfinder Landscape and Visual Assessment, ECC: Transport Assessment Report, Marshall Day Acoustic Assessment, Forbes Ecology Ecological Values Assessment, AgFirst Production Capacity Assessment, Aurecon: Glint and Glare Assessment and EAM PSI Assessment.

## Landscape, Visual Amenity and Rural Character

The Wayfinder Landscape and Visual Assessment concluded that the landscape effects of the proposal will be low. The solar farm will be somewhat different within the rural character bordering the south and west of the site, however, the solar farm is considered to be a productive activity, utilising the rural environment within a highly modified productive rural environment. The site will not be dissimilar to the eclectic mix of activities found across the peri-urban environment to the north and east of the site.

Views of the site itself are relatively restricted. Existing mature shelter belts provide screening for the majority of the proposal leaving only fleeting glimpses of the site for the casual traveller along SH2 or Cornwall Road representing a small portion of a wider journey across the landscape.

For dwellings in the immediate and more distant locality, visual effects are considered to be low to very-low. Oblique views, existing screening by foreground elements and the visually dominant Tararua Ranges will likely result in the panels being a small portion (if seen at all) of the general outlook from these properties.

It is noted that the The Wayfinder Landscape and Visual Assessment was peer reviewed by Boffa Miskell Ltd who concluded that there would be no effects on the landscape and visual resource which would be greater than Low.

Overall, it is concluded that although the solar farm will result in a change in landscape character, it is a productive activity within a highly modified productive landscape. The landscape and visual effects are considered to be, at most, low which can be considered to be less than minor.

#### **Glint and Glare**

A Glint and Glare assessment was undertaken by Aurecon and submitted as part of the application. This included a geometric assessment for the surrounding roads and dwellings considering the angles of incident sunlight and reflected light from the solar farm. It concluded that for very low sun angles, the reflected light will appear to be coming from the same position as the sun, so glare effects are disregarded. The difference between the sun angle and glare reflection angle needs to be greater than approximately 10° for noticeable glare to be experienced. However, in this case the reflected light is significantly higher than any potential observers. Nil glare effects were predicted to occur at nearby dwellings and public roads.

The GlareGauge tool was used to estimate glare for the final two-mile approach flight paths (FP1 and FP2) at the nearby Hood Aerodrome. For FP1 (approaching from the northeast), some low-intensity glare is predicted to occur during two limited windows approximately 5 weeks each year, commencing in late-February and early-September each year. During each of these windows, glare is predicted for a duration of up to 4 minutes per day between the hours of 6pm to 7pm. For FP2 (approaching from the southwest), some low-to-medium intensity glare is predicted to occur during a limited period of approximately 14-weeks commencing in May each year, for a duration of up to 10 minutes per day between 7am and 8.15am. For both flight paths, the effects are expected to be less than minor and no mitigation is recommended due to the low intensity of glare,

short amount of time affected, and reduction of effective glare due to cloud cover and software limitations of the GlareGauge model causing it to generally over-predicting glare.

Overall, no noticeable glint effects are expected due to the slow movement of the PV modules, and no material glint or glare is expected to occur as a result of the solar farm with no mitigation is required. As such effects are less than minor.

#### **Noise Effects**

The Marshall Day acoustic assessment concludes that noise generated by the solar farm, in particular the power conversion units (PCU), can comply with the Rural Zone noise limits. Marshall Day considers the application of the nighttime noise limits is an appropriate method of understanding the noise effects because PCU's sometimes operate outside the daytime noise limits (0700-1900), i.e. late summer etc. Compliance with the night-time noise limit sets a reasonable level of noise for this environment. In addition, the site operates in an environment which has a variety of activities contributing to the ambient background noise, including rural industry, SH2, and the Waingawa Industrial Area, and the Masterton substation.

Further the acoustic assessment by Marshall Day demonstrates that compliance with NZS6803:1999 Construction Noise can be achieved during the construction activities at the site. The preparation of a draft Construction Management Plan will detail the construction methodology and demonstrate how compliance will be achieved and monitored.

Overall, the actual and potential adverse effects from noise generated from the solar farm and during construction are considered to be less than minor on the environment and at adjacent properties.

