Boffa Miskell

Buckleys Solar Array

Application for Resource Consent and Assessment of Environmental Effects

Prepared for KeaX Limited

9 August 2023

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1.0 Introduction

KeaX Limited ("**KeaX**") proposes to construct a new solar array (or solar farm) on approximately 111ha in the Brookside area, approximately 10km north of Leeston in mid-Canterbury. The solar array will be comprised of approximately 140,000 tracking solar panels, with the solar panels situated between 500mm and 3m above ground level. Once operational the solar array will be capable of generating up to approximately 50MW AC / 75MW DC of renewable electricity, to be fed back into the electricity network via the Brookside Substation located in the north-western corner of the site.

Resource consent is required under the operative Selwyn District Plan as a discretionary activity, as the solar array will generate electricity that will not be used on-site, seeks the retention of relocatable buildings on the site beyond the construction phase of the project (i.e. on a long-term basis to be used as a staff room and storage), and due to the scale of earthworks proposed.

Resource consent has been obtained from Environment Canterbury for earthworks that will intersect the highest groundwater level ever recorded on the Site and the discharge of stormwater from a utility onto land less than 1m above the highest groundwater level ever recorded on the Site.

This application for resource consent is made pursuant to Section 88 of the Resource Management Act 1991 ("RMA") and has been prepared in accordance with the Fourth Schedule of the RMA (reprint as at 19 April 2017) in such detail to satisfy the purpose for which it is required.

2.0 Applicant and Property Details

A completed application form is enclosed as **Appendix 1**. The summary details relating to the applicant and subject site are as follows:

To:	Selwyn District Council and Canterbury Regional Council
Applicant's Name:	KeaX Limited
Address for Service:	Boffa Miskell Ltd PO Box 110, Christchurch 8140 Attn: Claire Kelly Phone: 03 364 4209 Email: clairek@boffamiskell.co.nz
Address for Fees:	Campbell McMath KeaX Limited PO Box 38, Leeston 8632, Canterbury Attn: Campbell McMath Phone: 03 390 0009; 021 151 0583 Email: campbell@keaenergy.co.nz
Site Address:	150 Buckleys Road and 115 Buckleys Road, Brookside, Selwyn
Legal Description:	(refer Certificates of Title, in **Appendix 3**)
Owner/Occupier Name and Address:	Ward family of Pitcairn Farm Limited
Selwyn District Plan Zoning:	Outer Plains
Selwyn District Plan Overlays:	Wāhi Taonga Management Site – C59 (Ovens/Midden)
Proposed District Plan Zoning:	General Rural Zone
Proposed District Plan Overlays:	EIB Mudfish Habitat Overlay Plains Flood Management Overlay Liquefaction Damage Unlikely Overlay EIB Management Overlay; EIB Canterbury Plains Area Rural density – East Plains/ Te Waihora ki Waimakariri Code: SCA-RD2
Canterbury Land and Water Regional Plan Overlays:	Phosphorus Sediment Risk Area Semi-confined or unconfined aquifer system Surface water catchments: Boggy Creek Hanmer Drain Road

3.0 Description of Site and Surrounding Area

The solar farm is proposed to be constructed on approximately 111ha, which is comprised of several parcels of land as described below:

- 115 Buckleys Road 150 Buckleys Road, Leeston Lot 1 DP 7545, RS8955 and Lot 2 DP387576 owned by Pitcairn Farm Limited.
- 187 Buckleys Road, Leeston LOT 2 DP 54392 BLK IX LEESTON SD owned by Pitcairn Trustees Limited and Angela Marie Ward.

For the purposes of this assessment, these are hereafter collectively referred to as '**the Site**' and the address, for ease of reference, is described collectively as: 150 Buckleys Road, Brookside (see **Figure 1** below) and a location plan in **Appendix 2**.

Figure 1 Aerial image above showing the location and extent of the Site with the Wāhi Taonga Management Site – C59 (yellow).

Currently, the Site is used for dairy farming, and is characterised by irrigation infrastructure, existing dwellings at 187 and 115 Buckleys Road, farm buildings, and shelter belts. The shelter belt plantings surrounding the Site are well established, mature plants in areas along the road boundaries. In some locations there are gaps in the extent of tree planting, either where there are smaller shelter belt plantings, very young plantings, or no shelter belt plantings at all. In these areas partial and full views of the Site are possible.

The vegetation within the Site generally consists of pasture grasses, with a combination of exotic species including eucalyptus, pine trees, and native trees, used for the shelter belts and road boundary plantings.

Within the site, identified on the Operative Selwyn District Plan planning map, is the Wāhi Taonga Management Site – C59. This is located centrally on the site and shown in yellow in **Figure 1** above.

The wider area surrounding the Site is also used for dairy farming and other agricultural activities, with some semi-rural lifestyle blocks. A substation (designated: Brookside Substation) owned by Orion New Zealand Limited (Orion) is located at the junction of Buckleys Road and Branch Drain Road, adjacent to the north-western corner of the Site.The noise environment is generally relatively quiet, with higher levels of sound associated with machinery and other rural activities on a transient basis. The main contributors to the ambient noise environment (when wind speeds are low) are insects and birds, livestock, intermittent traffic on nearby roads and irrigator systems. Distant farm machinery is also audible at some locations. At higher windspeeds, wind generated noise in shelterbelts and other vegetation becomes more apparent. Some low-level electrical noise can be observed close to the substation at the northwest extent of the Site.

Acoustic Engineering Services (AES) deployed noise monitoring equipment at two separate locations on the Site on the afternoon of the 25th of January 2023. The monitoring data was reviewed for days and periods when the wind speeds were relatively low during the proposed operational hours of the solar farm. This confirmed that in these conditions there are extended periods where noise levels are between 38 – 48 dB LAeq (15 min), often with several louder periods throughout the day.

4.0 Proposal

KeaX proposes to construct an approximately 111 ha solar array on the Site which will have a generating capacity of 100GWh (50MW AC / 75MW DC) on completion. The Site is ideally located adjacent to an existing substation that will facilitate connections into the local lines network, and will, on completion, be able to power approximately 11,200 houses.

The solar array will comprise a total of 140,000 tracking panels set within tables with thirteen inverters, the layout of the Site is shown in **Appendix 4**. Each table comprises 26 pairs of modules (i.e. 52 panels per table - 26 on top row and 26 on bottom row of the table). An image showing what the panels will look like is provided in the solar panel plans in **Appendix 5.**

The panels will be approximately 1.30m wide and approximately 2.38m long. When flat/horizontal (in stow position) they will be 1.6-1.8m above the ground and will be 500mm above the ground and no more than 3.0m above the ground (during maximum tilt). They will be on piles that are driven into the ground approximately 1.8m deep and the piles are approximately 6.5m apart. It is proposed that the rows will be approximately 4.0m apart (when the panels are flat).

The reflectivity value of the panels will be below 4%.

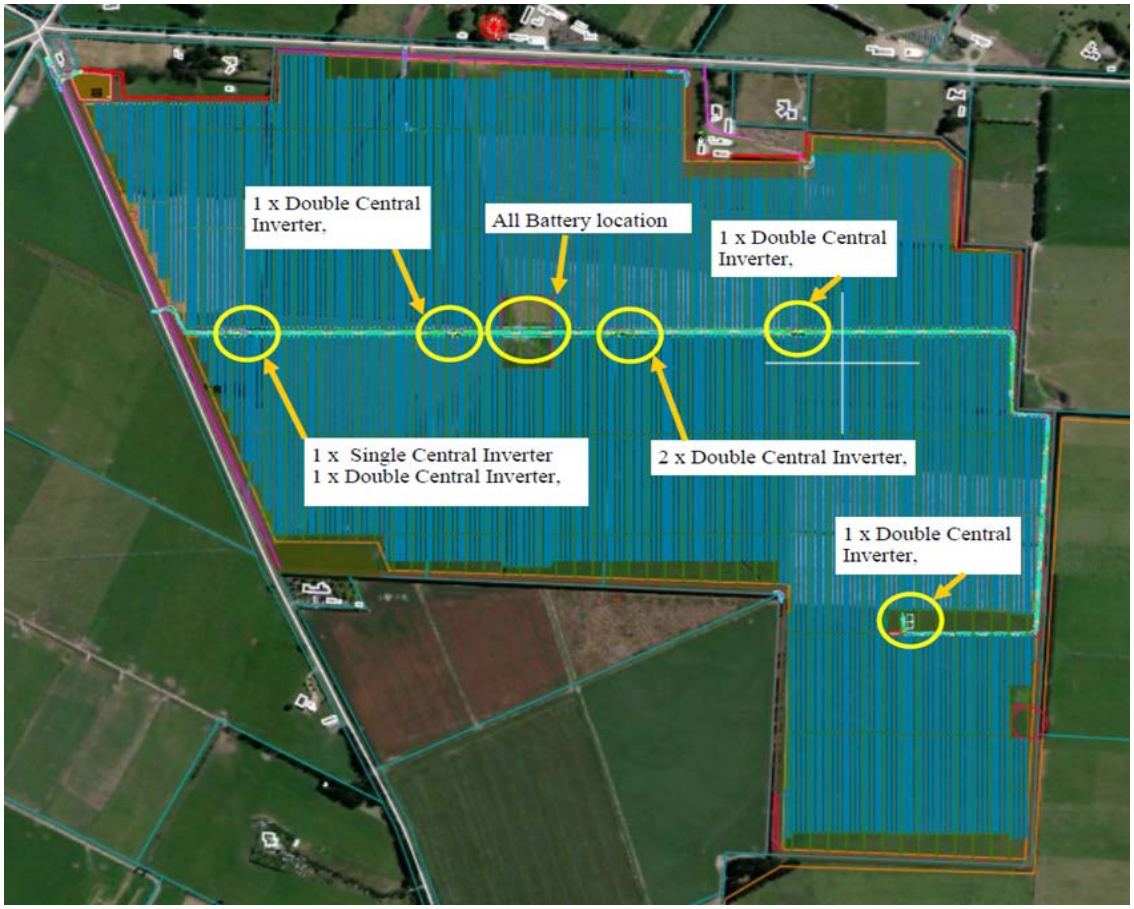

Figure 2: Site Layout and Battery Plan.

It is proposed to ensure that there is sufficient space between the tables to accommodate internal roading within the Site to allow access for construction and maintenance. Sheep grazing or other primary production will occur underneath the panels to manage the growth of grass across the Site.

The solar array will require thirteen inverters, as the number of inverters required is commensurate to the megawatt output of the solar panels. The thirteen inverters (shown in the images and plans in **Appendix 6 and 7**) will form a crucial piece of infrastructure for the solar array as they will convert the direct current generated by the solar panels into alternating current electricity which will then be fed into the electricity grid. The inverters will also manage the amount of electricity exporting into the grid to ensure the system remains stable. The proposal will include a combination of single skid and twin skid inverters, which can handle different electricity generation. The single skid inverter can handle 4.39 MW, whilst the twin skid inverter (2 Inverters together) is designed to handle 8.78 MW.

Whilst not proposed to be installed as a part of the initial site works, KeaX may install batteries on the Site in the future. The batteries may be required in the later stages of development, or on completion of the solar array, by Transpower and Orion to actively manage rapid drops in power and fluctuations, which can be caused by cloud cover. In the longer term, 4 – 5 years, it may also be economical to store and sell excess energy during periods of high demand to support the overall electricity grid. The batteries will be housed in containers within the Site and are located as shown on the plans in **Appendix 4** and above in Figure 2.

4.1 Site preparation works

To prepare the Site for the installation of the panels, all existing internal fencing and structures such as irrigators will be removed, as well as shelter belt plantings that are internal to the Site. Trees that will be removed will be utilised for firewood by the landowners. All existing road boundary plantings and shelterbelts will remain on site.

It is proposed to retain some of the water infrastructure, including existing water tanks, to provide water for livestock grazing on the Site, and reduced irrigation.

As a part of the initial site preparation works that part of the Wāhi Taonga Management Site – C59 within the Site will be fenced off, with a 50m buffer surrounding the Area.

4.2 Construction-phase works

The Site will be accessed from an existing access from Branch Drain Road, approximately halfway between the northwest corner of the Site (near the substation) and 324 Branch Drain Road, the southwest corner of the Site. The vehicle crossing will be upgraded prior to commencing construction on the Site.

It is proposed to construct the solar array in its entirely and not stage the works, so up to a hundred staff will be on site during the peak construction period. A site office is proposed to support both construction and operations on site. The site office will be used to provide staff facilities and carry out administration tasks including health and safety matters. KeaX propose to use a relocatable office building for this purpose, which will be serviced with a small solar panel and battery system. This is shown in the plans provided in **Appendix 8**.

Storage will be provided on site to provide a place to put materials (including tools, mounting fastenings, electrical equipment, health and safety equipment) until they are needed during construction. It is also proposed to retain storage on site once the solar array is operational to

ensure there are materials on hand to carry out essential maintenance or repairs. It is proposed to use four 40ft shipping containers for this purpose, located beside the site office building.

Fencing is proposed to be erected along the road boundaries for security. The fencing will be a chain link fence with barbed wire on top. The fencing will have a maximum height of 2.6m, and the fence posts will not exceed 3m in height. The fencing will be located behind the existing and proposed planting.

The security gates will be the same height as the fence: 2.6m.

No external lighting is required on the Site. In addition to staging, KeaX propose to ensure that potential adverse effects arising during the construction phases will be minimised as much as possible, by carrying out construction works during weekdays from 7:30am to 6pm.

4.2.1 Landscaping

It is proposed to retain all existing site boundary shelterbelts and vegetation to provide screening of the proposal and undertake planting to fill gaps and areas where there is currently no planting. This planting will be located between the site boundary and the security fencing to screen the fence and protect the planting from grazing animals within the Site.

