SUMMARY OF EVIDENCE OF HADEE THOMPSON-MORRISON
DATED: 5 March 2024

My name is Hadee Thompson-Morrison. I hold a Masters degree in Environmental Management from Massey University and a PhD in Environmental Science from the University of Canterbury. I have been a member of the New Zealand Society of Soil Science since 2016. My current role is as a Land Scientist – Environmental Contaminants at Manaaki Whenua – Landcare Research and I have been employed in this role since May 2023. Prior to this, I worked as a Land Resource Scientist at Environment Canterbury Regional Council for one year. My past and current research concerns soil quality with a particular focus on environmental contaminants, namely, heavy metals.

On 22 February 2024 I assessed the soil order and structural state of unirrigated soils in the vicinity of solar panels at 56 Buckleys Road, Canterbury. I also assessed soils in surrounding irrigated dairy pasture as a measure of comparison. In my report, I made a conclusion that the findings were inconclusive as the comparison was confounded by the fact that the soils in the vicinity of solar panels were non-irrigated and dry while the soils under surrounding pasture were irrigated. I consider however, that given this proposal does not intend to irrigate the site, this would be a representation of what soils under and within the proposal site will become.

I note in my evidence that the structure of the unirrigated soils in the vicinity of the solar panels differed to the structure of the pasture topsoils. The topsoils between the solar panel rows were cracked, while in the irrigated pasture, the topsoils were less hard and did not show obvious cracking. Whilst I had not been able to determine whether these difference were due to the presence of solar panels or other factors, it is now confirmed that there is no intention to irrigate the site (other than the amenity planting), so I consider that these findings are a clear representation of the impacts this proposal would have on the soil structure.

By way of a summary, the unirrigated soils in the vicinity of the solar panels were very dry, as was all the overlying vegetation. The soil was classified as a Mottled Argillic Pallic soil, and the topsoil was 23 cm deep and had a medium degree of structure. Some clumps/clods were present in the topsoil. The consistence was very hard, i.e. the soil had to be crushed underfoot to be broken apart. The topsoil structure and depth was assessed in the other soil pits and small holes in the vicinity of the existing solar panels. Most soil pits and holes underneath the panels, under the dripline of the panels and outside the edges of the solar panelled area were concluded to have similar topsoil depth, horizon depth, and other visual characteristics to the pit from which the full soil order description was done. In one of the pits located between solar panel rows near the centre of the area under solar panels, the topsoil showed wide cracking.

This can be compared with the soils and characteristics of the soils found in an areas of irrigated dairy pasture and adjacent to the Proposed Solar Site (approximately 20 m from the fence line, across a hedge, fence and track from the Proposed Solar Site). Here, one 60 cm deep pit was assessed, and like the soil around the solar panels, was classified as a Mottled Argillic Pallic soil. The pasture overlying the soil here was green, and the soil was less dry than the soil under the solar panels. The topsoil was 18 cm deep, and had a medium degree of structure.

In conclusion, there were stark differences in pasture and soil condition in these different locations, with soils in the area around the solar panels being substantially harder and dryer. It is likely that the cracking and consistence of soils under the solar panels were due to the location and unirrigated nature of the soils.