## Traffic Effects

A Transportation Assessment Report was undertaken by ECC, this assessed the proposed use of existing access from Cornwall Road once the solar farm is operational, it noted they were satisfied that the current design and surfacing will meet the requirements of the proposed traffic and usage from both the existing activities and the 10 vehicle movements per day (vpd) that would be generated by the solar farm.

As a precaution, a recommendation was that signage be installed to remind drivers exiting Cornwall Road to watch for vehicles entering the site. Given the above it is considered that the generation of traffic onto Cornwall Road and the wider road network is minimal and will not adversely affect the safety or efficiency of the road network.

The Transportation Report assessed the construction effects and concluded as follows:

• the construction traffic is estimated to be 112 vehicles per day (during peak workforce) with construction workers (two per vehicle) carpooling to / from the site and expected peak heavy vehicle volume of six (6) heavy vehicles entering and exiting the site per day.

• A morning peak arrival period and an evening peak departure period will be generated to and from SH2 via Cornwall Road.

• Cornwall Road is currently carrying a low volume of no more than 400 vpd which is well within the carrying capacity of a two-way two-lane rural road. The addition of 112 vpd is not expected to generate any operational or safety related issues.

• The SH2/Norfolk Road/Cornwall Road roundabout addresses existing safety issues at the intersection and provides more capacity, particularly for sideroad movements.

On this basis, the intersection is expected to have ample capacity to accommodate construction traffic movements generated by the site.

The construction traffic generated by the proposed activity is to be managed by way of a Construction Traffic Management Plan (CTMP) and avoid, remedy mitigate adverse effects on the movement of vehicles to and from Cornwall Road. It is noted that Councils Traffic engineer also supports the application subject to condition.

Given the above the actual and potential adverse effects from construction traffic and operational traffic can be managed and will be less than minor on the environment and on those at adjacent properties.

## Flooding / Natural Hazards

CF Project infrastructure assessment concluded that based on the available flood modelling and elevation data, that the proposed development can be undertaken with negligible impact on flood extents and neighbouring properties when completed in consideration with the following recommendations:

• Filling within overland flow paths shall not be undertaken;

• Important infrastructure (such as the PCUs) to be placed at locations where they will not be impacted by flood extents, if this cannot be achieved, they will be positioned on earth bunds providing 500mm freeboard above the modelled flood depths;

• A further 50 metre buffer from the river corridor is applied to the location of PCUs.

• A detailed design shall be completed detailing heights of all accessways, site compounds and PCU location, care should be taken when converting flood height datums to local co-ordinates. The detailed design should confirm that the location of infrastructure will not impact on the modelled 1% AEP flood event.

• Existing planting on the northwestern boundary is maintained to minimise flood debris entering site where it may collect on the solar mounting/tracking system foundations/piles.

• A detailed design shall be completed detailing heights of all accessways, site compounds and PCU locations, care should be taken when converting flood height datums to local co-ordinates. The detailed design should confirm that the location of infrastructure will not impact on the modelled 1% AEP flood event.

• A flood hazard management plan may be developed for the site, this may include such measures as monitoring of inclement weather, positioning of panels in optimal orientation during flooding to allow water to pass safely during flood events and maintenance of swales and/or overland flow paths.

It is noted that the applicant has proffered a flood hazard management plan as a condition of consent to capture and manage the recommendations of the CF projects report. As such the flood hazard risk, the effects of the proposed solar farm and the measures available to avoid and reduce effects of flooding on the site will not worsen for properties and people nearby, the use of the land within the flood hazard zone is considered appropriate with less than minor adverse effects on the environment and those at adjacent properties. Further no other Natural Hazards have been identified which will adversely impact this proposal or impact neighbours through the solar farms presence or construction.

# Earthworks

CF Project infrastructure assessment concluded that earthworks required for the solar farm are considered minor in the context of the size of the site, primarily consisting of topsoil removed for the construction of internal accessways. With excess volumes of topsoil generated to be retained onsite. Further the proposed development will not significantly increase runof with the primary stormwater management /attenuation method being grassed swales.

## **Ecological effects**

The application is supported by an Ecological Values assessment by Dr Adam Forbes. This concluded that there are no natural inland wetlands indicated by vegetation, soils, or hydrology on the site, and the former drainage channels are at best classed as ephemeral and do not meet the definition of 'river' in the RMA. There are no other ecological values on the site and no adverse effects to be considered.

