

**BEFORE THE INDEPENDENT COMMISSIONER
OF CENTRAL OTAGO DISTRICT COUNCIL**

IN THE MATTER of the Resource Management Act 1991 ("**RMA**")

AND

IN THE MATTER of an application for resource consent by Helios OTA
OP LP ("**Helios**") to construct, operate and maintain a
photovoltaic solar farm and associated infrastructure
including a substation and transmission line
infrastructure for renewable electricity generation at
48 Ranfurly-Naseby Road, Naseby ("**Project**")

**STATEMENT OF EVIDENCE OF DR JAZ NYE MORRIS
ON BEHALF OF HELIOS**

21 JULY 2025

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1. EXECUTIVE SUMMARY

- 1.1 My evidence describes the existing terrestrial ecology environment and assesses relevant effects of the proposed Helios photovoltaic solar farm at 48 Ranfurly-Naseby Road, Naseby (“**Site**”).
- 1.2 My evidence focuses on terrestrial vegetation (including wetlands) and terrestrial fauna (excluding birds, which are discussed in separate evidence by my colleague Karin Sievwright). I was an author of the Ecological Impact Assessment report for the Project and have visited the Site to undertake ecological surveys.
- 1.3 The Site is predominantly exotic pasture or short rotation cropland grazed by sheep and beef cattle. Indigenous plant species comprise relict shrubs scattered in places along fence lines and limited other species found in wetlands. The pasture is of negligible ecological value, but indigenous shrubs are of greater value. Two main wetlands on the Site (the ‘central’ and ‘southwest’ wetlands) are impacted by existing land use but support indigenous species and are of moderate value. The Site also includes 44 very small features that are technically wetlands but of negligible value due to a general lack of indigenous species and their context among farming land use.
- 1.4 The Project has been designed to avoid all wetlands, with wetland-specific setbacks of between 5–10 metres, and the proposed use of horizontal directional drilling in sensitive areas when installing electrical cabling to prevent surface disturbance. A small number of indigenous shrubs within the development footprint will be cleared, but this impact will be remedied through planting at least double the number of shrubs in other areas including along Site boundaries and at the margins of the two larger wetlands.
- 1.5 I conclude that the Project will avoid adverse effects on wetlands and will appropriately manage impacts to indigenous shrubs. The proposed fencing and enhancement of the two larger wetlands are expected to result in a net ecological gain for these features.
- 1.6 There are only two main differences between my conclusions and the conclusions of the s42A officer’s report and an accompanying technical peer review; these relate to wetland setback distances, and the need for further plant surveys. I do not consider these differences are critical or unable to be resolved.

- 1.7 I have had input into the Applicant's proposed conditions of consent (updated version attached to the Statement of Evidence of Ms Banhidi), and I consider the ecological effects of the Project can be appropriately managed via implementation of the requirements of those conditions.

2. INTRODUCTION

- 2.1 My full name is Dr Jaz Nye Morris. I am a Senior Ecologist / Associate Principal with Boffa Miskell Limited ("**Boffa Miskell**"), a national multi-disciplinary environmental planning and design consultancy.
- 2.2 I have a Doctor of Philosophy from the University of Otago (2018) for botanical studies and a Bachelor of Science with Honours First Class in Botany (2011) from the University of Otago.
- 2.3 I have practiced as a full-time consultant ecologist for six years since joining Boffa Miskell's Christchurch office in 2019. In this role I provide ecological consultancy services to a wide range of clients throughout the South Island. I specialise in the survey and assessment of terrestrial ecological values and preparation of ecology reports for Assessments of Effects on the Environment. My primary area of expertise is plant ecology.
- 2.4 In the course of my work, I have provided ecological advice in relation to numerous solar farm proposals in the South Island (over 10) that are currently at various stages of development, from scoping through to construction phase. I have expertise in wetland assessment, including undertaking wetland monitoring, wetland delineation, and wetland assessment in relation to consenting over the course of a nine-month part-time secondment to Environment Canterbury Regional Council (Land Ecology Science team, 2024-2025). More generally, I have prepared evidence on terrestrial ecology matters for Council Hearing processes and provided ecological peer review advice to District Councils. My previous work experience from 2010-2018, largely alongside postgraduate study in the Botany Department of the University of Otago, included various botanical surveys in the South Island high country. I have published ecological and botanical research relating to my postgraduate studies in national and international peer-reviewed journals.

