

Greytown Solar Farm - Expert Statement on the Effects on Soil

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Prepared For: Far North Solar Farm Limited

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WAITARA SOLAR FARM - EXPERT STATEMENT ON HIGHLY PRODUCTIVE LAND

Introduction

Qualifications and experience

1. My name is Ian Hanmore. I am the Director of Hanmore Land Management Limited, a company specialising in land management and environmental consultancy. Prior to this I contracted my service through AgFirst Northland. I provide services to a range of private clients, planners, Regional and District Councils, and Māori Trusts throughout New Zealand, with a particular focus on the Waikato, Auckland, and Northland regions.
2. I hold a Master of Applied Science majoring in Natural Resource Management from Massey University, I am an approved competent mapper for the National Environmental Standards for Plantation Forestry Erosion Susceptible Classification with MPI, I have an Advanced Nutrient Management Certificate from Massey University and am a member of the New Zealand Association of Resource Managers, the New Zealand Institute of Primary Management and the New Zealand Society of Soil Science.
3. I have been a consultant in the above capacity for 17 years and have worked extensively throughout the North Island. As part of my work I carry out soil and land use capability (LUC) mapping. This work involves detailed soil and LUC surveys to map soils suitable for horticultural and specific horticultural crops, to identify prime, elite, high class and highly versatile soils and highly productive land. This work is used in regard to subdivisions and land use consents, assisting farmers matching their production policy to their land resource, identifying land use development opportunities and enterprise diversification.

THE IMPACTS OF A PROPOSED SOLAR FARM ON HIGHLY PRODUCTIVE LAND

Background

A proposed solar farm is to be located at 415 Moroa Road, Greytown, Wairarapa and covers approximately 219ha (see figure 1 below). The land on which the proposed solar farm is to be located is classified as Land Use Capability (LUC) unit 4s 1 by the New Zealand Land Resource Inventory (NZLRI) and is therefore outside of the Highly Productive land (HPL) category. The soils at the site are mapped by the NZLRI and S-Map as very stony causing severe limitations to arable use and being suitable for grazing, root and green fodder cropping and forestry.



Figure 1. Approximate proposed solar farm area.

Proposed Solar Array Structures

The following information has been supplied to Hanmore Land Management Ltd by Far North Solar Farm Limited (FNSF) regarding the proposed solar array structures and supporting hard stand areas for inverters and a substation.

This project will use a single axis tracking system, arranged in a 2-modules-in-portrait configuration. The arrangement will include 28/14 modules in series, corresponding to 2x28 and 2x14 table arrangements. The solar panels will be mounted on H piles driven into the ground as illustrated in Figure 2 below. Piles will be 50mm wide with a maximum cross section height of 150mm and be driven 1.2m into the ground, with approximately 80,290 piles across the whole site. Hard surface areas will be needed for 39 x 20' shipping containers (6.06mx2.43m), for inverters and the size of two shipping containers for an office building. (details are subject to slight changes after geophysical testing conducted by the EPC team).