## **Cultural and Heritage Effects**

There are no sites of cultural significance identified on the site as noted in the District Plan further there are no historic heritage or archaelogical site located on the application site or in the surronding close proximity. Overall, Cultural and Heriatage effects would not be more than minor.

Overall adverse effects from the proposal are considered to be less than minor and therefore acceptable.

#### 4.0 CONCLUSION

## 4.1 S104 Consideration/recommendation:

Having considered the application against the provisions set out under the above section, and specifically (i)-(iv) it is my assessment that there are no provisions within any national policy statement, national environment standard, or other regulation that are relevant to this application pursuant to Section 104A of the RMA and after having considered the application pursuant to section 104, including any actual and potential effects on the environment of allowing the activity, and the relevant provisions of the Regional Policy Statement and District Plan, the proposed activity can be granted resource consent.

#### 4.2. S106 Consideration and recommendation

Consideration has been given to the matters set out under this section of the Act and nothing has been identified which would result in Council refusing this application or granting it subject to conditions in accordance with this section of the Act; therefore, this consent can be granted.

Reported and recommended by:

Delegated Officer authorised for final approval by:

Solitaire Robertson Manager, Planning and Regulatory

Nick Eagle Planning Consultant

**DATED** at Carterton this 1<sup>st</sup> day of August 2024

For and on behalf of the CARTERTON DISTRICT COUNCIL

Consent: 240014

## Appendix C Document 1

# Serah Pettigrew

_		
From:	Russell Hooper <russellhooperconsulting@gmail.com></russellhooperconsulting@gmail.com>	
Sent:	Monday, 5 June 2023 9:50 pm	
То:	Solitaire Robertson	
Subject:	Small Solar Farm Norfolk Road	
Attachments:	ents: Solar Farm Permitted Activity_compressed.pdf; 220103-Application- final-10012023.pdf; 220103-s95-Decision-FINAL.pdf	

**Caution:** This email originated from outside the council. Do not click links or open attachments unless you recognize the sender and know the content is safe.

#### Hi Solitaire,

As discussed last week, I have assessed this proposal against the rules and standards of the District Plan and have come to the conclusion that it is a permitted activity.

The proposal is listed as a permitted activity "construction of an energy generation facility" (21.1.24) in the District Wide Chapter and meets all applicable District Wide standards.

The proposal meets all Rural Zone permitted standards and is not captured as a restricted discretionary activity, discretionary activity, or non-complying activity in the Rural Zone chapter.

The proposal is set out briefly and assessed against the District Plan in the attached document.

Could you please have an initial look at this to see if you agree with where I have landed in terms of permitted activity status. If you do we will apply for a certificate of compliance rather than a resource consent.

In summary;

6.5ha solar farm proposed, made up of solar panels, an inverter station, and transformer at the Norfolk Road transmission lines.

Under District Wide Rule 21.1.24 the <u>construction</u>, maintenance and upgrading of network utilities and energy generation facilities are permitted where they meet the permitted standards in the rule. The bulk of the permitted standards relate to network utilities and <u>existing</u> energy generation facilities. However, Rules 21.1.24(a)(ii) Antennas and 21.1.24(a)(iv) Radiofrequency Exposure could relate to the construction of an energy generation facility and therefore the proposal is permitted under 21.1.24 if these standards are met.

Rural Zone Rule 4.5.5(c)(a) relates to building gross floor area. Solar panels are defined as buildings but do not have a gross floor area. Therefore solar panels over  $25m^2$  in panel area are not captured by 4.5.5(c)(a). The inverter station is containerised and within a 20 foot container with a gross floor area of just under  $14m^2$ .

## Looking at the Greytown application;

The applicants assessed the activity status as a restricted discretionary activity (see application attached);

- Buildings (solar panels) not required for primary production or residential use over 25m<sup>2</sup> and triggering resource consent under Rule 4.5.5(c).
- Buildings (solar panels) within rural setbacks.