It is proposed to undertake planting of fast growing, evergreen species, where this currently does not exist, as shown on the Landscape Mitigation Plan (**Appendix 13a**) and below in Figure 3 that will be 2m before construction commences, noting that where there is existing vegetation that needs to be replaced, a smaller grade of plant (shorter) will be planted. Plants will be maintained at a maximum of 3.5m in height.

In addition, as agreed with SDC, new planting along Branch Drain Road will be setback 10m into the Site and retained at 3.5m in height to manage shading effects. All new planting within and slightly beyond the existing gaps will be 2m in height before construction commences. Where the planting is directly behind vegetation that is already, or exceeds, 2m in height, plants will be 0.5-1.5m at the time of planting. The existing planting will be removed once the new plantings reach the required 3.5m in height.

An additional exotic shelterbelt will also be planted 10m from the boundary with 324 Branch Drain Road.

Figure 3: Landscape Plan

4.2.2 Earthworks

The earthworks are comprised of approximately 7,020.5m³ related to the following activities:

- driving piles of approximately 1.8m in depth which will support the frames of solar panels;
- trenching of up to 1m depth to lay the cables which connect the frames of solar panels together and to the inverters, and also connect the solar array to the Brookside Substation; and
- minimal topsoil disturbance to prepare areas for the relocatable buildings, inverters, and future battery sites.
- spreading of gravel to form internal tracks, where required.

To install each panel of solar panels, KeaX will pile drive piles into the ground which will hold up each set of panels and carry out trenching to enable installation of cables. The piling will be carried out using pile-driving machines which means that excavation is not required. Several piling machines will be used to minimise the total length of time needed for the pile driving stage of work. The pile driving machine(s) will only be used for approximately six months.

In total approximately 63.2m³/ha (7,020.5m³)of earthworks is estimated to be required to install the cable trenches, which will be backfilled once the cables are in place. Trenches will also be needed to install the cables for the inverters and to connect the Orion network (the Brookside Substation is located adjacent to the north-western corner of the Site) which the solar farm will connect to.

Due to the nature of the works, only a small area of earth will be exposed during the trenching and pile driving. It is therefore anticipated that, for the vast majority of the earthworks, dust and

sedimentation effects can be readily managed. The internal tracks/accessways will be informal and no soil scraping is proposed to establish these. Instead, they will be small tracks between the solar panels (as created by farm machinery), in the areas shown on the proposed plans in **Appendix 4,** and shingle will be used where required to fill potholes and prevent generation of muddy areas. No stockpiling of material is proposed.

The fencing installed around the Wāhi Taonga Management Site – C59, as a part of the site preparation works, will remain in place throughout the construction period. No earthworks are proposed within this area or within 10m of the water race that runs adjacent to the Branch Drain Road boundary.

It is proposed to implement an Erosion and Sediment Control Plan (ESCP) that will incorporate a Dust Management Plan (DMP) as a precautionary measure to ensure that dust and sedimentation effects are mitigated as much as practicable and protect the water races surrounding the Site. The general principles that will be adopted during the earthworks activities and incorporated in the ESCP are as follows:

- Minimise the disturbance area due to earthwork activities as far as practicable, while satisfying all requirements for construction of the site.
- Progressively stabilise exposed areas following completion.
- Divert all clean water runoff away from exposed earthworks areas, thus reducing the contribution of the site to the catchment.
- Intercept sediment-laden runoff from exposed areas with sediment retention ponds to provide filtration and retention of sediment prior to discharging to the downstream environment.
- Implement measures to prevent construction traffic exiting the construction area onto public roads with sediment and other materials attached to the undercarriage and tyres.
- Ensure the exposed earthwork areas remain in a damp condition, utilising water trucks as necessary, until surfaces have been stabilised.
- Regularly inspect the erosion and sediment control measures and undertake any maintenance necessary to maximise the potential retention of sediment on the site.
- In the event of a heavy rain forecast, stabilise the site as far as practicable and cease works until weather becomes suitable to recommence works.
- If necessary, earthwork activities may be limited in specific areas during periods of high wind.
- Ongoing assessment of the erosion and sediment control measures and, if required, adjustments as the work progresses.
- Ensure site staff are aware of the requirements of the E&SCP and the relevant resource consent conditions prior to the works commencing.
- Ensure that after hours contact details are available.

These principles are generally in accordance with the Environment Canterbury (ECan) Erosion and Sediment Control Online Toolbox for erosion and sediment control.

Furthermore, the earthworks contract developed for the Site will place specific responsibilities on the contractor for the environmental management of the Site. As part of this management, the contractor will be responsible for providing and maintaining adequate erosion and sediment

control measures to protect the water races, surrounding sites and adjoining public road network.

The potential adverse effects of the proposed earthworks and construction activities will be appropriately managed through the ESCP and dust will be controlled through the use of a dust management plan to ensure no offensive or objectionable effects beyond the site boundary.

4.3 Buildings

In addition to the solar panel frames, KeaX propose to construct several buildings across the Site. As noted in section 4.0 above, these buildings are located throughout the Site. Refer to **Appendices 6, 7 and 8** for plans and elevations, and photos. The number and nature of permanent buildings proposed to be located on the Site is as follows:

- 1 Single Skid Inverter – 10.2m long, 2.1m wide, and 2.25m high, covering an area of approximately 21.42m².
- 12 Twin Skid Inverter –9.2m long, 5.4m wide, and 2.35m high, covering an area of approximately 25m².
- Site office as shown in the plans in **Appendix 8**. This will be 12m in length and 4.198m in width, covering an area of approximately 50.4m².
- Storage buildings for retaining equipment and materials on site: Comprised of four 40ft shipping containers approximately 59.4m² each (12.19m long, 2.44m wide, and 2.59m high).
- One future battery site, situated in the middle of the site shown on **Appendix 4** there will be 14 x 40ft batteries

The panels will be located at least 14m from Branch Drain Road given that planting will be located at least 10m into the Site as shown on the Site Plan. and there will be at least 50m between the panels and the site boundary with 324 Branch Drain Road.

4.4 Servicing

4.4.1 Three waters

It is intended to truck potable water to the Site to meet drinking water demands for construction workers and staff as required. An above ground water tank, with a capacity of up to 5,000L will be situated on the site adjacent to the Site Office to provide drinking water and service the ablutions. The water tank will be filled with potable water offsite and trucked to the site as required.

The permanent site office and staffroom will be self-contained having a surface effluent tank (2,700L capacity) that will be emptied as required, via a truck that will take sewerage offsite to be disposed of appropriately at an authorised facility.

Stormwater runoff from the proposed buildings and structures will be discharged to ground as there is no reticulated stormwater system in this area. The proposed internal tracks will be constructed using shingle only and will therefore be permeable allowing stormwater drainage direct to ground.4.4.2 Traffic generation, access, and car parking

Vehicle access to the Site both during construction and operation will be via an existing vehicle access point, as shown on the plan in **Appendix 4**. This will need to be upgraded to meet SDC's required standard for heavy truck movements.

During construction, the total number of equivalent car movements per day during the construction phase will be 60 (averaged over a week). This will be split between staff vehicles entering and leaving the site each day and delivery trucks.

Delivery of materials (including aggregate for tracks, inverters and containers, and the construction materials for the solar arrays) will be made using heavy goods vehicles. Other equipment will be required at times e.g. pile driving machinery. The numbers and scale of vehicles will range depending on the deliveries and will require up to 6 trucks to enter and exit the Site per day at times during the construction period. This equates to 30 equivalent car movements (ecm). The number of staff vehicles will be approximately 12 staff vehicles, which equates to 24 equivalent car movements (ecm).

Car parking and manoeuvring for all light and heavy vehicles will be provided within the Site. It is proposed for car parking to be accommodated informally well within the Site, away from road boundaries, site boundaries and dwellings. This will also ensure that heavy vehicles can park clear of the road to load/unload materials and not reverse out onto Branch Drain Road.

The proposed layout of the solar array provides space for internal tracks to ensure easy access for both construction vehicles moving through the Site, and for maintenance access once construction of the solar farm is complete. The internal tracking will be created using flattened grass areas, with shingle as required to reduce the build-up of mud and tracking of sediment off-site.

4.5 Connections

KeaX has approached Orion New Zealand Ltd (Orion) to discuss connecting the solar farm to the local electricity grid. Orion is the electricity network distributer responsible for ensuring the distribution of power to more than 211,000 households across central Canterbury.

Orion own and operate the substation situated to the north-western corner of the Site. The substation site is designated. In discussions between KeaX and Orion, Orion have expressed their support for the development and KeaX intends to work closely with Orion throughout the life of the project.

To connect the solar array to the substation, KeaX will lay cables that will extend from the solar array to the Substation. Upgrade work will be required at the substation as the load increases; however, Orion has agreed to undertake this work, and this is outside the scope of this application.

The proposal will not require any overhead transmission lines.

4.6 Operation

The ongoing operation and maintenance will be largely a passive activity.

Whilst the Site is currently used for dairy farming, these operations will cease once construction commences. Once construction is complete, to manage grass growth across the site, it is proposed to continue pastoral land uses (e.g., small animals grazing) or other primary production activities. The primary production land use activities will be managed by the landowner.

Staff will not need to be on site on a permanent basis, only occasionally visiting to check site operations and carry out maintenance as required. It is anticipated that only 1 - 2 staff will need to visit the Site approximately once a month. This will equate to around four vehicle trips per month when staff visit the site to check the solar array is operating as it should and carry out any maintenance

It is proposed to retain the Site Office and Storage Containers to support ongoing operations once construction is complete. These buildings will provide staff facilities and space to store equipment, including tools and spare parts to ensure repairs and maintenance can be carried out on site when needed.

The fencing installed surrounding the Wāhi Taonga Management Site – C59, as a part of the site preparation works, will remain in place throughout the operation of the solar array.

5.0 Reasons for the Application

5.1 Selwyn District Plan Review

The Operative Selwyn District Plan (OSDP) is currently under review through a proposed District Plan (PDP) process. Following the initial public notification process in October 2020 and further submissions stage in April 2021, hearings are now underway until approximately June 2022. Decisions on the Proposed District Plan (PDP) are not due until October 2022, from which time the plan can be treated as operative provided there are no appeals.

As the PDP is still going through the hearings process, limited weighting can be given to the provisions. However, in accordance with s86B of the RMA, the rules relating to water, air, soil, the protection of significant habitats for indigenous fauna and historic heritage have immediate legal effect. All other rules have no legal effect until the plan becomes operative.

The objectives and policies of the PDP do have immediate effect from notification, but full weight cannot be placed on them as they have not been through the hearing and evaluation process. Objectives and policies in a proposed plan are considered to be relevant in understanding the direction of associated rules.

Therefore, this application needs to be assessed under both the operative and proposed plans, with the objectives and policies in the OSDP and PDP being relevant, and consideration being given to any rules in the PDP that have immediate effect.

5.2 Operative Selwyn District Plan

The Site is within the Outer Plains zone. This zone provides for farming activities, including horticulture, and outdoor recreational activities where they support and enhance the nature conservation and landscape values within the zone. Activities within the zone are to be managed in a way that "sustains the life supporting capacity of the soil and vegetation". The zone includes much of the rural landscape across the Plains, stretching from the sea and Lake Ellesmere to the Malvern Hills.

The overlays that apply to the Site include a Wāhi Taonga Management Site (C59) identified on the planning maps, situated between 150 Buckleys Road and 821 Hanmer Road. This Management Site is listed in Appendix E5 of the OSDP as being identified as containing Ovens/Middens. There are no other overlays listed in the OSDP that apply to the site.

The proposed solar array is defined as a "utility" in the OSDP. The definition of "Utility" is as follows:

> *includes the **use of any structure, building or land** for any of the following purposes:*
> ***(a) The generation, transformation and/or transmission of energy;***
> *(b) ….*

A solar panel, a battery, and an inverter is defined as a 'Utility Structure' - *includes any device, equipment or other facility which is used principally to house or support a utility including any antenna, mast, pole or pylon; or any structure housing a utility which is less than 10m^2 in gross floor area, or less than 2.5m in height.*

A staff office building and storage unit is defined as a 'Utility Building' - *includes any building or part of any building which is a utility or which is used principally to house or support a utility; and that building is 10m^2 or more in gross floor area and 2.5m or greater in height*.

As outlined above, the new solar array includes frames of solar panels, inverters, future batteries for the storage and management of energy, and a staff office building and lunchroom, as well as the use of containers for long term storage of materials. All of the structures proposed fall under the definitions outlined above, and therefore the proposal needs to be assessed against the utility's provisions in the OSDP.

An assessment of the proposal against the applicable provisions in the OSDP is outlined in **Appendix 10**.

The proposal is a discretionary activity and requires resource consent pursuant to the Operative District Plan under the following rules:

Rule	Activity	Status
Rule 5.1.3	The solar array will generate electricity that will not be used on the Site, and therefore the activity does not meet the requirements under Rule 5.1.2.4.	Discretionary
Rule 1.7.1.2	Earthworks to an approximate volume of 7,020.5m^3 are proposed across the three stages which exceeds the maximum volume of 5,000m^3 specified in Rule 1.7.1.2.	Discretionary
Rule 3.15.4	Buildings are proposed to be relocated onto and will remain permanently on the Site.	Controlled

The proposal overall is a **Discretionary Activity** under the OSDP.