Involvement in the Project

- 2.5 My role in relation to Project has been to provide advice to Helios regarding the existing ecological environment and ecological impacts, particularly in relation to vegetation and wetlands.

- 2.6 I co-authored the 'Mānīatoto Solar Farm: Ecological Impact Assessment' ("**EclA**") report, dated 18 December 2023, which formed part of the Assessment of Environment Effects ("**AEE**") that was lodged with Central Otago District Council ("**CODC**") for the project. During preparation of the EclA, I visited the Site on 12-15 June 2023. Following lodgement of the consent applications, I have also been involved in pre-hearing discussions with representatives of the Director General of the Department of Conservation ("**DOC**") in relation to their submission on the consent application, and I have briefly discussed the application in a call with Andrew Wells of Wildland Consultants Limited ("**Wildlands**") in his capacity as peer reviewer for CODC.
- 2.7 In preparing this statement of evidence I have considered the following documents:
- (a) The AEE accompanying the Application¹;
 - (b) Submissions relevant to my area of expertise;
 - (c) The statement of evidence on avifauna (birds), prepared by Ms Sievwright;
 - (d) The statement of evidence on landscape matters, prepared by Ms McManaway; and
 - (e) The s42A Report prepared by Adam Vincent on behalf of CODC and the associated ecology peer review report prepared by Andrew Wells and colleagues from Wildlands².

Code of conduct

- 2.8 I confirm that I have read the Expert Witness Code of Conduct set out in the Environment Court's Practice Note 2023. I have complied with the Code of Conduct in preparing this evidence and will continue to comply with it while giving oral evidence before the Hearing Commissioners. Except where I state that I am relying on the evidence of another person, this written evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.

¹ Updated version dated 16 June 2025.

² Wildland Consultants (2025). Review of Helios Solar Farm Ecological Assessment. *Wildland Consultants Contract Report No. 7661*. Prepared for Central Otago District Council. 16pp.

- 2.9 I am also a Certified Environmental Practitioner with the Environment Institute of Australia and New Zealand ("**EIANZ**"), a full member of EIANZ, and am bound by the Institute's code of ethics.

3. SCOPE

- 3.1 This evidence is given in respect of the resource consent application by Helios for the proposed solar farm at 48 Ranfurly-Naseby Road, Naseby (the "**Site**"). In my evidence I will:

- (a) Describe the Site investigation and ecological impact assessment methods;
- (b) Describe the existing terrestrial ecological environment of the Site;
- (c) Assess how the project could impact those existing ecological values, and outline proposed impact management measures;
- (d) Address relevant matters raised by submitters to the Application; and
- (e) Address relevant matters raised in the CODC officer's report (issued under s42A of the RMA).

- 3.2 The scope of my evidence does not include avifauna (birds), which are addressed by Ms Sievwright in her statement of evidence.

4. METHOD OF ASSESSMENT AND INVOLVEMENT IN PROJECT SHAPING

Desktop and Site Investigations

- 4.1 The assessment method that I applied involved field and desktop investigations to assess the type, cover, and condition of terrestrial vegetation and wetland habitats present at the Site, in consideration of the ecological context of the Site in relation to the immediate area and wider Mānīatoto Ecological District ("**ED**"). Details of the investigation and assessment methods applied are set out in full in Section 4.2-4.8 of the EclA. The effects assessment methodology broadly followed the Environment Institute of Australia and New Zealand's (EIANZ) EclA guidelines³.

³ Roper-Lindsay, J., Fuller, S. A., Hooson, S., Sanders, M. D., & Ussher, G. T. (2018). Ecological impact assessment (EclA). *EIANZ guidelines for use in New Zealand: Terrestrial and freshwater ecosystems (2nd ed.)*. Environment Institute of Australia and New Zealand.