Robert Scofield in the s95 decision assessed the activity as a discretionary activity overall (see decision attached);

• An activity which does not comply with the standards for permitted activities or is otherwise not specified as a controlled, or restricted discretionary activity under Rule 21.6(a). Rule 21.1.24 relates to the construction,

maintenance and upgrading of network utilities and energy generation facilities, where these activities are permitted where they meet the stated permitted standards. In Robert's opinion there are no permitted standards applicable to the construction of an energy generation facility and for that reason the construction of an energy generation facility is not a permitted activity.

• A building (staff office and data room) not required for primary production or residential use over 25m<sup>2</sup> and triggering resource consent under Rule 4.5.5(c) - RDA.

Points on the Greytown assessment;

- There are permitted standards in 21.1.24 which are relevant to the construction of energy generation facility.
- If the intention was that the construction of an energy generation facility was not permitted by 21.1.24 the word construction would not be in the rule title. It is too convoluted a pathway for an activity to be stated as being permitted subject to meeting the following standards which do not exist.
- Robert has not identified the actual solar panels triggering consent under 4.5.5(c) just the 30m<sup>2</sup> staff and data building.

Look forward to hearing from you. Please let me know if you have any questions or need any additional info.

Regards,

Russell Hooper Environmental Planner 0275 660 967

russellhooperconsulting@gmail.com www.russellhooperconsulting.com



Russell Hooper Consulting

# Proposed Community-Scale Solar Farm – 331 Norfolk Road, Carterton

Site –

- 331 Norfolk Road, Carterton
- 12ha property with residential use at the front and paddocks at the rear.
- Water Race runs through the centre of the site.
- Mix of LUC class 4 and 6 (summer dry) so NPS-HPL not relevant.



Figure 1 - Site and surrounding sites



Figure 2 - Extent of solar panels within site

## Proposal -

- Carterton has very high levels of solar potential
- Powerco approval has been obtained, so the proposal can proceed
- The site is located where energy generated will supply the JNL and other users in the Waingawa Industrial area
- 6.5ha of the site to be used for solar panels (approx 10,300 panel modules)
- Central inverter and transformer station to convert direct current electricity generated by the panels to alternating current which is the form used in homes and businesses
- Transformer at Norfolk Road electricity lines
- Panels tilt to follow the sun
- Each panel is approximately 2.4m in length and 1.3m in width
- Each panel will be approx 2.5m above ground when fully tilted
- Panels will be high enough off the ground to allow sheep to graze underneath
- Screening vegetation will be planted where required, landscaping details to be confirmed



Figure 3 - Solar panels being constructed

## District Plan analysis

Energy generation facilities are referred to in District Wide Rule 21.1.24. Neither the District Plan nor the Resource Management Act defines an energy generation facility. In the context of the District Plan this proposal is for a (solar) energy generation facility.

"Network Utility" is defined in the District Plan, as "any utility which is part a network and includes electrical lines, water, sewage and stormwater reticulation, streetlighting, telecommunication facilities, radiocommunications facilities, gas, roads, railway lines, airports,

lighthouses, navigation aids and beacons, meteorological services and associated support structures".

Based on this definition an energy generation facility could fit in to the definition of "network utility" as it is not clear at what point a network begins. However, 21.1.24(a), the District Plan refers to "construction, maintenance and upgrading of network utilities **and** energy generation facilities" (emphasis added). This separates network utilities from energy generation facilities and helps to define the two. If energy generation facilities were captured in the definition of network utilities, 21.1.24(a) would not have referred to them separately.

Therefore, an energy generation facility is the activity and equipment required to create the energy to be distributed by the network utility. The point at which the energy generation facility stops and the network utility starts is the point where the electricity enters the network utility. In this context this is the connection to the electricity lines in Norfolk Road.

Accordingly, for the purpose of assessing the District Plan rules and standards, this proposal is for the construction of an "energy generation facility" and not a "network utility".