5.3 National Environmental Standard for Assessing and Managing Contaminants in Soil

The National Environment Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES) states that the NES applies when a person wants to sample the soil on a piece of land, disturb the soil of the piece of land, or change the use of the piece of land, which means changing it to a use that is reasonably likely to harm human health, if the piece of land (subclause 7):

- has an activity or industry described in the Hazardous Activities and Industries List (HAIL) being undertaken on it, or
- an activity or industry described in the HAIL has been undertaken on it, or
- it is more likely than not that an activity or industry described in the HAIL is being or has been undertaken on it.

The following activities, of relevance, are listed in HAIL:

A Chemical manufacture, application and bulk storage

1. Agrichemicals including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application.
6. Fertiliser manufacture or bulk storage.
8. Livestock dip or spray race operations.
10. Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds
17. Storage tanks or drums for fuel, chemicals or liquid waste.

Firstly, it needs to be determined if a HAIL activity is occurring, has or is likely to have, occurred within the Site. An analysis of aerial photographs and the knowledge of the Applicant provides no evidence of the manufacture, bulk storage of agrichemicals, fertiliser manufacture or bulk storage, livestock dip or spray race operations or persistent pesticide bulk storage or use within the Site. However, given that the Site was, and will continue to be used, as production land for grazing, it is likely that agrichemicals (fertilisers) were/will continue to be applied to the land. It can therefore be concluded that a HAIL activity has and will continue to occur on the Site.

Clause 8 states that if a piece of land described in subclause (7) is production land, these regulations apply if the person wants to—

Activity	Comment
(a)remove a fuel storage system from the piece of land or replace a fuel storage system in or on the piece of land:	It is not proposed to remove a fuel storage system.
(b)sample or disturb— (i)soil under existing residential buildings on the piece of land: (ii)soil used for the farmhouse garden or other residential purposes in the immediate vicinity of existing residential buildings: (iii)soil that would be under proposed residential buildings on the piece of land: (iv)soil that would be used for the farmhouse garden or other residential purposes in the immediate vicinity of proposed residential buildings:	There is not and never has been residential buildings on the Site.

(c)subdivide land in a way that causes the piece of land to stop being production land:	It is not proposed to subdivide the Site.
(d)change the use of the piece of land in a way that causes the piece of land to **stop** being production land.	The land **will not stop** being production land as it will be used for primary production.

Consequently, it is considered that Site is not subject to the provisions of the NES and therefore no consent is required.

5.4 Other statutory documents

Proposal will not trigger any requirements for consent under the National Environmental Standard for Freshwater Management.

5.5 Activity Status

Overall, the proposal is considered a **Discretionary activity** under the OSDP.

6.0 Assessment of Environmental Effects

6.1 Ecological Effects

Boffa Miskell Limited ecologists were engaged by KeaX to undertake a desktop terrestrial ecological assessment of the proposed solar farm site and to provide a high-level Ecological Impact Assessment (EcIA) memo to accompany the resource consent applications for the proposed solar farm. This assessment is attached in **Appendix 12** and summarised below**.**

The Site is located within the Canterbury Plains Ecological Region and the Low Plains Ecological District (ED). The original vegetation of the Low Plains ED has been substantially depleted by human induced fire and land clearance for agriculture and settlement. Nearly all of the ED is intensively farmed or built, and only 0.5% of the ED is still covered in indigenous vegetation (McEwen 1987, Ecroyd and Brockerhoff 2005, Harding 2009). The entire solar farm site is located within what is known as an acutely threatened land environment, where only 10% or less indigenous vegetation remains (Walker et al. 2015). This means that indigenous vegetation, if present, would be of priority for biodiversity protection on private land (MFE 2007). However, analysis of aerial imagery and GIS databases suggests that the Site does not contain any wetlands, indigenous vegetation, or waterways.

Based on the desktop findings as set out in the Ecology Memo, it is considered that the Site does not meet any of the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity, as listed in Appendix 3 of the Canterbury Regional Policy Statement (CRPS). As such, the Site is not significant in terms of the CRPS. Drains that surround the Site that support Canterbury mudfish are significant in terms of the CRPS.

Terrestrial Vegetation

The proposal will not result in the clearance of indigenous vegetation and hence there is no ecological effect of the proposal in terms of indigenous vegetation on the Site. In consideration of the Negligible values of the planted shelterbelts and exotic pasture habitats present, and the extent of similar habitat types in the surrounding area, any change induced by the presence of panels would likely correspond to a Negligible magnitude of effect (refer to appendices contained in the ecology assessment) and hence a **Very Low** level of ecological effect.

Avifauna

The permanent loss of habitat at the Site to construct buildings/structures and clear shelterbelts would affect a very small proportion of the Site, which in general offers only very low quality and largely occasional or temporary feeding habitat for a limited range of indigenous and exotic bird species. Existing shelterbelts may have some function as connecting habitat for indigenous forest bird species, and these species would be unlikely to use cleared areas or solar panel arrays as habitat.

In the context of the quality of the habitat that would be modified, and the very large extent of surrounding similar habitat in the immediate area and in the wider ED. Therefore, the magnitude of ecological effect during the construction of solar farm in terms of bird disturbance is expected to be Negligible, constituting a **Very Low** level of effect.

It has been recognised internationally that bird deaths from trauma due to collision with solar photovoltaic structures (panels) are possible (Kagan 2014, Bennun et al. 2021). It is not known whether this possible ecological impact would occur at this Site, or whether indigenous species would be more or less susceptible than exotic species, but it appears more likely (based on the above information) that it would affect a small number of indigenous birds, if any. Taking a precautionary approach, disturbance during operation of the solar farm, this effect may be possible, but the magnitude of ecological effect would be Negligible, constituting a **Very Low** to **Low** level of effect.

Other

The reflection of polarised light from solar panels has been speculated to have potential adverse effects to some emerged (adult) freshwater invertebrate taxa (particularly mayflies, stoneflies, and dipterans) that are naturally attracted to the similar light refraction properties of water (ponds). Invertebrates may therefore lay eggs on solar panels, thinking it to be ordinary pond habitat, leading to breeding failure (Horvarth et al. 2010). In the context of this proposal, this possible effect is considered unlikely to be of any ecological concern, as it is (as noted above) unlikely that any important populations of indigenous invertebrates are present at the Site. Furthermore, given that works will be within the existing farmed area, and setback 10m from the site boundaries, the proposal will not have any effects on surrounding waterways that support Canterbury mudfish.

Overall conclusions on ecological effects of solar array

Overall, the solar farm site is a highly modified area that is intensively cultivated. It contains generally **Negligible** ecological values in terms of vegetation and habitats. The c. 111 ha site proposed to be developed for the solar farm likely generally supports widespread and common indigenous bird species. The Site may on occasion provide habitat for a small number of bird species of High or even Very High ecological value, but adjacent and extensive similar habitat is available in the surrounding area and in areas between solar panel arrays.

Based on the conclusions of the ecological assessment, outlined above and in **Appendix 12,** the level of effect of the construction and operation of the proposed solar farm on ecological values is expected to be very low, constituting a less than minor adverse effect. However, on a precautionary basis the level of effect could possibly be Low (less than minor) if bird strike to some indigenous species were to occur, and monitoring of this possible effect could be considered.

6.2 Effects on Visual Amenity and Landscape Assessment

Boffa Miskell Ltd landscape planners were engaged by KeaX to undertake a Landscape and Visual Effects Assessment (LVEA). The LVEA can be found in **Appendix 13** and a summary is provided below.

Due to the flat topography of this landscape including the Site and intervening vegetation, the visual catchment of the Site is limited to the immediate surrounding area. The viewing audience includes private properties neighbouring the Site boundary and road users of Buckleys Road, Caldwells Road, Grahams Road, Branch Drain Road, Smythes Road and Irwell Rakaia Road. The particular effects of the proposal relate to the physical environment, rural character, and

visual amenity effects from public and private locations, and these effects are summarised below.

Physical Landscape Effects

The assessment of physical effects considers the nature and significance of modifications to the landform of the Site and existing vegetation.

The flat topography across the Site will remain unchanged as no large bulk earthworks will be required. Minor soil disturbance will be required for the construction of the i tracking solar panels, inverters, buildings, cable trenching and security fencing around the Site. The foundations to support the solar panel frames will be pile driven into the ground to minimise the overall earthworks required on Site.

Existing Site boundary vegetation will be retained, however all existing trees and shelterbelts within the wider Site will be removed to make way for the proposal. Although, the Site will remain grassed and be utilised for grazing. The proposed mitigation planting will be implemented along the full extent of the road boundaries to assist with reducing the visibility of the solar farm structures when viewed from the immediate context.

The removal of all internal vegetation that relates to the Sites' character will have a temporary adverse effect resulting in less than minor effects (low). Once the landscape buffer planting is fully established along the Site boundaries, the removal of the internal vegetation will be indiscernible.

Rural Character Effects

The Site will transition from a rural productive landscape to that of a landscape containing energy infrastructure. The large expanse of open space will be reduced to areas between and beneath the solar panels, although grazing animals, such as sheep, will continue to manage pasture growth beneath the panels and frames and will assist in maintaining a sense of rural character. Overall, the general form and pattern of the Site will be retained, thereby maintaining a key characteristic of the rural landscape.

The proposed solar panels will have a low profile in the context of the flat topography and the surrounding vegetation. Due to this, the solar farm is not expected to be a prominent feature in the landscape when viewed from beyond the immediate context of the Site. Any anticipated effects on the landscape character will be very localised.

The 3m wide buffer planting will assist in integrating the Proposal into the landscape, softening the visual aspects of the infrastructure and providing a vegetative backdrop as well as screening from the neighbouring private properties and public roads while visually containing the proposal.

The Proposal will result in a very localised, minor (low-moderate) adverse effect on the rural character values and amenity of the Site. This relates to the removal of internal vegetation, introduction of solar panel structures and associated infrastructure. However, as all mitigation planting grows and establishes along the site boundaries, the solar farm will be visually contained, and adverse effects on rural character will reduce to less than minor (low (adverse).

Visual Effects

Due to the flat topography of this landscape, the visual catchment of the Site is limited to the immediate surrounding area. The viewing audience includes private properties neighbouring the

Site boundary and road users of Buckleys, Hanmer, Caldwells, Grahams, Branch Drain and Smythes Roads. The viewing audiences are detailed in section 6.2 of the LVEA in **Appendix 13**.

From the 610m length of Buckleys Road that borders the Site adverse visual effects will be minor (low-moderate adverse) without mitigation (landscape planting) reducing to less than minor (very low adverse) with mitigation. Where existing vegetation exists along the remaining lengths of Buckleys Road, a very low (adverse) visual effect is anticipated on the users of the road as the Proposal will be visually contained within the Site boundary.

From Branch Drain Road visual effects will vary along the 840m length of Branch Drain Road that borders the Site due to the existing vegetation. A minor (low-moderate adverse) visual effect will occur along the short, open stretches where filtered views of the Proposal will be apparent through newly established 2m high mitigation planting. This will reduce to less than minor (very low adverse) as the mitigation planting establishes. Where existing vegetation exists along the remaining length of Branch Drain Road and the Proposal is setback approximately 695m, a less than minor (very low adverse) visual effect is anticipated on the users of the road as the Proposal will predominately be visually contained within the Site boundary.

An approximate 325m length of the southern site boundary does not currently have any form of screening. However, this gap will be filled with two staggered rows of 2m tall fast growing evergreen exotic shelterbelt plant species. The proposed mitigation planting will initially filter views of the Proposal and due to the long-distance viewing location, intervening vegetation, tracking solar system and 2m tall plants implemented prior to the construction of the solar farm, visual effects will be less than minor (low adverse). This will reduce to less than minor (very low adverse) as the planting establishes and grows to fill out the gap and reaches a height of 3m – 3.5m.

From Hanmer, Caldwells and Smythes Roads, adverse visual effects resulting from the Proposal will be less than minor (low adverse) due to the long-distance viewing location, tracking solar system and 2m tall plants implemented prior to the construction of the solar farm. As the planting establishes and grows to fill out the gap and reaches a height of 3m – 3.5m, visual effects will reduce to less than minor (very low adverse).

From private locations, the adverse visual effects range from neutral to low (adverse) (without mitigation) depending on the viewing distance to the Site, intervening vegetation and nature of the view. As the mitigation planting provides full screening of the Proposal, adverse visual effects will reduce to neutral - very low (adverse).

The table summarises the effects of the Proposal, without and with mitigation on private properties.

Address/Viewing Audience	**Visual Effect and Nature of Effect**	
	2m high mitigation planting	**After 5yrs with mitigation planting**
105 Buckleys Road 79 Buckleys Road 80/56 Buckleys Road 23 Buckleys Road 883 Caldwells Road 932 Hanmer Road 381 Brookside and Irwell Road 375 Brookside and Irwell Road 365 Brookside and Irwell Road 870 Hanmer Road 191 Branch Drain Road	Neutral	Neutral

229 Branch Drain Road 233 Branch Drain Road 265 Branch Drain Road 277 Branch Drain Road 29 Irwell Rakaia Road 43 Dunsandel and Brookside Road 15 Stewarts Road 10 Stewarts Road Lot 1 DP 77659 & Lot 2 DP 77659		
851 Caldwells Road	Very Low (adverse)	Very Low (adverse)
180 Grahams Road 198 Branch Drain Road 313 Branch Drain Road 324 Branch Drain Road 121 Irwell Rakaia Road	Very Low (adverse)	Neutral

Overall, it is concluded that adverse effects on private properties will be less than minor.

6.3 Cultural Effects

Boffa Miskell Ltd's cultural advisor was engaged by KeaX to assist with engaging with the Te Taumutu rūnanga and determining any effects the solar array may have on cultural values.

In summary, the OSDP identifies a Wāhi Taonga Management Site – C59 lies partly within the solar array Site. The OSDP states that C59 is ovens/middens.

