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31st January 2026

Far North Solar Farm Ltd
Unit A7
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Auckland 0812

Attention: [REDACTED]

Re: Response to RFI 1.10 dated January 23 concerning The Point Solar Farm

Haigh Workman was engaged by Far North Solar Farm Ltd to respond to the Environmental Protection Authority concerning the treatment and discharge of stormwater for the proposed development of The Point Solar Farm - located in Ohau, Mackenzie Country. The relevant RFI point from 23 January is worded as follows:

1.10. Treatment and Discharge standards

Detail is missing from the proposal as to discharge stormwater from both the construction phase and operational phase and no draft Erosion and Sediment Control Plan is provided.

The requests for information are:

- a) What methods of treatment are proposed for stormwater prior to discharge?*
- b) What standards are to be met by the proposed discharges (e.g. clarity, pH, contaminants etc).*
- c) How are proposed standards to be monitored?*
- d) Provide a copy of a draft Erosion and Sediment Control Plan.*

This memorandum addresses these concerns.

Operational Phase

The RFI makes reference to the stormwater discharge during the operational phase of the project. A comprehensive stormwater management plan has already been provided by Haigh Workman (*Stormwater Report For Proposed Solar Farm At The Point, Ohau C, Mackenzie Country, 2 August 2023*)

The report details that the project can achieve stormwater quantity neutrality and even a decrease in peak flowrate in flood events. Control of the peak rates is achieved by the planting of 89ha of existing farmland with low lying native plants around the border of the proposed solar farm. The proposed landscaping will intercept and retain sheet runoff. Peak runoff will further decrease with the erection of the proposed photovoltaic tables. The partial shading from the PV modules will increase grass growth under the panels which in turn increase the retention of stormwater by evapotranspiration.

The proposed development meets Objective 2 of the Mackenzie District Plan 2022 and Policy 4.3 and Schedule 5 of Operative Environment Canterbury Land and Water Regional Plan 2018. There is no regional standard for assessment of runoff effects. GD01: Stormwater Management Devices in the Auckland Region and Section 2.1 of E1/VM1 of the NZ Building Code were used as standard methodology for assessing runoff effects.

Water quality of stormwater is expected to remain the same or improve in the parameters set out in Schedule 5 of the Canterbury Regional Plan. Temperature increases are not foreseen as rainwater will only run on impervious PV

modules for a short period. The hydraulic retention time will not decrease but increase as the proposed native planting strip will intercept sheet runoff. E.Coli and other faecal contaminants are likely to decrease as cattle grazing is to be replaced with sheep grazing. Because no adverse effects to stormwater quality or quantity can be expected during the operational phase, there is no need for ongoing monitoring of stormwater runoff quality for contaminants.

Construction Phase

The final operative state of the project is to result in a decrease of 0.54m³/s from the site in a 10% AEP rain event. A reduction in runoff is therefore also expected in a 20% AEP event. At no point during the construction of the solar farm can runoff effects be expected to increase. Policy 4.3 of the Operative Environment Canterbury Land and Water Regional Plan 2018 is met at all points of the project.

Because the proposed solar panels do not change the runoff coefficient of the existing ground, it is not necessary to stage the native landscaping before the erection of the photovoltaic gear to maintain stormwater neutrality. The phasing of the construction can be determined by other criteria.

Erosion Sediment Control

The site topography is flat to uniform shallow incline. The ground conditions are alluvial soils with a high percentage of river gravels and boulders with good infiltration rates.

Expected cut/fill earthworks quantities are as follows:

Piling for the PV tables	4800m ³
Transpower Substation in the centre of the Solar Farm	4041m ³

Approximately 385000 piles for the PV tables are expected to be erected for the project. The intention is to drive piles with no excavation. However, because of the presence of large rive boulders it is reasonable to assume some holes will need to be excavated. We have made an allowance for 5% of the pile holes to be excavated with and cut and fill volume of 0.25m³/pile for our assessment

A preliminary assessment of the expected sediment yield has been assessed using the Universal Soil Loss Equation (see calculation in Appendix A). Because of the alluvial nature of the soil, the expected sediment yield from the construction phase of the project is not expected to exceed 19 tonnes. Such a volume can adequately be controlled with standard erosion sediment control practices.

Sediment from the expected earthworks can be managed with seasonal timing, contour draining, and silt fencing in keeping with the Environment Canterbury Erosion Sediment Control Guidelines. Check dams may also be required at the overland flowpaths on the eastern side of the site (See Section 3.2.2., *Haigh Workman*, August 2023).

Schedule 24c of The Regional Plan, Valley Floor Area River Bank Erosion Plan, states the following:

5. provide an assessment of the effects of the proposed activities, at a level of detail commensurate with the scale and significance of the effects, on:
 - (a) water quality of surface waterbodies, sources of human or animal drinking-water, aquatic ecosystems inanga spawning habitat of other fish and inanga spawning habitat; and
 - (b) the flood carrying capacity of the river.

A more detailed draft Erosion Sediment Control plan in keeping with the *Environment Canterbury Erosion and Sediment Control Guidelines* is currently being prepared by Haigh Workman. However, because the stormwater effects on the receiving waterbody and the erosion risk to the river bank from the project is minimal, we believe this initial assessment is commensurate for consent consideration.

Disclaimer

This report has been prepared for the sole use of our Client, Far North Solar Farm Ltd, with respect to the particular brief outlined to us. It may not be used or relied on (in whole or part) by anyone else, or for any other purpose or in any other contexts, without our prior written agreement. This report may not be read or reproduced except in its entirety.

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Appendix A: Sediment Yield Calculation

The Universal Soil Loss Equation

A = RKLSCP

Where: A – average annual soil loss
R – rainfall erosion index
K – soil erodibility
L – Slope length
S – slope steepness
C – cover and management
P – support practice

For a 18-month construction period we can determine the following:

NIWA HIRDS data gives a the RCP 6.0 2-year storm event (6 hour duration) for the site as 26.2mm.

$$R = 0.00828 * (0.628 * 26.2)^{2.2} * 1.7 = 6.672$$

Using the triangular nomograph from Wischmeier et al. (1971) for the soil erodibility index, K:

$K = (0.37 - 0.06) * 1.32 = 0.4092$ (assumes 40% sand, 40% silt, and 20% clay content in undersoil with a minimum 4% total earthworks as topsoil)

Assuming an average slope length of 300m and steepness 2%:

$$LS = 0.4$$

Assuming undisturbed pasture for the ground cover for the duration of the works

$$C = 0.02$$

Assuming the ground will have a roughness similar to its existing state for the majority of the earthworks:

$$P = 1.0$$

Therefore:

$$A = 6.672 * 0.4092 * 0.4 * 0.02 * 1 = 0.022 \text{ tonnes/ha/year}$$

Sediment Yield to be expected in the planned works is

:

$$0.022 * 570 * 18/12 = 19 \text{ tonnes.}$$

The above sediment yield calculation provides guidance on the scale of the environmental risk of the earthworks and the Erosion Controls need to be chosen in accordance with the risk.

The sediment yield is not uniform and more yield can be expected in the location of the proposed substation.