District Wide	Chapter	Compliance
Permitted Ac	tivities	
21.1.1	Notable Trees and Street Trees	N/A
	No notable trees or street trees on site	
21.1.2	Sites of Historic Heritage Value	N/A
	No heritage items on site	
21.1.3	Historic Heritage Precincts	N/A
	Site is not within a heritage precinct	
21.1.4	Outstanding Landscapes	N/A
	Sis not within an outstanding landscape	
21.1.5	Significant Natural Areas	N/A
	No significant natural areas on site	
21.1.6	Indigenous Vegetation and Habitats	N/A
	No indigenous vegetation and habitats	
21.1.7	Wetland Restoration and Enhancement	N/A
	No wetlands on site	
21.1.8	Reserves	N/A
	No reserves on site	
21.1.9	Significant Waterbodies	N/A
	No significant waterbodies on or adjacent to site	
21.1.10	Activities on the Surface of Freshwater	N/A
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	No activities on the surface of freshwater proposed	
21.1.11	Outdoor Artificial Light	Will comply
	(a) The emission of outdoor artificial light (including glare) meets the following standard:	
	(i) A maximum artificial light level of 8 lux (lumens per square metre) measured at 1.5m above ground level at the site boundary.	
	(ii) Within the Dark Sky Management Area identified within Appendix 16, all outdoor lighting shall have a colour temperature of light emitted of 3000K Kelvin or lower.	
	(iii) Within the Dark Sky Management Area identified within Appendix 16, all outdoor lighting with a light output of 500 lamp lumens or greater shall be shielded or tilted so as to not emit any light at or above a horizontal plane measured at the light source.	
	The Carterton District is within the Dark Sky Management Area. All lighting at the site will comply with the above permitted standards.	
21.1.12	Dust and Odour	Will comply
	Dust from establishment of the solar farm will be controlled and there will be no odour	
21.1.13	Noise	Will comply
	The inverter station will make a slight hum, similar to an electricity	
	transformer. The inverter station will be located within the centre of the site and any noise from the inverter station will be well within the rural	
	noise limits. The transformer at Norfolk Road will also meet the rural	
	noise standards.	
21.1.14	Derelict Vehicles	N/A
21.1.15	Access to Premises	N/A
21.1.16	Temporary Activities	Will comply
	(a) Activities ancillary to or incidental to building and construction shall be:	
	(i) Limited either to the duration of the project or for a period not exceeding 12 months, whichever is the lesser;	
	(ii) Within construction noise limits set out in 21.1.13	
	The solar farm will be constructed within 12 months and comply with the	
	to establishing a vineyard.	
21.1.17	Coastal Environment Management Area	N/A
21.1.18	Foreshore Protection Area	N/A
	Faultline Hazard Area	N/A
21.1.19		

21.1.21 <b>So</b>	Conservation and l	River Control Works	N/A
21.1.22 Ha	ardous Substances	and Facilities	N/A
Th	re are no HSNO mate	erials involved in the solar farm.	
21.1.23 Ac	ivities within Conta	minated Land	N/A
21.1.24 <b>Ne</b>	work Utilities and E	nergy Generation Facilities	
	(a) The construction and energy go standards:	n, maintenance and upgrading of network utilities eneration facilities which meets the following	
	(i) Maxin	num Height and Setbacks	
	All ab structu antenu with tl bound Enviro	nove ground network utility and meteorological ures, except lines, poles, towers, masts, aerials, nas and their brackets or attachments, must comply he maximum height standards, maximum height to dary, and minimum building setback, for the nomental Zone in which they are located, except	network utilities
	(ii) Anten	nas	Complies
	Rural,	Commercial and Industrial Zones:	
	(3)	No dish antenna shall exceed 5m in diameter;	
	(4)	No panel antenna shall exceed 2.5m in any dimension.	
	No antennas in	excess of the above proposed.	
	(iii) Building		
	(1)	No building located above ground for network utility purposes shall exceed 10m2 in gross floor area.	N/A. Applies to network utilities
	(2)	Buildings used for network utilities purposes may encroach the minimum building setbacks in the respective Environmental Zone in which it is located, subject to compliance with the following:	
	(iv) Radiofreque	ncy Exposure	
	(1)	The maximum exposure levels shall not exceed the levels specified in NZS 2772:1999 "Radiofrequency fields - Maximum exposure levels - 3 kHz to 300 GHz";	Will comply
	(2)	Maximum exposure levels shall be 3kHz to 300GHz in areas normally accessible to the public.	
	(v) High Voltage	Electricity Transmission Lines	N/A
	(1)	Lines for conveying electricity shall have a voltage up to and including 110kV;	
	(2)	Sethack 20 metres from dwellings	