The Plan seeks to protect sites identified as Wāhi Taonga Sites, and Wāhi Taonga Management Areas, including by fostering a partnership between landholders and local Rūnanga. The applicant has engaged with Te Taumutu Rūnanga, both directly and via Mahaanui Kurataio Ltd.

The applicant proposes to place a 50m fenced exclusion buffer around the site within which no earthworks will be undertaken, or solar panels constructed. It is considered that the 50m buffer area will ensure that the risk of adverse effects on the Wāhi Taonga Management Site – C59 are minimised. It is also proposed to implement an Accidental Discovery Protocol across the Site in case any unexpected artefacts are encountered during the works.

Mahaanui Kurataio Ltd (MKT) has confirmed that the proposed fencing and the proposed 50m setback from earthworks are deemed to be sufficient to protect this Site.

Overall, it is considered that potential adverse effects on the cultural values of the Site will be less than minor.

6.4 Construction Effects

It is proposed that potential effects related to the earthworks and construction activities will be managed by an ESCP and dust management plan approach.

The construction of the solar farm will likely take between 12 months to complete. The existing shelter belts will also provide some wind protection and minimise the risk of discharging dust onto adjoining properties and public roads. Also, prior to construction commencing, it is intended to plant the identified gaps in the shelter belts and site boundary with exotic plants during the first planting season after consent has been granted.

KeaX propose to ensure that construction hours of operation are restricted to weekdays from 7.30am to 6pm. The Acoustic Assessment prepared by Acoustic Engineering Services Ltd (AES) (**Appendix 15**) concludes that noise and vibration from construction activities can generally comply with the Operative and District Plan noise limits and guidelines, noting that the panels will be located so that there is a 50 metre setback between the piling rig and any nearby dwellings. It is expected that vibration from the piling activity (most vibration intensive) will comply with the relevant guideline values.

However, whilst noise from construction activity will comply with the noise limits, the duration of the construction activity (one year), and the likelihood that noise levels will at times be significantly higher than the background noise levels, it is appropriate to be considerate of neighbours to minimise noise effects as far as practicable. AES therefore recommends preparing and implementing a Noise Management Plan (NMP). This will be a relatively brief document in this case, prepared in accordance with NZS 6803 and include community relations management. The Applicant is accepting of a condition requiring this.

Earthworks will be controlled using an Erosion and Sediment Control Plan and dust will be managed by way of a Dust Management Plan to ensure no offensive or objectionable effects occur beyond the site boundaries. The implementation of the construction approach, staging and management plans will ensure that any adverse construction effects are avoided or managed appropriately.

Earthworks

To construct the solar array, earthworks are proposed to a maximum volume of 7,020.5m³ and a maximum trench depth of 1m, with piles being driven to 1.8m into the ground, where the highest recorded groundwater level in the vicinity of the Site is 0.22m below ground level. However, groundwater encountered during recent geotechnical investigations was 2-3m below ground level.

Earthworks can have adverse effects on the quality of water in surface waterbodies, where sediments or contaminants may enter water. The Site is relatively close to a waterbody, therefore careful consideration of the effects of earthworks on water quality and the protection of the adjacent waterway is required.

It is noted that earthworks for the digging of post holes is exempt from the earthwork rules in the Selwyn District Plan. Piling driving the piles for the solar panels is a similar activity and whilst not exempted from the rules is unlikely to result in adverse effects on groundwater quality given the minimal disturbance of the land, and that a pile will then essentially seal the hole minimising the risk of contaminants entering any groundwater.

Given the ground water surface level has been measured as being on average 2-3m below ground level, this will likely still leave 1-2m between the proposed excavation base of the cable trenches and likely groundwater level. As such, it is not anticipated that groundwater will be exposed during the excavations. Any cuts will be filled with free-draining material to protect the groundwater. Furthermore, the earthworks will occur in accordance with an Erosion and Sediment Control Plan to ensure any potential for sedimentation and erosion effects are avoided or mitigated as much as possible.

The Erosion and Sediment Control Plan approach and principles are set out in the proposal description. The implementation of the construction approach, staging and management plans will ensure that any adverse effects are avoided or mitigated appropriately.

Heavy vehicles coming to the Site to deliver materials or machinery will use the upgraded vehicle access point located on the western boundary of the Site. The internal tracks will remain grassed and will be gravelled as required to manage potential dust and sediment issues. Once construction is complete grass will be allowed to grow and thus minimise the risk of sediment running-off or blowing off the Site.

The Site partly contains a Wāhi Taonga Management Site – C59 and it has been agreed with Te Taumutu Rūnanga to place a 50m fenced exclusion buffer around the site within which no earthworks will be undertaken, or solar panels constructed. It is considered that the 50m buffer area will ensure that the risk of adverse effects on the are minimised. It is also proposed to implement an Accidental Discovery Protocol across the Site in case any unexpected artefacts are encountered during the works.

Taking into account:

- the separation distance between the earthworks and site boundaries and the water race, and
- that works will proceed in accordance with the Erosion and Sediment Control Plan, and
- the use of gravel on the internal tracks to manage dust and the creation of muddy areas.
- the 50m buffer around the Wāhi Taonga Management Site – C59.

it is considered that the effects of the proposed earthworks on the amenity of the surrounding area and groundwater quality can be effectively managed.

6.5 Operational Effects

Once the solar array is operational, the traffic generated by the proposal will likely be approximately four vehicle trips per month when staff visit the site to check the solar array and carry out any maintenance.

Noise generated by the solar array will be minimal as there are no moving parts or mechanical elements such as turbines, that generate noise. 324 Branch Drain Road will receive the highest noise levels, where the operational noise is expected to be up to 47 dB LAeq (15 min) (which is well within the Operative SDP noise limits) close to the northern façade of the dwelling. The noise levels inside the dwelling will be in the order of 10 to 17 dB lower (with windows open) than the external levels, depending on the aspect of the internal spaces. Overall, it is expected that even for this property, noise will not interfere with typical domestic activities. Furthermore, operational noise will be limited to the following level (measured and assessed in accordance with NZS 6801:2008 and NZS 6802:2008 respectively), when received at the notional boundary of neighbouring dwellings:

- Daytime (7:30 am to 8:00 pm) - 50 dB LAeq (15 minute)

The nominated LAeq based noise limit is more stringent than the District Plan noise limits but is consistent with the lower WHO threshold for the protection of residential amenity. Analysis by AES confirms that the operational noise levels are expected to comply with this criterion. The noise from the operation of the solar farm will also be 10 dB or more below the operative district plan noise limits.

Overall, the Acoustic Assessment concludes that the operation of the solar farm will comply with the Operative District Plan noise limits.

Traffic noise may be noticeable, with vehicles travelling to and from the Site, however such noise is commensurate with other activities in the area and indeed to a lesser degree than the current dairy farming activity onsite.

The solar array will operate during daytime hours being 7.30am to 8pm once it is switched on. However, as outlined earlier, the generation of solar energy is largely a passive activity that requires minimal activity and occasional maintenance. Primary production (initially likely to e sheep grazing) is also proposed across the Site, with the solar panels being set at an angle (between 3m and 500mm) above the ground providing space for the sheep to graze underneath. This will maintain an element of rural character and amenity on the Site.

A glint and glare assessment has been prepared by Boffa Miskell (**Appendix 13 in the LVEA**) to consider potential glint and glare effects that could arise from the solar array. The assessment concludes that:

- glare will only be present in one location– at the junction of Caldwells and Hanmer Roads, where the roads align with a gap in the proposed screening to accommodate the identified Wahi Taonga site. It is therefore recommended that panels in this section of the solar farm incorporate no backtracking (where panels backtrack at the beginning and end of the day to avoid the effects of shading), to avoid the potential for glare at this location.
- along all other roads, potential glare will be screened by the proposed shelterbelt planting around the Site.
- potential glint and glare effects on private properties will be less than minor because of the duration of any potential glare, distance from the Site and vegetation that obscures views, and therefore potential glare.

Overall, it is concluded that operational effects on both immediately adjoining neighbouring property owners and occupiers and the wider environment will be less than minor.

6.6 Battery storage and managing other environmental risks on the site

The Applicant has multiple interests in keeping grass levels down such as grazing income, panel efficiency, reduction of fire risk, and maintaining rural character and amenity. The grass will therefore be grazed as long grass could interfere with the effectiveness of the panels.

Under the Health and Safety at Work Act and Fire and Emergency Act, the Applicant will need to provide a Health and Safety Management Plan and a Fire Emergency Plan. The Fire Emergency Plan will need to be approved by the local fire service.

The Electrical Codes of Practice are a requirement under the Electricity Act which has standards that the Applicant will also need to comply with. Relevant standards are listed below, but are not limited to:

- ASNZS1768: Lightning protection.
- ASNZS2067: Substations and high voltage installations exceeding 1 kV a.c.

- ASNZS5033: General installation and safety requirements for electrical installations of PV array.
- ASNZS4777: Grid connection of energy systems via inverters, Part 2: Inverter requirements.
- ASNZS3000: Electrical installations - Known as the Australian/New Zealand Wiring Rules.
- ASNZS5139: Electrical installations - Safety of battery systems for use with power conversion equipment.
- Electricity Industry Act 2010.
- Electricity Industry Participation Code 2010.
- Electricity Safety Regulations 2010.

6.7 Positive Effects

This project is an exciting and significant step for both KeaX and renewable energy generation in the South Island, with the energy generated anticipated to be sufficient to supply, on average, 11,000 homes in Canterbury annually. The proposal will assist in meeting national targets in increasing electricity generation from renewable energy and reducing reliance on non-renewables. Furthermore, this electricity will be generated in proximity to large populations including Rolleston, Lincoln, and Christchurch, thus reducing the need for long transmission distances.

The solar array will require the current dairy farm operation on the Site to cease once construction of the panels commences, with expected resulting benefits in terms of reduced nitrogen being discharged to groundwater and a significant reduction in the volume of water being used for irrigation. In Canterbury, these are significant matters of concern, noting that the land could return to dairy farming or another rural productive use in the future if the panels are removed.

However, an additional benefit is the ability to use the Site for two purposes: primary production and the generation of renewable electricity.

Relationship with Government Direction and Policy

A new domestic emissions reduction target by 2050 was set into law with the Climate Change Response (Zero Carbon) Amendment Act in November 2019. The Climate Change Response (Zero Carbon) Amendment Act 2019 provides a framework by which New Zealand can develop and implement clear and stable climate change policies that:

- contribute to the global effort under the Paris Agreement to limit the global average temperature increase to 1.5° Celsius above pre-industrial levels
- allow New Zealand to prepare for, and adapt to, the effects of climate change.

The changes do four key things:

- set a new domestic greenhouse gas emissions reduction target for New Zealand to:
    - reduce net emissions of all greenhouse gases (except biogenic methane) to zero by 2050.

    - reduce emissions of biogenic methane to 24–47 per cent below 2017 levels by 2050, including to 10 per cent below 2017 levels by 2030.
- establish a system of emissions budgets to act as stepping-stones towards the long-term target.
- require the Government to develop and implement policies for climate change adaptation and mitigation.
- establish a new, independent Climate Change Commission to provide expert advice and monitoring to help keep successive governments on track to meeting long-term goals.

This proposal will assist in reducing greenhouse gas emissions by reducing reliance on fossil fuels. It will also build resilience into the electricity generation network by reducing reliance on hydro electricity generation, which is under pressure due to changes in weather patterns that may be related to climate change. Furthermore, it will provide a locally generated, resilient electricity supply; reducing the need for long transmission distances and the costs associated with that. It may also assist with lowering the risk of unreliable supply due to issues such as earthquakes that can disrupt supply.

6.8 Conclusion of Assessment of Environmental Effects

It is concluded that the Proposal will result in less than minor effects on the environment as follows:

- vegetation will screen views from within and into the Site, properties are distance from the Site and where glare may occur at the junction of Caldwells and Hanmer Roads, the panels in this section of the solar farm will not backtrack. Along all other roads, potential glare will be screened by the proposed shelterbelt planting around the Site.
- private properties will generally be screened from potential glint and glare effects by established and proposed vegetation and further mitigation will be provided by distance from the Site and the very limited duration of any glare.
- the Site has been assessed as having low ecological values.
- a 50m buffer will apply around the Wāhi Taonga Management Site – C59, to protect this area and ensure no earthworks are undertaken that could adversely affect this site.
- earthworks will be undertaken in accordance with an ESCMP to manage potential adverse effects on ground and surface water, neighbouring properties and public roads.
- operational noise will meet the Operative District Plan noise limits.
- construction noise will also meet the Operative District Plan noise limits.
- extensive landscape planting will be undertaken along the boundaries of the Site and within the Site that will assist in screening the solar farm.
- the construction of solar panel arrays will occur outside of the main bird breeding season (September – January), to avoid adverse effects on breeding indigenous birds unless a pre-construction survey of the Site is carried out by a suitably qualified ecologist / ornithologist with over five years of experience conducting bird surveys to ensure that there are no breeding birds or where these are located, that area is avoided.

- there will be monitoring for bird strike and appropriate action taken, should this be determined to be an issue. The management actions required will be determined at a later stage in agreement with a suitably qualified ecologist / ornithologist, depending on the scale of the issue.
- the majority of traffic movements will occur during the construction of solar array as the operation of the array is generally a passive activity that requires low levels of monitoring.