- 4.2 In relation to field surveys, I consider that these were thorough, with six days spent on Site across two visits during two seasons (by two qualified ecologists on any given day). Wetland assessment following the Wetland Delineation Protocols⁴ incorporated within the National Policy Statement for Freshwater Management (2020) ("**NPS-FM**") was thorough and involved the use of 49 2x2 m vegetation plots at various locations across the Site (refer to Section 4.3.1.2 of the EclA). This assisted the assessment of the location and extent of wetlands within the Site.
- 4.3 In response to comments made in the s42A, I provide further discussion on survey timing and coverage (and detection of indigenous plant species) in paragraph 8.6 of my evidence below.

Project Shaping

- 4.4 As described in Section 3 of the EclA, the ecological surveys that informed the EclA were carried out based on a draft solar farm layout. Following the collection and analysis of the field data, I provided advice to Helios that informed an iterative process of project shaping that resulted in:
- (a) a change to the proposed solar farm layout to fully avoid all wetlands, with setbacks (in terms of the locations of solar arrays, roads, and other infrastructure); and
 - (b) avoiding or minimising any temporary construction effects to wetlands, by adopting lower impact construction methods. For example, horizontal directional drilling ("**HDD**") is proposed to direct necessary electrical cabling beneath a wetland in one location, rather than other more damaging methods e.g., cable laying via open trenching.

5. EXISTING ECOLOGICAL ENVIRONMENT – VEGETATION, WETLANDS, AND TERRESTRIAL FAUNA HABITATS

Change since EclA prepared

- 5.1 Since the EclA was prepared, an updated national threat classification assessment for indigenous plants was released by DOC⁵, and a report

⁴ Ministry for the Environment. 2022. *Wetland delineation protocols*. Wellington: Ministry for the Environment.

⁵ de Lange, P. J., Gosden, J., Courtney, S. P., Fergus, A. J., Barkla, J. W., Beadel, S. M., Champion, P. D., Hindmarsh-Walls, R., Makan, T., & Michel, P. (2024). Conservation status of vascular plants in Aotearoa New Zealand, 2023. *New Zealand Threat Classification Series* 43. Department of Conservation, Wellington.

assessing the conservation status of indigenous plant species specifically within the Otago region has also been released by Otago Regional Council ("ORC")⁶. Following these reports, the shrub tūmatakuru / matagouri (present at the Site) is now nationally and regionally classified as Not Threatened (previously, it was nationally At Risk – Declining). Having considered these recent reports, and whilst the national or regional threat status for a small number of plant taxa now differs from the EclA, these changes do not materially affect my findings or subsequent recommendations relating to indigenous plant species as stated in the EclA.

Ecological Context

- 5.2 The Site is located within the Mānīatoto ED, between 500-560 m elevation with a cool semiarid climate with hot and dry summers and cold frosty winters with snow on the ground at times. In terms of the Threatened Environment Classification⁷ the Site is within a land environment (N5.1a), where <10% indigenous vegetation remains. This reflects that, nationally, almost all other similar land environments have been converted to pasture or other exotic vegetation types (as has occurred at the Site). There are no naturally uncommon ecosystems on the Site. Surrounding land use is generally pastoral farming, aside from large areas of plantation conifer forest to the northeast.
- 5.3 A full description of the existing ecological context is provided at Section 5.1 of the EclA.

Terrestrial Vegetation

- 5.4 The main vegetation type across the Site is exotic grassland / cropland (paddocks of improved pasture and short rotation crops comprise c.95% of the Site). The Site is currently grazed by sheep and beef cattle and is not irrigated. It appears that most, if not all, areas of the Site (outside wetlands) are regularly mechanically cultivated. All the original (pre-European) indigenous vegetation cover has been removed from the paddocks. All existing indigenous plants persist as sparse isolated shrubs along internal and external fence lines or occur within wetlands (described below).
- 5.5 Overall, I conclude that exotic pasture areas (including shelterbelts) are of negligible ecological value. However, based on a conservative approach, I

⁶ Jarvie, S., Barkla, J., Rance, B., Rogers, G., Ewans, R., Thorsen, M. (2025). Conservation Status of Indigenous Vascular Plants in Otago, 2025. *Otago Threat Classification Series 9*. Otago Regional Council, Dunedin.