	(vi) Water Supplies		Not a standard
	(vii) Wastewater and Stormwater		Not a standard
	(1) Underground networks for water or sew equipment.	pumping stations and pipe the conveyance or drainage of vage, and necessary incidental	
	(viii) Traffic Management	ţ	
	(1) Traffic manag street lighting,	gement and control structures, and street furniture.	Not a standard
	(ix) Existing Network Utilities		N/A
	(x) Existing Energy Generation Faci	ilities	N/A
	(xi) Undergrounding of Lines and F	Pipes	N/A
	(1) All new lines, co Commercial o constructed un	ables and pipes in the Residential, and Industrial Zones shall be nderground.	
	(2) No new poles s Commercial a replacing exist.	shall be erected in the Residential, nd Industrial Zones, other than ing poles.	
	(xii) Reinstatement		Ν/Δ
	(1) That continue established ov disturbed for maintenance o	ous vegetative cover shall be ver any natural ground surface the construction, upgrade, or repair of any network utility.	Applies to network utilities
	(xiii) Noise Limits	<b>Y</b>	
	(1) Sound levels fr reserve shall co adjoining zone any façade of purposes. A fa shall apply in provisions of Environmental	rom network utilities within road omply with the noise limits for the e at any point within 1.5 metres of f a building used for residential açade correction of minus 3 dB n addition to the assessment NZS 6802:1991 "Assessment of Sound	N/A. Applies to network utilities
21.1.25	Roads, Access, Parking & Loading		Will comply
	Access will be from the existing entrance a standards	and constructed to District Plan	
21.1.26	Water Supply, Wastewater and Stormw	vater	Will comply
21.1.27	Financial Contributions		N/A
21.1.28	Aerodrome Protection		N/A



21.2.1	Network Utilities	N/A
		Proposal is not for a network utility
21.2.2 F 22.2.4 N	lazardous Facilities, 21.2.3 Wetland Restoration and Enhancement, and leteorological Structures (respectively)	N/A
Restrict	ed Discretionary activities	
21.4.1	Work undertaken on a Notable Tree or Street Tree	N/A
21.4.2	Indigenous Vegetation	
21.4.3	Structures in the Coastal Environment Management Area	
21.4.4	Earthworks in the Coastal Environment Management Area	
21.4.5	Significant Waterbodies	
21.4.6	Motorised commercial recreation on the surface of freshwater	
21.4.7	Flood Hazard Area and Erosion Hazard Area	
21.4.8	Network Utility Structures within Road Reserve	
21.4.9	Buildings within 20m of a High Voltage Transmission Line	
21.4.10	Activities within Contaminated Land	
21.4.11	Noise Sensitive Activities within Outer Air Noise Boundary	
21.4.12	Goat Farming	
21.4.13	Financial Contributions	
21.4.14	Roads, Access, Parking and Loading Areas	
21.4.15	Meteorological Structures	
21.4.16	Helicopter Landing Areas	
21.4.17	Water Supply, Wastewater and Stormwater	
Discreti	onary Activity	1
21.6(a)	Any activity that does not comply with the standards for permitted	N/A
	activities or is otherwise not specified as a controlled, or restricted discretionary activity.	Complies with al
		standards
21.6(b)	Any earthworks or structures not complying with the permitted activity	N/A
	standards in any outstanding landscape listed in Appendix 1.1	
	Outstanding Landscapes.	
21.6(c)	Any modification, alteration, disturbance or destruction of any outstanding natural feature listed in Appendix 1.2 Outstanding Natural Features.	
21.6(d)	Modification or damage to, or destruction of, or within, any Significant Natural Areas listed in Appendix 1.3.	
21.6(e)	Any modification, alteration, disturbance or destruction of any archaeological site, geological site, waahi tapu, or area of significance	

to tangata whenua listed in Appendix 1.5 Archaeological and Geological Sites and Appendix 1.6 Sites of Significance to Tangata Whenua.