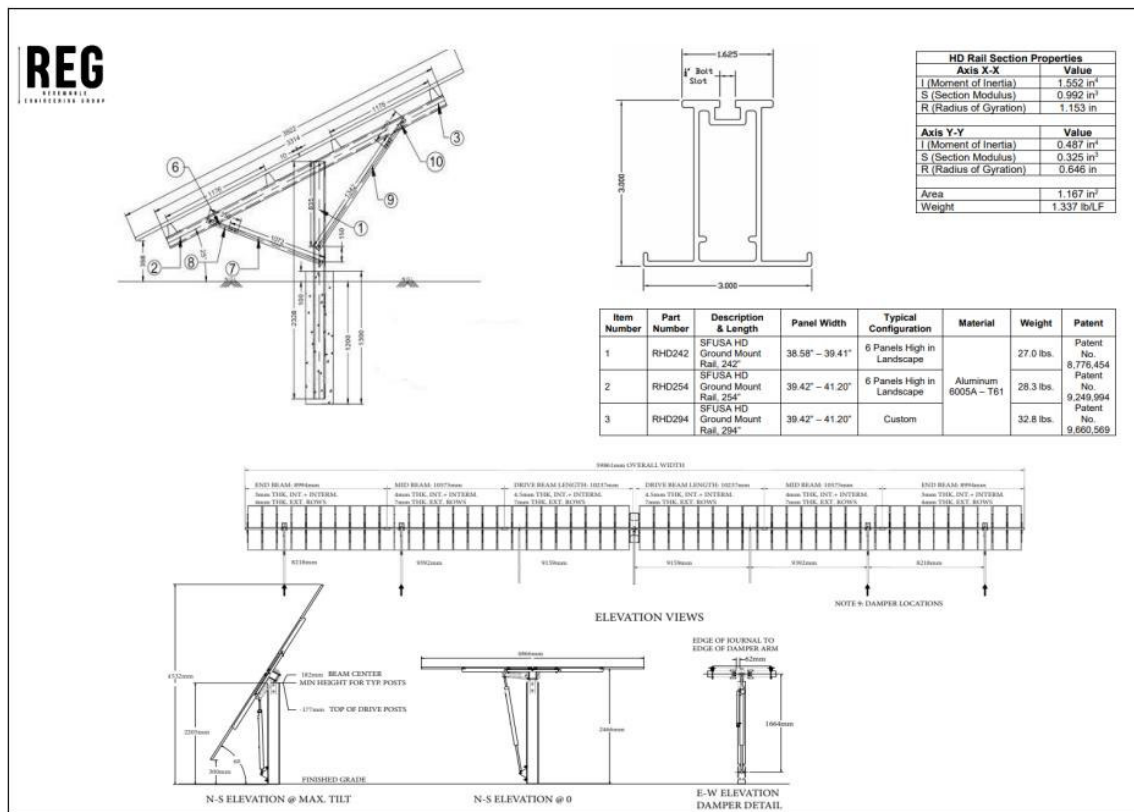


Figure 2. Proposed solar panel structures.

While the solar farm is in operation the area will be grazed by sheep to control pasture growth and when the project is decommissioned structures will be unscrewed and removed, piles uplifted and wiring/cabling taken out.

Soil Surface Area Impacted

Based on the information supplied by FNSF the total surface area of ground impacted by the installation of the solar structures has been calculated below.

Area for 20' shipping containers: $41 \times 6.06 \times 2.43 \text{m} = 603.7578 \text{m}^2$

Total surface area impacted: 603.7578m^2

Total area of the project approximately $219 \text{ha} = 2,190,000 \text{m}^2$

Percentage of whole site impacted by structures: **0.03%**

Assessment of Effects on HPL

As can be seen from the calculations above the total surface area impacted by the proposed solar structures is approximately 604m². In the context of the whole site this area will have a less than a minor impact on the site and would not be dissimilar to any agriculture or horticulture operation. Using H piles rather than solid piles to support the solar panels will minimize soil impacts and have a negligible impact on soil structure across the site.

The overall project will be potentially more beneficial to soil structure and long-term potential productivity than many farming operations. Eliminating the possibility of future heavy stock such as cattle and cropping operations will minimize the risk of soil compaction and organic matter loss due to pugging damage, cultivation and machinery movement. If good stock and pasture management are followed on the proposed site soil structure, water hold capacity, aeration and nutrient status will be improved through minimizing compaction and increased organic matter incorporation in the soil profile. When the project is decommissioned, as outlined by FNSF, minimal soil disturbance will occur which will preserve the productivity potential of the HPL.

Over the life of the proposed project energy generation will be the main production focus with primary production on the site continuing in a supporting capacity through sheep grazing for meat production. The project itself as outlined above will not reduce or negatively impact the productivity potential of the soil. When the project is decommissioned, the land will be available for primary based production with potentially improved soil structure and productivity potential.