⁷ Walker, S., Cieraad, E., & Barringer, J. (2015). *The Threatened Environment Classification for New Zealand 2012: A guide for users* (Landcare Research Contract Report No. LC2184). Landcare Research. It should be noted that the TEC does not reflect loss of habitat or gain in protected areas that has occurred in the last 15 years or so.

consider the indigenous shrubs matagouri, mākaka / desert broom (regionally and nationally At Risk – Declining), scrub pōhuehue, and porcupine shrub that are present along internal fence lines (which I consider are relict and survive only because they are present on fence lines / have not been removed by grazing and trampling) generally have high value.

- 5.6 A full description of the existing terrestrial vegetation is at Section 5.2.1 of the EclA.

Wetlands

- 5.7 As described in more detail in Section 5.2.2 of the EclA, there are three wetland types / locations within or at the margins of the proposed solar farm:

- (a) Various (44) 'small wetlands' (range between 0.008-0.69 ha, average 0.13 ha, total 8.86 ha);
- (b) 'Central wetland' (8.49 ha); and
- (c) 'Southwest wetland' (4.61 ha).

- 5.8 A Vegetation Map is provided in Appendix 5 in the EclA and reproduced as **Attachment 1** in my evidence. The assessment of these wetlands confirmed that they met the definition of 'natural inland wetland' as defined within the NPS-FM⁸. For completeness, I also note that the Site contains several constructed farm ponds; these are not 'natural inland wetlands.'

- 5.9 Overall, I conclude that 'small wetlands' are of negligible ecological value. However, I note the rarity 'matter' (one of four assessment components that forms part of the overall ecological value score) is 'moderate', reflecting the induced scarcity of wetlands nationally and regionally. The 'central' and 'southwest' wetlands are, overall, of moderate ecological value. These larger features score 'high' in terms of rarity, owing not only to the scarcity of wetlands but also due to the presence of At Risk – Declining (Regionally Endangered and Regionally Vulnerable) plant species.

Terrestrial Fauna Habitats (Excluding Birds)

- 5.10 As described in the EclA at Section 4.8, the build area of the Site (i.e., where construction works would occur and where solar arrays would be installed) is unlikely to provide suitable habitat for indigenous lizards, nor any likely habitat for important assemblages of indigenous terrestrial invertebrates. Any potential

⁸ Noting that ORC is the regulatory authority in respect of the NPS-FM.

habitat for lizards within the Site is outside of the build area, such as in wetlands. From my Site observations, I conclude that invertebrate habitat provided by indigenous shrubs within the Site is likely to be marginal (due to the scattered nature, low numbers, and poor condition of the extant shrubs) but is of better quality along Site boundaries and in a shrubland area in the northeast (both outside the build area). Bird habitats and species are described by Ms Sievwright in her statement of evidence.

Ecological Significance

- 5.11 The operative Central Otago District Plan ("**CODP**") does not identify any sites that are ecologically significant under section 6(c) of the RMA within or immediately adjacent to the Site. Nevertheless, I conclude (as detailed within the EclA in Section 6) that the Site is ecologically significant in terms of regional and national statutory criteria.
- 5.12 The significant features are the presence of nationally At Risk – Declining desert broom shrubs⁹ (meeting rarity criteria), and the central and southwest wetland (meeting rarity criteria and ecological context criteria).
- 5.13 The 'small wetlands' that support indigenous plant species are also considered significant in terms of the statutory assessment framework, due solely to the fact that the induced scarcity of wetlands nationally and regionally means that they meet rarity criteria under each assessment approach.

6. ECOLOGICAL IMPACT ASSESSMENT – VEGETATION AND WETLANDS

- 6.1 The ecological impacts of the project in terms of vegetation and wetlands are described in detail with the EclA (Section 7.1) and are summarised below.

Terrestrial Vegetation

- 6.2 Following construction of the Project, the Site will continue to be maintained largely as exotic pasture and used for sheep grazing. I maintain the conclusion in the EclA that temporary clearance and permanent loss of exotic pasture is not of ecological concern¹⁰. Based on Table 1 of the EclA this would occur across a total of c.15 ha (across the c.660 ha Site).