- 21.6(f) Any alteration, addition, relocation, reconstruction, partial demolition or total demolition not complying with the permitted activity standards for any heritage item listed in Appendix 1.7 Heritage Items, except for relocation and demolition of a Category 1 item under Rule 21.7(a).
- 21.6(g) The following activities within the Historic Heritage Precincts ...
- 21.6(h) Any repairs and maintenance in any Historic Heritage Precinct listed in Appendix 1.8 and located in the Masterton District.
- 21.6(i) Boarding kennels and catteries.
- 21.6(j) Wind energy facilities.
- 21.6(k) Any activity within the Greytown Future Development Area that is not consistent with the Structure Plan for this area.
- 21.6(I) Any activity involving the disturbance, removal, damage or destruction ("modification") of a wetland, except for planting restoration and enhancement work provided for in Rules 21.1.7 and 21.2.3.
- 21.6(m) Development Concept Plan in a Future Development Area.
- 21.6(n) Any hazardous facility where the total quantity of hazardous substances of any hazard classification on the site is in the range of the quantities for the relevant zone specified as a Discretionary Activity in the Hazardous Facilities Consent Status Table (Appendix 2), and the activity complies with the permitted activity performance standards in Rule 21.1.22 above.
- 21.6(o) Any activity within a Future Development Area for which there is no approved Development Concept Plan and which is not otherwise a permitted activity in the Rural Zone.
- 21.6(p) Any helicopter landing area that does not comply with the standards for a restricted discretionary activity in Rule 21.5(a)(i).
- 21.6(q) Earthworks within the Foreshore Protection Area (except as provided for in Rule 21.1.18(a)(iv)).
- 21.6(r) The erection, placement, or conversion of a building for habitable use within the Flood Hazard Area or Erosion Hazard Area.

Assessment of District Wide Rules

- Rule 21.1.24 states that the construction of an Energy Generation Facility which meets the permitted activity standards in 21.1.24 is a permitted activity. Few of the permitted standards are applicable to energy generation facilities. However, 21.1.24(a)(ii) Antennas, and (iv) Radio frequency Exposure can be applied to the activity. These standards are met and therefore the proposal is a permitted activity under 21.1.24.
  - All other applicable District Wide rules/standards are met.
  - Construction of an energy generation facility is not captured as a controlled, restricted discretionary, discretionary, or non-complying activity.
  - Assessment then proceeds to the Rural zone provisions.

	hapter	Compliance
4.5.2 Permit	ted Activities	
4.5.2(a)	Maximum building height	Complies
	(ii) Other buildings: 15 metres	
	Solar panels are 2.5m in height	
	Inverter plant is 2.6m high	
4.5.2(b)	Maximum Height to Boundary	Complies
	(i) 3 metres height at the boundary with a 45° recession plane.	
4.5.2(c)	Minimum Building Setback (excluding dwellings)	Complies
	(iii) 5 metres from all other boundaries.	
	(v) 5 metres from any other waterbody.	
	Solar panels are 7m from the boundary and 7m from the water race	
4.5.2(f)	Noise Limits	Will comply
4.5.2(h)	Signs	Will comply
4.5.2(i)	Roads, Access, Parking and Loading Areas	Will comply
	Access will be from the existing entrance and constructed to District Plan standards	
4.5.3 Contro	olled Activities	
None applic	able	
4.5.5 Restrie	ted Discretionary Activities	
(a)	Any bird-scaring device that is not operated in accordance with the standards for permitted activities (4.5.2(f) Exception (i)).	N/A
	No bird scaring device proposed.	
(b)	Any frost protection device that is not operated in accordance with the standards for permitted activities (4.5.2(f) Exception (ii)).	N/A
	No frost protection device proposed.	
(c)	Any activity that is not required for primary production and residential purposes that requires either:	Will comply
	(a) the construction or use of a building over 25m <sup>2</sup> in gross floor area; or	
	(b) the external storage of goods, products or vehicles (including	
	contractors yards);	
	(b) the external storage of goods, products of venicles (including contractors yards); and is not otherwise listed as a controlled, restricted discretionary, discretionary or non-complying activity.	
	<ul> <li>contractors yards);</li> <li>and is not otherwise listed as a controlled, restricted discretionary, discretionary or non-complying activity.</li> <li>Solar electricity generation is not required for primary production or residential purposes.</li> </ul>	