7.0 Statutory Assessment

In accordance with Section 104(1) of the Resource Management Act 1991 ('RMA'), this part of the report addresses the following statutory documents which are relevant to the assessment of this proposal:

a) National Policy Statement for Renewable Electricity Generation 2011 (NPS-REG)

b) National Policy Statement for Highly Productive Land (NPS-HPL)

c) Canterbury Regional Policy Statement ('CRPS')

d) Operative Selwyn District Plan

e) Proposed Selwyn District Plan

f) Mahaanui Iwi Management Plan 2013.

g) Part 2 of the RMA

7.1 Section 104B

Section 104B states that, where considering an application for a discretionary activity, the consent authority may grant or refuse the application. If the activity is granted, the consent authority may impose conditions pursuant to Section 108.

7.2 National Policy Statement for Renewable Electricity Generation 2011

The National Policy Statement for Renewable Electricity Generation (NPS-REG) was gazetted in April 2011. However, whilst the Utility chapter of the SDP is dated October 2011, it does not appear to give effect to the NPS-REG.

The NPS-REG provides for the development, operation, maintenance, and upgrading of new and existing renewable electricity generation activities, such that the proportion of New Zealand's electricity generated from renewable energy sources increases to a level that meets or exceeds the New Zealand Government's national target for renewable electricity generation.

Of particular relevance to this proposal, the policies seek that decision-makers recognise the benefits of renewable electricity generation including increasing electricity generation capacity while avoiding, reducing, or displacing greenhouse gas emissions, and increasing local supplies through diversification of type and location of generation. The policies also seek that regard is had to meeting or exceeding the New Zealand Government's national target for the generation of electricity from renewable resources.

There is also clear direction to have 'particular regard' to the need to locate renewable electricity generation facilities where the renewable energy resource is available, and the location of the existing distribution network with regard to connecting to the national grid. The NPS-REG also enables the use of offsetting measures or environmental compensation to address residual environmental effects of establishing the renewable electricity facility.

The policies also clearly set out matters that district councils must address within their objectives, policies, and methods, including:

- Providing for the development, operation, maintenance, and upgrading of new and existing renewable electricity generation activities using solar, biomass, tidal, wave, and ocean current energy resources to the extent applicable to the region or district.
- Providing for the development, operation, maintenance, and upgrading of small and community-scale distributed renewable electricity generation from any renewable energy source to the extent applicable to the region or district.

Small and community-scale distributed electricity generation means renewable electricity generation for the purpose of using electricity on a particular site, or supplying an immediate community, or connecting into the distribution network.

Discussion

The proposal will accord with the objectives and policies of the NPS-REG by providing new electricity generation from solar energy (a renewable resource) in a location where the solar farm can efficiently connect into the local distribution network. It will also contribute to the diversification of the local electricity network, providing an alternative type of generation in a new location; whilst assisting a move towards the Government's national target for the generation of electricity from renewable resources.

7.3 National Policy Statement for Highly Productive Land

The NPS-HPL is intended to ensure the availability of New Zealand's most favourable soils for food and fibre production, now and for future generations. It was gazetted in September 2022 and had effect from 17th October 2022.

Highly productive land (HPL) means land that has been mapped in accordance with criteria set out in the NPS. However, until a regional policy statement containing maps of highly productive land in the region is operative, each relevant territorial authority must apply the NPS-HPL as if references to highly productive land were references to land that, at the commencement date:

(a) is

(i) zoned general rural or rural production; and

(ii) LUC 1, 2, or 3 land; but

(b) is not:

(i) identified for future urban development; or

(ii) subject to a Council initiated, or an adopted, notified plan change to rezone it from general rural or rural production to urban or rural lifestyle.

The Site is HPL is LUC 2 and 3, is not identified for future urban development; or subject to a Council initiated, or an adopted, notified plan change to rezone it from general rural or rural production to urban or rural lifestyle. Therefore, the provisions of the NPS-HPL apply to the Proposal.

The objectives and policies of relevance to the Proposal are the Objective and Policies 1, 2, 4, 8 and 9. The objective and policies seek to protect highly productive land from inappropriate use and development to enable it to be used for land-based primary production, both now and for future generations, recognizing that it has finite characteristics and long- term values. The identification and management of highly productive land is to be undertaken in an integrated

way that considers the interactions with freshwater management and urban development. Reverse sensitivity effects are managed so as not to constrain land-based primary production activities on highly productive land.

The objectives and policies are to be achieved through subsequent clauses in the NPS-HPL, the most relevant to this Proposal being clause 3.9.

Clause 3.9(1) of the NPS-HPL provides that '*[t]erritorial authorities must avoid the inappropriate use or development of highly productive land that is not land-based primary production*.'

The existing dairy farm operations at the Site will be phased out as construction moves across the Site. However, grazing of small animals, such as sheep, under and around the solar panels across the Site will continue, as may other forms of primary production, while the solar farm is in operation.

The combination of the new solar farm and the continuation of grazing activity means that the Site will continue to be used for land-based primary production, albeit a change from the current productive use. This means that the Proposal is not necessarily "caught" by clause 3.9(1) of the NPS-HPL, because it not seeking to solely enable a use or development of HPL that is not land-based primary production. Land-based primary production will continue on the Site.

Further, clause 3.9(1) refers to "inappropriate" use or development of HPL. Drawing guidance from the NPS-HPL objective and relevant policies, it is clear that the NPS-HPL is intended to ensure the availability of New Zealand's most favourable soils. The Proposal will require minimal earthworks (some trenching and piling) that will not disturb large areas of soil, which could affect its structure and quality vis-à-vis its productivity. As such, the Proposal is not an "inappropriate" use or development of HPL.

If it is considered that clause 3.9(1) does apply to the Proposal, clause 3.9(2) provides a list of "exemptions". As set out in clause 3.9(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:

(a) it provides for supporting activities on the land.

(b) it addresses a high risk to public health and safety.

(c) it is, or is for a purpose associated with, a matter of national importance under section 6 of the Act.

(d) it is on specified Māori land.

(e) it is for the purpose of protecting, maintaining, restoring, or enhancing indigenous biodiversity.

(f) it provides for the retirement of land from land-based primary production for the purpose of improving water quality.

(g) it is a small-scale or temporary land-use activity that has no impact on the productive capacity of the land.

(h) it is for an activity by a requiring authority in relation to a designation or notice of requirement under the Act.

(i) it provides for public access.

(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:…..

Clause 3.9(2)(j)(i) applies to the Proposal as it is proposed to construct a solar farm (specified infrastructure) on the Site.

The NPS-HPL: Guide to implementation (Part 1) dated December 2022 (the Guidelines) states that 'the intention of this clause is to recognise situations where the use or development of specified infrastructure, may occur on HPL. It then goes on to state that 'The key test is to demonstrate that the use and development has a 'functional need' and/or 'operational need' to be on HPL.

Specified infrastructure is defined in the NPS-HPL as including infrastructure that is recognised as regionally significant in a regional policy statement. The Canterbury Regional Policy Statement defines regionally significant infrastructure as including 'National, regional and local renewable electricity generation activities of any scale'. So, this Proposal can be defined as 'specified infrastructure' in terms of the NPS-HPL.

However, it still needs to be determined if it has an operational need to locate on HPL.

Solar farms require large, generally open sites with little internal vegetation or large scale buildings or structures on adjoining sites that could cause shading. Such sites are generally found in rural areas, although there may be some sites available in industrial areas, but these are likely to be few in number or of sufficient size. Other limitations are likely to relate to the availability of land for sale or lease, the price of land, access to infrastructure, land topography (steeply sloping land or undulating land can require excessive earthworks or the land itself can cause shading of panels), geology (it is difficult to pile into rocky ground), the presence of indigenous flora and fauna, outstanding natural landscapes or features and areas with outstanding natural character.

From a technical perspective, proximity to a substation is key. The cost of constructing a new substation is prohibitive for projects of the scale being proposed. Furthermore, choosing a site involves a range of extensive studies that include (but not exclusively) electricity modelling, land type (is it suitable for piles), proximity to infrastructure such as substations and power lines with capacity available, and sun hours. The Applicant investigated other substations in the Selwyn area, but all had their own constraints. However, it is clear that choosing a site is complex and involved, and the process essentially limits the locations where a solar farm can be located, without excessive costs that may well be passed on to the consumer or prohibit development altogether.

Therefore, there is a clear operational need for the solar farm to locate in proximity to the Brookside substation. The availability of an appropriate site dictated that the subject site was chosen.

The NPS-HPL (clause 3.9 (f)) states that a use or development of highly productive land is appropriate if it provides for the retirement of land from land-based primary production for the purpose of improving water quality. This does not automatically mean that the solar farm is also an appropriate use, as the matters outlined above in respect of 'operational or functional need' and 'specified infrastructure' for this activity still apply. However, it is useful context in terms of establishing the policy intentions of the NPS-HPL.

The Guidance document recognises that, in some situations, it may be necessary to retire portions of land from being actively used for land-based primary production, to improve water

quality standards under the National Policy Statement for Freshwater Management 2020 (NPS-FM).

The Site lies within the area managed under Section 11: Selwyn-Te Waihora of the Canterbury Land and Water Plan. It contains the following policy:

Reduce the total nitrogen load entering Te Waihora/Lake Ellesmere by restricting the losses of nitrogen from farming activities, industrial and trade processes and community sewerage systems in accordance with the target (the limit to be met over time) and limits in Tables 11(i) and 11(j).

Furthermore, nitrate-nitrogen concentration in groundwater is quite high. Whilst anecdotal, the replacement of dairy farming with solar panels and sheep farming or other less intensive primary production may reduce the volume of fertiliser used and therefore the concentration of nitrates discharging to the land and then to groundwater. So, in effect, the solar farm may well assist in improving water quality by replacing dairy farming with other types of primary production.

Clause 3.9(3) provides that SDC 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.

Clause (3)(a)

Productive capacity is defined as*: '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.'

The Applicant commissioned The AgriBusiness Group to undertake an assessment of the solar farm on highly productive land (**Appendix 16**). The assessment refers to both New Zealand and overseas studies that indicate that grass growth can be affected by solar panels, but the study carried out by Dr D Donaghy of Massey University does not accord with the experience to date in Canterbury with pasture under panels being as strong in growth as the pasture not under the panels as shown in the photos below. This may be due to both the quality of the land and the structure of the solar panels.

In June 2015, the Applicant established solar panels on the same site as the proposed Brookside Solar Array, and some on a site 200m away and some in Rakaia, Canterbury.

The photographs below show how well the grass grows beneath, between and around the panels, and whilst there are some bare patches (not unusual in an undulating paddock) there is no evidence of rills or channels caused by runoff.

Figure 4: Buckleys Road, Brookside (fixed system).

Figure 5: Hanmer Road, Brookside (fixed system)

Figure 6: Buckleys Road, Brookside tracking system after 9 years

The key possible reasons for these improved outcomes are outlined below.

- Reduced exposure to sun and extreme weather events.
- Soil moisture is enhanced, and temperature extremes are reduced.
- Ambient temperatures were improved.

Evidence from overseas has also shown that vegetable crops can be grown successfully in conjunction with solar including Tomatoes, Jalapenos, Kale and Chard and Broccoli. All reports from the USA quote the yield is similar or up to double the conventional yield and that water efficiency is improved significantly.

According to the National Renewable Energy Laboratory (NREL) in the USA, agricultural crops can thrive underneath the partial shaded conditions of solar installations, with panels creating the following environment for plants grown under or around the panels:

- reducing the amount of direct sunlight reaching the crops and reducing sunburn on crops
- creating cooler conditions during the day and warmer conditions at night
- reducing heat stress as well as reducing risks of frost damage
- extending growing seasons in multiple regions
- increasing soil moisture levels, which can lead to a reduction in irrigation needs.

The range of primary production activities that can be undertaken on the land will be reduced as it will not be possible, for example, to graze large animals amongst the panels or grow particular crops. However, it is possible to use it for some pastoral activities and high value horticultural activities (including utilising the shade provided by the panels) which are at the upper end of land uses in terms of the potential returns, employment, wellbeing and flow on economic impacts.

The other two criteria of legal constraints and the size and shape of existing and proposed land parcels are not relevant to this site.

Overall, the proposed land use of Agrisolar meets the requirements of the NPS-HPL in that it minimises the actual loss of any HPL and productive capacity and it allows for the land to support land- based primary production in the long term.

Clause (3)(a)

Clause (3)(b) seeks to avoid, if possible, or otherwise mitigate, any actual or potential reverse sensitivity effects on land-based primary production activities from the use of development.

The solar farm will not be sensitive to ploughing, harvesting and fertilising as Canterbury rain is sufficient to keep the panels clean and the proposed planting will also provide some dust mitigation from adjoining primary production activities. As such, it will not cause reverse sensitivity effects.

Is there any conflict between the NPS-HPL and NPS-REG and, if so, whether that conflict can be resolved?

The NPS-HPL does not directly conflict with the NPS-REG. The NPS-REG seeks to support the establishment and expansion of renewable energy generation, while recognizing the constraints of doing so. The NPS-HPL seeks to protect HPL from inappropriate uses and development. However, the NPS-HPL (clause 3.9(2)) provides a pathway for specified infrastructure (such as a solar farm) with an operational need to establish on a site that is HPL, in other words, such use and development of HPL is not inappropriate. As such, at a high level, there does not appear to be a conflict between the two NPS.

With regard to this Proposal, there is no requirement under the RMA for any particular NPS to take precedence over another. The NPS-HPL is obviously later in time and the regional and district councils have not had time to apply the NPS-HPL to the Canterbury region or the Selwyn District. As such, it is a matter of applying the NPS-HPL in a way that best reflects its relevance to this Proposal and the Selwyn District[1].

Overall, it is considered that the Proposal will not be contrary to the objectives and policies of the NPS-HPL.