⁹ Approximately 100 desert broom plants are present within the Site, with greater numbers present on Site boundaries (outside the footprint of all proposed works). The EclA also considered matagouri to be an ecologically significant feature of the Site, based on its national threat status at the time. This is not an important difference in terms of the findings of my evidence compared to the EclA and it does not alter my conclusion that impacts to these shrubs should be remediated.

¹⁰ Other than insofar as the pasture provides habitat for indigenous birds, as discussed by Ms Sievwright in her evidence.

- 6.3 As described in the EclA, I estimate that several hundred shrubs (matagouri, desert broom, porcupine shrub and scrub pohuehue) that are present along internal fence lines will be cleared (lost) during Site development and construction. These shrubs cannot practically be avoided within the Site during construction including the removal of most internal fencing, but shrubs on the Site's external boundaries are able to be avoided, meaning that overall, the Project minimises (but does not fully avoid) impacts.
- 6.4 The magnitude of effect at the scale of the Site is moderate (as no shrubs would be cleared on external Site boundaries), but negligible at the scale of the ED. This translates to a high-level impact at the scale of the Site (particularly based on one of these species being an At Risk – Declining species of high value), but a very low level effect at the scale of the ED.
- 6.5 Considering the relative ecological importance of the shrubs that would be lost within the Site, and the widespread historic loss of these species on similar land environments, I maintain my conclusions as stated in the EclA that remediation of all losses of these shrubs is required to achieve no net loss (and preferably a net gain) in significant ecological values.
- 6.6 This recommendation has been adopted by Helios, and remedial plantings of these species within screen plantings on Site boundaries and on boundaries of the two larger wetlands is a component of the project's Landscape Planting and Maintenance Plan ("LPMP"); as addressed by Ms McManaway in her statement of evidence. Whilst the LPMP is high-level and does not include detailed planting schedules and numbers, the large scale of proposed planting will easily achieve my recommendation. I consider that this will comfortably exceed requirements under the volunteered draft conditions of consent that require plantings of a minimum of double the existing number of shrubs.
- 6.7 I consider an important beneficial element of the proposed plantings is the fact that the shrubs will be planted into fenced areas (wetlands and screen plantings) without stock. This provides the potential for ongoing recruitment and long-term persistence of native shrubs at the Site, whereas the existing plants are relict and functionally extinct.

Wetlands

- 6.8 I note that wetlands generally fall within the regulatory scope of ORC, but they are described here to provide a full picture of ecological values at the Site and what is expected to occur as a result of the project. Several submitters have raised matters relating to wetlands.

- 6.9 I also understand that any ORC consents required to construct the Project are to be sought separately. The EclA was prepared anticipating a possible need for ORC consents, and accordingly it already provides an assessment of whether any direct or indirect effects to wetlands (such as hydrological changes) are likely to arise. I am not aware of any changes to the proposal that would alter my opinions regarding ecological effects to wetlands compared to what is already stated in the EclA (at Section 7.1.2).
- 6.10 As I have described in Paragraph 4.4 above, the Project layout has been designed to avoid all wetlands. This means that there would be no earthworks or vegetation clearance within any wetlands. Earthworks or vegetation clearance would occur only beyond ≥ 5 m setbacks (for small wetlands) or ≥ 10 m setbacks (for the central and southwest wetlands).
- 6.11 Section 3 of the EclA outlines wetland setback distances but does not provide detailed rationale. My advice to Helios regarding wetland setbacks considered the following ecological matters:
- (a) Firstly, I consider it appropriate to avoid all works within wetlands, to avoid placing solar panel arrays above wetlands (even where this could be achieved without ground disturbance), and to generally maintain existing environmental conditions and wetland hydrology.
 - (b) Secondly, I consider that at least some setback is required, to minimise shading, to provide at least some buffer of undeveloped land, and to leave space for ongoing operational access around the solar arrays without straying into wetlands (e.g. in a vehicle).
 - (c) Thirdly, in my view, solar panel piling, trenching works, works to construct internal accessways, and the installation of inverters (etc.) are unlikely to alter existing hydrological sources to any existing wetlands. This is because:
 - (i) As I described in Section 5.2.2 and 7.1.2.2 of the EclA, the hydrological drivers of wetlands at the Site are generally rainfall for the 'small wetlands', a combination of rainfall and groundwater for the 'central wetland,' and rainfall, groundwater and a stream for the 'southwest wetland.' The majority of the small wetlands at the Site are small depressions where direct rainfall accumulates, and it is noteworthy that many depressions are located within overall elevated areas. This clearly indicates to me that