	The length of the panel rows will be up to 90m long and the width is 2.4m.	
	The District Plan defines gross floor area as – the sum of the total area of all the floors of all buildings on an allotment, excluding uncovered stairways, car parks and external balconies, measured in square metres.	
	Therefore, despite the solar panels being defined as buildings and being over 25m <sup>2</sup> they have no floor.	
	The inverter station is containerised within a 20 ft container with internal dimensions of 5.9m x $2.35m = 13.865m^2$ .	
	Following this, the proposal does not create the gross floor area over 25m <sup>2</sup> required to trigger Rule 4.5.5(c)(a).	$\mathcal{O}$
	With regard to Rule 4.5.5(c)(b), storage is not defined in the District Plan.	
	The Collins English dictionary defines the word storage as;	
	<i>"If you refer to the storage of something, you mean that it is kept in a special place until it is needed".</i>	
	The proposal involves the establishment of solar panels, inverter station, underground cabling, and a transformer to connect to the lines in Norfolk Road. These are all used in situ and there is no storage of any good, product, or vehicles.	
	Accordingly, the proposal does not trigger resource consent under 4.5.5(c).	
(d)	Any motorised outdoor recreation activity	N/A
(e)	Any activity that does not meet one or more of the standards for permitted or controlled activities.	N/A
	The above assessment shows compliance with permitted activities. The proposal is not a controlled activity and therefore the controlled activity standards are not applicable.	
4.5.6 Discre	etionary Activities	
(a)	<b>Any activity listed in the Schedule of Primary Industry (Appendix 4).</b> Neither a solar farm nor energy generation facility is listed in Appendix 4. Solar generation is not an activity which may become noxious or dangerous in relation to adjacent areas.	N/A
(b)	Any industrial activity.	N/A
	In the District Plan industry means	
	premises used for manufacturing, fabricating or processing, substances or material into new products, and includes the servicing and repair of goods,	
	storage of all materials, products and machinery; with	
	<ul> <li>ventices and machinery whether by machine of mana, and the parking of storage of all materials, products and machinery; with</li> <li>Primary Industry meaning industry listed in Appendix 4 Schedule of Primary Industries (Potentially Offensive, Noxious or Hazardous Industries); and</li> </ul>	
	<ul> <li>vernices and machinery whether by machine of mana, and the parking of storage of all materials, products and machinery; with</li> <li>Primary Industry meaning industry listed in Appendix 4 Schedule of Primary Industries (Potentially Offensive, Noxious or Hazardous Industries); and</li> <li>Secondary Industry meaning any other industry.</li> </ul>	

	electricity does not meet the District Plan definition of industry. In addition, given that energy generation facilities are specifically identified in the District Plan (ie, energy generation facilities have a permitted activity pathway at Rule 21.1.24 and wind energy facilities are specified as a discretionary activity at Rule 21.6(j)) they are not an industrial activity in the context of the District Plan. Just as converting grass into finished lambs is primary production (defined separately) rather than an industrial activity.	
(c)	Any retail activity with a gross floor area from 200m2 up to 2,000m².	N/A
4.5.7 Non-C	omplying Activities	
(a)	Any new noise sensitive activity located within the Inner Air Noise Boundary (65 dBA) as shown on the Planning Maps for the operation of the helicopter landing activity at 145 Chester Road, Carterton, legally described as Lot 1 DP 88190. (b)	N/A
(b)	Any retail activity with a gross floor area, 2,000m2 and over.)	N/A
Assessment - The - Ne a g	of Rural Zone Rules e proposal meets all rural zone permitted standards. ither the solar panel rows, the inverter station, or the transformer at Norfolk Re ross <u>floor area</u> over 25m <sup>2</sup> .	oad are buildings with

- A solar farm is not an industrial activity.
- The proposal meets all permitted standards in the rural zone and is not captured as a controlled, restricted discretionary, discretionary, or non-complying activity.

The proposal meets all Rural Zone permitted standards and is not captured as a controlled activity, restricted discretionary activity, discretionary activity, or non-complying activity.

## **Overall activity status**

The proposed solar farm is for the construction of an energy generation facility, which is a permitted activity under Rule 4.5.1(a) as an activity listed as a District Wide Permitted Activity in Section 21.1 and which complies with the relevant standards in those rules (21.1.24) and Section 4.5.2 and which is not otherwise specified as a controlled, restricted discretionary, discretionary, or non-complying activity under Sections 4.5 or 21.

Therefore, the proposal is a permitted activity and a certificate of compliance can issue.