7.4 Canterbury Regional Policy Statement

The Canterbury Regional Policy Statement (CRPS) gives an overview of the regional resource management issues facing the region. The ways in which the regional council wants to navigate these issues are set out in the underlying objectives, policies, and methods; with the overall goal to achieve integrated management of natural and physical resources across Canterbury.

The definition of ‘regionally significant infrastructure’ in the CRPS includes:

> *6. National, regional and local renewable electricity generation activities of any scale.*

Renewable electricity generation is defined as ‘*The generation of electricity from solar, wind, hydroelectricity, geothermal, biomass, tidal, wave, or ocean current energy sources*.’

[1] MfE https://environment.govt.nz/publications/understanding-national-direction/about-national-direction/: *Because an NPS does not state rules, there is room for local authorities to apply it in a way that best reflects its relevance to their region*.

Renewable electricity generation activities are defined as:

> '*The construction, operation and maintenance of structures associated with renewable electricity generation. This includes small and community-scale distributed generation activities, the system of electricity conveyance required to convey electricity to the distribution network and/or the national grid, and electricity storage technologies associated with renewable electricity*.'

The proposal is clearly defined as renewable electricity generation and therefore falls within the regionally significant infrastructure definition in the CRPS.

Chapter 5 of the CRPS addresses development in the wider region (outside of Greater Christchurch). The objectives seek to ensure the integration of land-use and regionally significant infrastructure including where it promotes sustainable management, which this proposal would by creating an energy generation facility that would serve the local community.

Policy 5.3.2 seeks to enable development including regionally significant infrastructure which does not compromise or foreclose options for accommodating the consolidated growth and development of existing urban areas; and the productivity of the region's soil resources, without regard to the need to make appropriate use of soil which is valued for existing or foreseeable future primary production, or through further fragmentation of rural land. It also seeks to avoid or mitigate natural and other hazards and reverse sensitivity effects and conflicts between incompatible activities whilst integrating with the efficient and effective provision, maintenance, or upgrade of infrastructure.

Policy 5.3.9 specifically seeks to provide for the development of new infrastructure, while:

a) *recognising the logistical, technical or operational constraints of this infrastructure and any need to locate activities where a natural or physical resource base exists;*

b) *avoiding any adverse effects on significant natural and physical resources and cultural values and where this is not practicable, remedying or mitigating them, and appropriately controlling other adverse effects on the environment; and*

c) *when determining any proposal within a sensitive environment (including any environment the subject of section 6 of the RMA), requiring that alternative sites, routes, methods and design of all components and associated structures are considered so that the proposal satisfies sections 5(2)(a) – (c) as fully as is practicable.*

Chapter 16 addresses Energy and seeks to promote a diverse and secure supply of energy. Objective 16.2.2 outlines the need to ensure a reliable and resilient generation and supply of energy for the region with a particular emphasis on renewable energy, which:

1. *provides for the appropriate use of the region's renewable resources to generate energy;*
2. *reduces dependency on fossil fuels;*
3. *improves the efficient end-use of energy;*
4. *minimises transmission losses;*
5. *is diverse in the location, type and scale of renewable energy development;*
6. *recognises the locational constraints in the development of renewable electricity generation activities; and*

7. *avoids any adverse effects on significant natural and physical resources and cultural values or where this is not practicable, remedies or mitigates; and*

8. *appropriately controls other adverse effects on the environment.*

Policy 16.3.2 specifically provides for small and community scale distributed renewable electricity generation which avoids, or where this is not practicable, remedies or mitigates any adverse effects on significant natural and physical resources or cultural values, and other adverse effects on the environment are appropriately controlled.

Policy 16.3.3 recognises the benefits of renewable energy generation facilities including maintaining or increasing electricity generation capacity while, amongst other matters, avoiding, reducing or displacing greenhouse gas emissions; maintaining or increasing the security of supply at local and regional levels, and also wider contributions beyond Canterbury; by diversifying the type and/or location of electricity generation; using renewable natural resources and assist in meeting international climate obligations.

Policy 16.3.5 seeks to provide efficient, reliable and resilient electricity generation within Canterbury by enabling the development of new electricity generation infrastructure, with a particular emphasis on encouraging the operation, maintenance and upgrade of renewable electricity generation activities and associated infrastructure.

The CRPS also addresses:

- Ecosystems and indigenous biodiversity (Chapter 9) that seeks to halt the decline in the quality and quantity of Canterbury's ecosystems and indigenous biodiversity and safeguard their life-supporting capacity and mauri.

Discussion

The potential adverse effects resulting from the proposed solar array will be avoided, remedied or mitigated as far as practicable. The proposal will contribute to the quantity of energy generated from renewable resources across the region, and the energy can be used close to where it is generated. Further, the proposal will increase the energy efficiency of the network as it will only result in an initial need to provide one new connection to the Orion distribution network. The full-scale solar farm may require upgrades to the existing Orion infrastructure, however, these activities sit outside the scope of this proposal and will be dealt with as the need arises at a later date.

The proposed solar farm will not affect any urban areas. Regarding the use of rural land, the land will still be used for primary production as sheep will initially graze between and under the solar panels. The Site is not affected by natural hazards (in the operative District Plan) as it lies outside the ECan defined flood zone. Reverse sensitivity effects and conflicts between incompatible activities can be avoided given the rural character, existing and proposed planting and land uses in the surrounding area.

It is considered that the proposal will not be contrary to the infrastructure and energy objectives and policies of the CRPS, and in fact, will accord with those seeking to achieve increased renewable electricity generation.

7.5 Operative Selwyn District Plan

Natural Resources

The Selwyn District Plan contains a number of objectives and policies that address soils, vegetation and ecosystems, water and outstanding natural features and landscapes. These are set out in full in **Appendix 11**.

Of relevance to this proposal, the Plan seeks to retain soil structure and minimise soil erosion to enable future use for primary production. This proposal will require minimal earthworks and the soils over the majority of the Site will not be disturbed, enabling the use of the land for sheep grazing. Furthermore, if the solar panels were to be removed in the future, the structure of the soil would be intact and able to be used for a range of primary production activities.

The Plan seeks to protect areas of significant areas of indigenous vegetation and habitats of indigenous fauna and encourage the enhancement of areas of indigenous vegetation, whilst avoiding, remedying or mitigating adverse effects on indigenous ecosystems, vegetation and habitats. It is understood that the Site is a highly modified area that is intensively farmed. It contains generally negligible ecological values in terms of vegetation and habitats, although it likely supports widespread and common indigenous bird species. The Site may on occasion provide habitat for a small number of bird species of High ecological value, but adjacent and extensive similar habitat is available in the surrounding area and in areas between solar panel arrays. Overall, the level of effect of the construction and operation of the proposed solar farm on ecological values is expected to be negligible.

In terms of water, the Plan seeks to avoid and/or mitigate contamination of groundwater and surface water. In this instance, earthworks are proposed that may penetrate groundwater. However, it is proposed to ensure earthworks are located at least 10m from the water race adjacent to Branch Drain Road to prevent contaminants from entering surface water, and in turn, groundwater. Further, an Erosion and Sediment Control Plan will be implemented to protect water quality by ensuring that risk of sedimentation of water is reduced as much as possible.

Overall, the proposal willnot be contrary to the objectives and policies that deal with natural resources in the District.

Physical Resources

The objectives and policies relating to transport seek to ensure the safe and efficient operation of the District's roads by managing the effects of activities. This is achieved by ensuring that all sites have legal access to a legal road which is formed to the standard necessary to meet the needs of the activity, vehicle crossings are designed and positioned to ensure good visibility for all road users and buildings are set back a sufficient distance from road boundaries.

The vehicle access and crossing to the Site is already formed but will need to be upgraded to a standard that enables trucks to access the Site. There are good sightlines from the access point given the flat topography and linear nature of the road. It is also noted that once constructed, the number of vehicles entering and exiting the Site will be low and infrequent. Vehicle movements will generally occur during a period of 12 months whilst construction of the solar array is completed. Therefore, overall, it is considered that the proposal will not have long term effects on the safe and efficient operate of the surrounding road network.

In terms of utilities, the Plan seeks to recognise that utilities are essential tools for people's economic and social well-being, and that the environmental effects of providing for these are managed. Of particular relevance, utility structures should not be located in Wāhi Taonga Sites and Management Areas, unless operational necessity makes this impractical. Utility structures should be made of low reflective materials, and their provision enabled in rural areas if they serve extensive areas, commensurate with operational requirements.

It is proposed to locate a large solar array in a rural location to ensure maximum access to sunlight, ease of connection to the local grid via the sub-station to the northwest of the Site and enable dual use of the Site for pastoral activities. It is proposed to avoid the Wāhi Taonga Management Site – C59 site partly located within the southern portion of the Site by placing a 50m exclusion buffer around it. The panels are designed to be efficient, and this requires them to have low reflectivity, meaning that surrounding properties and roads will not be adversely affected by glare.

Overall, the proposal will not be contrary to the objectives and policies that deal with physical resources in the District.

People's Health, Safety and Values

This set of objectives and policies manages cultural matters and the quality of the environment. The Plan seeks to protect sites identified as Wāhi Taonga Sites, Wāhi Taonga Management Areas including by fostering a partnership between landholders and local Rūnanga. The applicant has agreed with Te Taumutu Rūnanga to place a 50m exclusion buffer around the identified cultural site. No earthworks will be undertaken, and no panels will be constructed in this location.

The quality of the environment is sought to be retained by maintaining rural character and avoiding reverse sensitivity effects but recognising that a variety of activities occur in the rural area. Significant adverse effects on the amenity values of the rural area should be avoided, remedied or mitigated by maintaining low levels of building density and a predominance of vegetation cover; avoiding highly reflective utility structures, recognising temporary noise associated with short-term, seasonal activities, mitigating nuisance effects on adjoining dwellings caused by dust from earthworks, or stockpiled material and ensuring buildings are setback a sufficient distance from property boundaries.

The LVEA states that the Site possesses a distinctive rural character which is sensitive to changes in character and land use. The rural amenity values that relate to the Site include the following:

- Expansive areas of open pasture which creates a sense of spaciousness and openness;
- There is a general lack of structures and buildings, aside from the pivot irrigators and two dwellings; and
- A distinct linearity, provided by established shelter belts and fenced paddocks.

It is considered that the Proposal will have a very localised low-moderate adverse effects on the rural character values and amenity of the Site. As the proposed mitigation planting establishes along the Site boundary to a height of approximately 3.5m, the adverse effects on the landscape are expected to reduce to low (adverse).

Earthworks will be managed in accordance with an Erosion and Sediment Control Plan to minimise the risk of dust entering adjoining properties and ensuring any stockpiles will be

located away from property boundaries. However, the Site will retain existing planting along the site boundaries as well as proposing to establish a 3m wide landscape buffer where there is currently no planting. Also, grass (or crops) will be maintained beneath and between the panels to enable the Site to be used for primary production. Noise will be generated during the construction phase. That said, it is recognised that the works are temporary, and the scheduling of piling works will be discussed and agreed with adjoining property owners/occupiers and addressed in the NMP. Once operational, the Site will meet the operative district plan noise limits.

This proposal introduces a scale of built development that could be considered out of character, and the site plans certainty suggest a dense form of development. However, there will be 4 metres between the rows of panels and the panels, whilst shading the ground, do not sit upon it. As such, when viewed from different angles, the density of the panels can change, with spaces between rows providing visual relief from the 'built form'. Furthermore, there will be grazing or some form of primary production occurring between and under the panels. Whilst the built density is greater than that generally anticipated, the retention of primary production and the proposed planting will mitigate the impact of this potential effect on rural character and visual amenity.

Overall, the proposal will not be contrary to the objectives and policies that deal with people's health, safety, and values in the Selwyn District.

In summary, the proposal will not be contrary to the objectives and policies in the Selwyn District Plan as it seeks to provide for a renewable energy generation facility that requires a large site in proximity to existing electricity transmission infrastructure. The rural character of the area will be maintained by the proposed landscaping and on-going use of the Site for primary production,

7.6 Proposed Selwyn District Plan

Strategic Directions

The Strategic Directions seek to provide for the infrastructure needs of the community and protect their operation. Whilst also enabling the development, upgrade, maintenance, and operation of all-important infrastructure in a way that minimises adverse effects and has regard to the practical constraints and the logistical and technical practicalities. However, the risk from natural hazards to important infrastructure should not be increased, other than where necessary to provide for important infrastructure that has no reasonable alternative.

The relevant objective seeks to strengthen the partnership between the Council and Ngāi Tahu by, amongst other matters, promoting active and meaningful participation by those who hold mana whenua in the resource management decision-making process.

The proposal will be generally consistent with the strategic directions as it is intended to provide for important infrastructure (a solar array), recognising the need for a large site, access to sunlight and a relatively high density of built development. However, the Site lies in the Plains FMA but as the panels are located between 3 metres and 500mm above the ground, they are unlikely to increase flood risk. Also, as noted above, the applicant has agreed with Te Taumutu Rūnanga to place a 50m fenced exclusion buffer around the identified cultural site within which no earthworks will be undertaken, or solar panels constructed. It is considered that the 50m buffer area will ensure that the risk of adverse effects on the Wāhi Taonga Management Site – C59 are minimised. It is also proposed to implement an Accidental Discovery Protocol across the Site in case any unexpected artefacts are encountered during the works.

Energy and Infrastructure

There is very clear direction in the Proposed Plan to increase renewable electricity generation output for national, regional, and local use while mitigating adverse effects on the environment and sensitive activities. The adverse effects of renewable electricity generation on the physical and natural environment should be managed to minimise effects on the amenity values of the surrounding environment, public access and the health and safety of people. However, the presence and effects of development within areas of significance to Māori should be limited and effects minimised.

Policy EI-P9 specifically provides for renewable electricity generation and renewable electricity generation activities across the District, while having particular regard to:

1. *The potential benefits of the proposed activity, particularly contributions to national energy objectives or renewable electricity generation targets;*
2. *The technical and operational requirements of renewable electricity generation and renewable electricity generation activities;*
3. *The availability of renewable electricity generation sources;*
4. *The location and efficient use of existing electricity generation and distribution infrastructure;*
5. *The potential to provide an affordable, self-sufficient source of electricity to individuals and small communities.*

This proposal will enable the establishment and operation of a large-scale solar array that will directly contribute to renewable electricity generation targets by reducing reliance on non-renewables and extensive transmission networks. This solar array will generate electricity that can flow into the local network and be used locally, rather than needing to be transported over long distances. The Site is located within proximity of several population centres including Christchurch, Leeston, Lincoln and Rolleston. It is proposed to retain the rural character of the Site by undertaking primary production activities and planting exotic species along the boundaries of the Site. Earthworks will be managed by way of an Erosion and Sediment Control Plan.

As stated above, the applicant has agreed with Te Taumutu Rūnanga to place a 50m fenced exclusion buffer around the identified cultural site within which no earthworks will be undertaken, or solar panels constructed. It is considered that the 50m buffer area will ensure that the risk of adverse effects on the Wāhi Taonga Management Site – C59 are minimised. It is also proposed to implement an Accidental Discovery Protocol across the Site in case any unexpected artefacts are encountered during the works.

Transport

The objectives and policies seek to protect land transport corridors and land transport infrastructure from incompatible land use activities, and manage vehicle access, vehicle crossings and manoeuvring areas to maintain the safe and efficient operation of land transport corridors and land transport infrastructure.

The access point and vehicle crossing to the Site will be upgraded to a standard that enables trucks to access the Site. It is also proposed to create an informal parking area for ten vehicles within the Site. The Site is also very large and therefore, there will be no need for vehicles to

reverse onto the adjoining roads. In fact, except during operation, the Site will generate very little traffic as there is no need to staff or access the Site other than for occasional visits.

Natural Hazards

New development, other than new important infrastructure, should be avoided in areas where the risks from natural hazards to people, property and infrastructure are assessed as being unacceptable; and in all other areas, is undertaken in a manner that ensures that the risks of natural hazards to people, property and infrastructure are appropriately mitigated.

Earthworks in the Plains Flood Management Overlay should be managed to ensure that they do not exacerbate flooding on any other property by displacing or diverting floodwater on surrounding land.

The proposal will not be located in a high hazard area but will be located in the following flood areas:

Stages	**200-year ARI rainfall flood depth (m)** **(maximum)**	**200-year ARI Selwyn River flood depth (m) (maximum)**
A/1	0.2m -1m	N/A
A/2	0.2m – 0.5m	N/A
A/3	0.2m -1m	N/A
	500-year ARI rainfall flood depth (m) (maximum)	**500-year ARI Selwyn River flood depth (m) (maximum)**
B/1	Up to 1m	N/A
B/2	Up to 1m	Less than 0.2m
B/3	Up to 1m	Less than 0.2m
	500-year ARI rainfall – max depth x velocity (m) (maximum)	**500-year ARI rainfall – max depth x velocity (m) (maximum)**
C/1	Less than 0.8m	N/A
C/2	Less than 0.8m	Less than 0.8m
C/3	Less than 0.8m	Less than 0.8m

The proposed earthworks are of such a scale as to not exacerbate flooding on any other property or affect overland flow paths. The proposed solar array is not defined as ‘important

infrastructure' but it is considered that the risks from natural hazards are not unacceptable. The panels will be between 3. and 0.5m above ground level, and therefore generally above the anticipated flood levels. During disasters the panels can be moved into a stow position at 1.8m above the ground, keeping them above the 200-500 year flood levels, on top of this the panels are sealed from the outside environment and can get wet. Furthermore, the inverters and batteries will sit on steel skids, which will be mounted on either piles (steel or concrete) or a concrete slab. This means that they will be 1m above the ground and consequently above the 200-year and 500-year rainfall ARI and the 500-year ARI Selwyn River flood depth. This was not clearly stated in the application but was considered as part of the Landscape Assessment. However, the buildings/structures will certainly not exceed the permitted 12m height limit.

It has been assumed that the flood depths and velocities in the Proposed Plan have taken into consideration climate change.

The proposed earthworks will be very minimal in extent and depth, with all trenching being filled to existing ground level and therefore they will not exacerbate flooding on any other property by displacing or diverting floodwater.Ecosystems and Indigenous Biodiversity

The intent of the objectives and policies are to protect areas of significant indigenous vegetation and significant habitats of indigenous fauna to ensure no net loss of indigenous biodiversity and maintain and enhance other indigenous biodiversity values. The restoration and enhancement of areas of indigenous biodiversity is encouraged and supported, and the relationship of Ngāi Tahu whānui, and their customs and traditions, with indigenous biodiversity is recognised and provided for. The policies also seek to avoid planting pest tree and plant species that would affect indigenous biodiversity values.

It is understood that the Site is a highly modified area that is intensively cultivated. It contains generally negligible ecological values in terms of vegetation and habitats, although it likely supports widespread and common indigenous bird species. The Site may on occasion provide habitat for a small number of bird species of High ecological value, but adjacent and extensive similar habitat is available in the surrounding area and in areas between solar panels. However, it is proposed to protect the habitat of the Canterbury Mudfish in the water races surrounding the Site. Therefore, it is considered that the proposal will not be contrary to these provisions.

Earthworks

The Plan seeks to manage earthworks to limit adverse effects on the surrounding environment such as adverse visual amenity, sediment, and nuisance effects, and erosion, inundation or siltation that can impede the functioning of natural biological and physical processes. The policies also seek that once completed, earthworks do not result in any visual impact, loss of privacy, dust nuisance, and shading.

The earthworks will be minimal given the scale of the Site, being limited to direct pile driving, trenching for the cables to support the solar array, and clearing grass to provide a clear surface for Site Office and storage facilities. The potential effects of the earthworks will be managed by an Erosion and Sediment Control Plan to minimise the risk of sediment runoff and a Dust Management Plan to minimise the risk of dust entering adjoining properties. The overall topography of the Site will not be altered and once complete, the earthworks will not result in any loss of privacy or shading effects because of increased ground levels.

Noise

The objectives and policies seek that people, and the environment are protected from significant levels of noise. The provisions seek to do this by setting maximum noise limits to reflect the character and amenity of each zone and limits on the location, frequency, and duration of specific activities that generate noise.

The proposal will likely generate noise during the construction phases; however, these effects will generally be managed in accordance with NZS 6803: Construction Noise ensuring construction only happens during daylight hours during the week as outlined above. However, a Noise Management Plan will be prepared which will include measures such as discussing and agreeing the scheduling of piling works with the owner/occupier.

Once operational, the Site will operate within the Proposed District Plan noise limits due to the passive nature of, and lack of moving machinery associated with a solar array.

General Rural Zone

The Plan provides for development that supports, maintains, or enhances the function and form, character, and amenity values of rural areas; prioritises primary production and retains a contrast in character to urban areas. The character of the rural area is derived from an overall low overall building density, and predominance of vegetation cover; primary production and retaining a clear delineation and contrast between the district's rural areas and urban areas, including Christchurch City. However, the Rural Zone is recognised as supporting economic development and a range of activities are enabled, if they:

- have a direct relationship with, or are dependent on, primary production;
- have a functional or operational need to locate in the rural area;
- represent an efficient use of natural and physical resources; and
- maintain or enhance the character and amenity values of the surrounding area.

Furthermore, reverse sensitivity effects on lawfully established primary production activities should be avoided.

It is proposed to locate a large solar array in a rural location to ensure maximum access to sunlight, ease of connection to the local grid via the Orion Substation to the north-west of the Site and enable dual use of the Site for primary production activities. Thus, the solar array has a direct relationship with primary production, meaning that the Site will be used very efficiently. It will not generate reverse sensitivity effects on adjoining established primary production activities as it will not be sensitive to noise or general farming activities such as ploughing, harvesting and fertilising. In addition, the Site meets anoperational need to locate a solar farm on a large site, flat, suitable ground and open and close to a substation for distributing the power.

As discussed above, the LVEA states that the Proposal will have at worst, a very localised low-moderate adverse effect on the rural character values and amenity of the Site, reducing to low (adverse) as the mitigation planting becomes established. Existing site boundary shelterbelts and landscaping will be retained, and gaps will be planted or where there is no boundary planting, a 3m wide or a double staggered row of exotic shelterbelt species will be planted to provide sufficient screening of the Proposal. Furthermore, an additional shelterbelt will be planted along the boundary with 324 Branch Drain Road.

Vegetation will also be maintained beneath and between the panels as the Site will be used for primary production. However, as discussed above, the proposal introduces a scale of built development that could be considered out of character, but whilst the built density is greater than likely anticipated, the retention of primary production and the proposed planting will mitigate the impact of this potential effect on rural character and visual amenity.

In summary, the proposal will not be contrary to the objectives and policies in the PSDP as it seeks to provide for a renewable energy generation facility that requires a large site in proximity to existing electricity transmission infrastructure. The rural character of the area will be maintained by the proposed landscaping and primary production.

7.7 Mahaanui Iwi Management Plan 2013

The Mahaanui Iwi Management Plan 2013 (MIMP) is the manawhenua planning document reflecting the collective efforts of six Papatipu Rūnanga that represent the hapū who hold manawhenua rights over lands and waters within the takiwā from the Hurunui River to the Hakatere River and inland to Kā Tiritiri o Te Moana. The Site is within the Papatipu Rūnanga of Te Taumutu.

The MIMP provides a values-based, plain language policy framework for the protection and enhancement of Ngāi Tahu values, and for achieving outcomes that provide for the relationship of Ngāi Tahu with natural resources. The plan has the mandate of the six Papatipu Rūnanga, and is endorsed by Te Rūnanga o Ngāi Tahu, as the iwi authority.

The MIMP specifically addresses solar electricity generation in the MIMP, stated in Issue P17 that Ngai Tahu have a particular interest in the generation, distribution and use of energy, and in particular support in principle the use of solar energy generation in the region (Policy 17.5).

The MIMP outlines that wāhi taonga sites are to be identified, protected, and managed (Issue CL3). Where there is considered to be low risk to sites, Policy CL3.8 seeks to ensure that the Accidental Discovery Protocol is implemented to mitigate the risk that artefacts may encountered during soil disturbance activities.

Overall, the proposal will not be contrary to the framework, objectives and policies set out in the MIMP. It is proposed to soften the appearance of the Site by retaining existing site boundary shelterbelts and landscaping where appropriate. For the remainder of the site boundaries, gaps will be planted or where there is no boundary planting, a 3m wide double staggered row of exotic shelterbelt species will be planted to provide sufficient screening of the proposal.

Further, although no works are proposed within the wāhi taonga site, it is proposed to implement an Accidental Discovery Protocol on the Site to ensure that steps can be put in place if any accidental discoveries are made during construction works.

7.8 Conclusion on Statutory Considerations

Overall, the proposal will meet the intent of the objectives and policies contained within the CRPS, OSDP, PSDP and MIMP. Whilst it is proposed to convert the land for use as a utility, the proposal will remain in keeping with the productive land uses with primary production proposed underneath and around the solar frames.

8.0 Part 2 of the RMA

In R J Davidson the Court of Appeal determined that:

(a) RMA decision makers should usually consider Part 2 when making decisions on resource consents (that is, the implication of the words "subject to Part 2" in section 104, RMA).

(b) However, where the relevant plan provisions have clearly given effect to Part 2, there may be no need to do so as it "would not add anything to the evaluative exercise". It would be inconsistent with the scheme of the RMA to override those plan provisions through recourse to Part 2. In other words, "genuine consideration and application of relevant plan considerations may leave little room for Part 2 to influence the outcome".

The CRPS, CLWRP and the OSDP are the mechanism by which Part 2 is given effect to by Council. It is considered that all these documents were competently prepared through an independent hearing and decision-making process in a manner that appropriately reflects the provisions of ss 5-8 of the Act. Accordingly, no further assessment against Part 2 is considered necessary.

9.0 Consultation

9.1 Neighbouring Properties

KeaX has discussed the proposal with the owners and/or occupiers of the following properties:

- 115 Buckleys Road.
- 821 Hanmer Road.
- 883 Hanmer Road.
- 105 Buckleys Road.
- 150 Buckleys Road.
- 187 Buckleys Road.

9.2 Rūnanga

KeaX has contacted Te Taumutu Rūnanga, both directly and via MKT, with details of the proposal and sought to ascertain further information regarding the Wāhi Taonga Management Site – C59. They have provided a written response to the proposal as discussed above in section 6.4.

9.3 Selwyn District Council

A pre-application meeting was held by the applicant with Selwyn District Council staff on 31st May 2023. Key aspects discussed included proposed landscaping, traffic access, and the National Policy Statement on Highly Productive land. This discussion has influenced some aspects of design and the consenting approach.

9.4 Other Agencies

KeaX has approached Orion, the electricity network provider responsible for ensuring the distribution of power to more than 211,000 households across central Canterbury. Orion also own and operate the substation situated at the north-western corner of the site. In discussions between KeaX and Orion, Orion have expressed their support for the development and KeaX intends to work closely with Orion across the life of the project.

ECan has also been approached and have granted a consent for earthworks and the discharge of operational stormwater from the solar farm.

10.0 Notification

10.1 Public Notification

The Application has been assessed against each of the steps under section 95A and section 95B to determine whether public or limited notification is required. This assessment is outlined below.

Section 95A provides a step-by-step guide in determining whether public notification is required:

Step 1	*Mandatory public notification in certain circumstances.* *An application must be publicly notified if:* • *the applicant requests public notification* • *public notification is required under section 95C* • *the application is made jointly with an application to exchange recreation reserve land* None of the circumstances above apply to this application.
Step 2	*If not required by step 1, public notification is precluded in certain circumstances.* *An application cannot be publicly notified if:* • *a rule or national environmental standard (NES) precludes notification* • *the application is for one or more of the following, but no other, activities:* - *a controlled activity* - *a restricted-discretionary or discretionary application for:* • *a subdivision of land* • *a residential activity (defined in new section 95A(6))* - *a boundary activity (defined in section 87AAB;* - *an activity prescribed in regulations.* Notification is not precluded by any provisions in a rule or NES. None of the other provisions within this step are applicable to this application.
Step 3	*If not precluded by step 2, public notification is required in certain circumstances.* *Other than for those activities in step 2, public notification is required if:* • *a rule or NES requires public notification* • *the assessment under section 95D determines that the activity will have, or is likely to have, adverse effects on the environment that are more than minor.* Public notification is not required by any rule or NES. As concluded above the effects of this proposal will be no more than minor.
Step 4	*Public notification in special circumstances* *If notification is precluded under step 2, or isn't required under step 3, consideration must be given to whether special circumstances exist that warrant public notification of the application.* There are no special circumstances that result in public notification under Step 4.

Public notification under section 95A is precluded in this application because:

a) None of the circumstances of Step 1 (section 95A(3)) exist;

b) None of the circumstances of Step 2 apply;

c) None of the circumstances in Step 3 apply because: The adverse effects on the environment will be minor (at worst) (as assessed above), and there are no NES or rules in the District Plan which require the public notification of the application;

d) Step 4 does not apply as there are no special circumstances which could warrant public notification under s95A(9)

Accordingly, the council must not publicly notify this application.

10.2 Limited Notification

Where the consent authority accepts that public notification is not required (see Part 11.1 above), the consent authority must determine if limited notification is required under section 95B:

Step 1	*Certain affected groups and affected persons must be notified.* *If the consent authority determines that certain people or groups are affected, these persons/groups must be given limited notification:* • *affected protected customary rights groups* • *affected customary marine title groups (in the case of an application for a resource consent for an accommodated activity)* • *an affected person under section 95E to whom a statutory acknowledgement is made (if the proposed activity is on or adjacent to, or may affect, land that is the subject of a statutory acknowledgement)* None of the circumstances, set out above, apply.
Step 2	*If not required by step 1, limited notification is precluded in certain circumstances. An application cannot be limited notified if:* • *a rule or NES precludes limited notification of the application* • *it is for either or both of the following, but no other, activities:* - *a controlled land use activity under a district plan* - *an activity prescribed through regulations.* There are no provisions in the CLWRP, OSDP or PSDP that preclude notification.
Step 3	*If not precluded by step 2, certain other affected persons must be notified.* *Determine whether, in accordance with section 95E, the following persons are affected persons:* • *in the case of a boundary activity, an owner of an allotment with an infringed boundary; and* • *in the case of any activity prescribed under section 360H(1)(b), a prescribed person in respect of the proposed activity.* *In the case of any other activity, determine whether a person is an affected person in accordance with section 95E.* Step 3 does not apply as there will be no minor or more than minor adverse effects on persons as set out in the effects assessment above.

Step 4	*Further notification in special circumstances.* *If the consent authority determines special circumstances exist that warrant limited notification of the application to any other persons not already determined to be eligible for limited notification (excluding persons assessed under section 95E as not being affected persons), the council must give limited notification to those persons.* Step 4 does not apply as there are no special circumstances which would warrant limited notification under Section 95B(10) to persons other than those considered as affected persons under section 95E.

With regard to affected persons, Section 95E states:

> *95E Consent authority decides if person is affected person*
>
> *(1) For the purpose of giving limited notification of an application for a resource consent for an activity to a person under section 95B(4) and (9) (as applicable), 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). …*
>
> *(3) A person is not an affected person in relation to an application for a resource consent for an activity if—*
>
> *(a) the person has given, and not withdrawn, approval for the proposed activity in a written notice received by the consent authority before the authority has decided whether there are any affected persons; or*
>
> *(b) the consent authority is satisfied that it is unreasonable in the circumstances for the applicant to seek the person's written approval.*
>
> *(4) Subsection (3) prevails over subsection (1).*

Under Section 95E(1), a person must only be considered to be affected if an activity's effects on them will be minor or more than minor (rather than may be or could be minor or more than minor).

Mitigation measures and any conditions proposed should be taken into account when assessing effects at the Section 95 stage given that these reflect the reality of what the adverse effects on the environment would be. This has been affirmed by the Court of Appeal.

Whilst mitigation measures may be further refined at the substantive Section 104 stage, the mitigation measures proposed in the application (as lodged and at notification stage) define the scope of the application. Therefore, adjoining property owners can only become less (rather than more) affected at the Section 104 stage.

The assessment of environmental effects has determined that adverse effects on owners/occupiers will be less than minor for landscape and visual effects, glint and glare effects and construction noise.

KeaX has sought written approvals from the following persons/ parties, which are included in **Appendix 17**:

Address	Owners/occupiers	Written approval obtained
105 Buckleys Road	**Owners/Occupiers**: Paul and Jenny Ward.	Obtained.
150 Buckleys Road, Leeston (part of the Site).	**Owners/Occupiers:** Matthew and Priscilla Ward.	Obtained.
115 Buckleys Road (dwelling located outside development area).	**Occupiers** Darren Osborne and Danica Williams.	Obtained.
187 Buckleys Road, Leeston (part of the Site).	**Owners/Occupiers**: Angela Marie Ward and Pitcairn Trustees Limited (Michael Loy).	Obtained.
883 Hanmer Road, Leeston (adjoining site).	**Owner:** Keith and Marilyn Price. **Occupier:** David Duncan and Raye Packer.	Obtained.
821 Hanmer Road, Leeston (adjoining site).	**Owners/occupiers:** Kim and Shane Price. Keith and Marilyn Price.	Obtained.

Therefore, the Councils must not have regard to effects on those 'persons' who have provided their written approval.

Accordingly, Selwyn District Council need not give notice of this Proposal to any persons.

10.3 Conclusion of Notification Assessment

This application has been assessed against each of the steps under section 95A to determine whether public notification is required. None of the steps are applicable in this instance to warrant public notification. In particular, the activity will not have adverse effects on the environment that are more than minor in accordance with section 95D.The application has been assessed against each of the steps under section 95B to determine whether limited notification is required.

There are no special circumstances that exist which would otherwise warrant public notification, or limited notification to other persons, of this application. The assessment of environmental effects has determined that adverse effects on owners/occupiers will be less than minor, therefore the consent authority need not give notice of this Proposal to any person.

11.0 Conclusion

KeaX seeks consent to construct a new solar array (or solar farm) on a 111ha site in the Brookside area, approximately 10km north of Leeston in mid-Canterbury. The solar array will be comprised of a total of 140,000 solar panels, with the solar panels situated between 500mm and

3m above ground level. Once operational the solar array will be capable of generating up to approximately 100GWh (50MW AC / 75MW DC)160 MW of renewable electricity, to be fed back into the electricity network via the Brookside Substation located in the north-western corner of the site.

Resource consent is required under the operative Selwyn District Plan as a discretionary activity, as the solar array will generate electricity that will not be used on-site, seeks the retention of relocatable buildings on the site beyond the construction phase of the project (i.e. on a long-term basis to be used as a staff room and storage).

A range of expert reports have been prepared to assess the potential environmental effects of the proposed expansion. The environmental effects assessed are summarised as follows:

- Ecological Effects

Based on the desktop findings as set out in the Ecology Memo, it is considered that the Site does not meet any of the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity, as listed in Appendix 3 of the Canterbury Regional Policy Statement (CRPS). As such, the Site is not significant in terms of the CRPS. Drains that surround the Site that support Canterbury mudfish are significant in terms of the CRPS.

Based on the conclusions of the ecological assessment, outlined above and in **Appendix 12,** the level of effect of the construction and operation of the proposed solar farm on ecological values is expected to be very low, constituting a less than minor adverse effect.

- Visual Amenity and Landscape Effects

The removal of all internal vegetation will have a temporary adverse effect resulting in less than minor effects (low). Once the landscape buffer planting is fully established along the open Site boundaries, effects on the physical landscape are essentially neutralised.

The proposed solar panels will have a low profile in the context of the flat topography and the surrounding vegetation and are not expected to be a prominent feature in the landscape.

It is proposed to undertake all mitigation planting before construction starts, so it grows and establishes along the Site boundaries, meaning that there will be plant growth prior to construction commencing.

As the proposed mitigation planting establishes along the Site boundary to a height of approximately 3.5m, the adverse effects on rural character will become less than minor.

From public locations, adverse visual effects will be at worst minor (with mitigation) reducing to less than minor over time.

From private locations, adverse visual effects will be less than minor to neutral depending on the viewing distance to the Site, intervening vegetation and nature of the view.

- Cultural Effects

The applicant has agreed with Te Taumutu Rūnanga place a 50m fenced exclusion buffer around the identified cultural site within which no earthworks will be undertaken, or solar panels constructed. It is considered that the 50m buffer area will ensure that the risk of adverse effects on the Wāhi Taonga Management Site – C59 are minimised.

Overall, it is considered that potential adverse effects on the cultural values of the Site will be less than minor.

- Construction Effects

The earthworks and construction activities will be managed by way of an ESCP and dust management plan.

- Earthworks

To construct the solar array, earthworks are proposed to a maximum volume of 7,020.5m³ and a maximum trench depth of 1m, with piles being driven to 1.8m into the ground, where the highest recorded groundwater level in the vicinity of the Site is 0.22m below ground level. However, groundwater encountered during recent geotechnical investigations was 2-3m below ground level.

Taking into account:

- the separation distance between the earthworks and site boundaries and the water races, and
- that works will proceed in accordance with the Erosion and Sediment Control Plan, and
- the use of gravel on the internal tracks to manage dust and the creation of muddy areas.
- the 50m buffer around the Wāhi Taonga Management Site – C59.

it is considered that the effects of the proposed earthworks on the amenity of the surrounding area and groundwater quality can be effectively managed.

- Operational Effects

Once the solar array is operational, the traffic generated by the proposal will likely be approximately four vehicle trips per month when staff visit the site to check the solar array is operating as it should and carry out any maintenance.

Noise generated by the solar array will meet the operative district plan noise limits as shown on the attached noise report.

Traffic noise may be noticeable, with vehicles travelling to and from the Site, however such noise is commensurate with other activities in the area and indeed to a lesser degree than the current dairy farming activity onsite.

Primary production activities are proposed across the Site which will maintain an element of rural character and amenity on the Site.

- Positive Effects

The proposal will assist in meeting national targets in increasing electricity generation from renewable energy and reducing reliance on non-renewables. Furthermore, this electricity will be generated in proximity to large populations including Rolleston, Lincoln, and Christchurch, thus reducing the need for long transmission distances.

An additional benefit is the ability to use the Site for two purposes: primary production and the generation of renewable electricity.

This proposal will assist in reducing greenhouse gas emissions by reducing reliance on fossil fuels. It will also build resilience into the electricity generation network by reducing reliance on hydro electricity generation, which is under pressure due to changes in weather patterns that may be related to climate change.

Furthermore, it will provide a locally generated, resilient electricity supply; reducing the need for long transmission distances and the costs associated with that. It may also assist with lowering the risk of unreliable supply due to issues such as earthquakes that can disrupt supply.

An assessment of the relevant objective and policy provisions in the NPS-REG, NPS-HPL, CRPS, MIMP, the OSDP and the PSDP has been undertaken.

The NPS-REG provides for the development, operation, maintenance, and upgrading of new and existing renewable electricity generation activities, such that the proportion of New Zealand's electricity generated from renewable energy sources increases to a level that meets or exceeds the New Zealand Government's national target for renewable electricity generation.

The CRPS gives an overview of the regional resource management issues facing the region. The ways in which the regional council wants to navigate these issues are set out in the underlying objectives, policies, and methods; with the overall goal to achieve integrated management of natural and physical resources across Canterbury.

The MIMP is the manawhenua planning document reflecting the collective efforts of six Papatipu Rūnanga that represent the hapū who hold manawhenua rights over lands and waters within the takiwā from the Hurunui River to the Hakatere River and inland to Kā Tiritiri o Te Moana. The Site is within the Papatipu Rūnanga of Te Taumutu. The MIMP specifically addresses solar electricity generation in the MIMP, stated in Issue P17 that Ngai Tahu have a particular interest in the generation, distribution and use of energy, and in particular support in principle the use of solar energy generation in the region (Policy 17.5).

The OSDP and PSDP contain objectives and policies that manage soil and land, water, outstanding natural features and landscapes, quality of the environment, noise and vibration, dust and reverse sensitivity. The focus being on the management of natural and physical resources whilst providing for economic activities and people's health and wellbeing.

Overall, it is considered that the proposed solar array will generally be consistent with the direction of the objectives and policies in the identified statutory planning documents as set out above and, that granting of this land use consent would give effect to Part 2 of the Act.

The application must be processed on a non-notified basis as adverse effects on all properties have been assessed as less than minor and the proposal will generate adverse effects that could be reasonably contemplated in the Rural-Outer Plains Zone, taking into account the proposed mitigation measures, including the proposed conditions of consent.

It is considered that no special circumstances exist.

In conclusion, it is considered that the Selwyn District Council has the authority to grant consent to the proposed development on a non-notified basis in terms of Sections 104 and 104B of the RMA for the reasons stated above.