these features do not rely on conveyance of overland flows / rainfall runoff over long distances.

- (ii) Because land contours would be generally maintained, existing rainfall would run off from solar panels and follow existing drainage patterns, including whatever existing drainage to wetlands currently occurs. Direct rainfall to wetlands would remain, because no solar panel arrays or other structures would be placed over the wetlands. Trenching works for cabling are shallow and unlikely to intercept or alter groundwater flow paths or patterns.

- 6.12 In other words, the setbacks required, in my view, are only what is needed to avoid adverse ecological impacts. Ultimately, I advised Helios that a minimum 10 m setback distance was required for the 'central' and 'southwest' wetlands, and a minimum 5 m setback was required for 'small wetlands.'

'Central' and 'Southwest' Wetlands

- 6.13 The 10 m setback distance recommended for the central and southwest wetlands recognises their higher ecological values, provides suitable space for their fencing and for ecological enhancement planting, and contributes by making the size and shape of these wetland areas overall better buffered and ecologically resilient.
- 6.14 The 'central' and 'southwest' wetlands will be fenced and destocked. Accounting for at least 10 m setbacks from the wetland edge, this would set aside c.20.5 and c.9.8 ha respectively, or c.31.3 ha in total. Existing grazing is likely to lead to a variety of ongoing existing impacts to indigenous wetland vegetation, and in the absence of grazing it is likely that palatable indigenous species would recolonise or expand, and wetland condition will improve.

'Small Wetlands'

- 6.15 The 'small wetlands' (Figure 1) are of negligible value and are dominated by exotic species (vegetation plots in 19 of the 44 did not record a single indigenous plant, and the remaining 25 had only small numbers of common and widespread grazing tolerant indigenous rushes and sedges). The solar farm proposal already contains a built-in beneficial element for the 'small wetlands' in that grazing during the Project's 35 year operational period will be only by sheep, which typically cause less damage to wetlands than cows.

- 6.16 Even in the context of negligible existing values of the small wetlands and the change to sheep grazing, a 0 m setback would not necessarily avoid adverse effects due to possible operational impacts, shading, or any possible margin of error in wetland mapping. A small (e.g.) 2 m setback would likely still lead to those slight risks. In my view, a minimum 5 m setback provides reassurance on all fronts that the wetlands will be fully avoided and in my opinion is therefore appropriate from an ecological perspective.
- 6.17 Considering that unbuilt areas of the solar farm will remain in sheep grazed exotic pasture, there will be no adverse impacts to the smaller wetlands with a 5 m setback in place. There is also no ecological benefit in maintaining greater setbacks of pasture surrounding the 'small wetlands' (i.e. there is no need to apply the same 10 m setback as I have recommended for the larger wetlands).
- 6.18 To provide electrical connections across the Site, cabling will need to cross the central wetland. As noted in paragraph 4.4(b) and in the AEE, this will be achieved by HDD at one location beneath a naturally narrow section of the wetland. The HDD approach has been adopted specifically to avoid any permanent or temporary vegetation clearance or surface earthworks within wetlands. Other options that were ruled out included above-ground (overhead) powerlines and trenching through the wetland; these were not adopted based on landscape / visual and ecological advice respectively.
- 6.19 Because of these avoidance, setback and fencing measures, the use of HDD, and the lack of other works in or near wetlands, the project would not result in any adverse effects to any wetlands at the Site. Fencing of the southwest and central wetland and status quo (or better¹¹) conditions for wetlands elsewhere means that overall impacts to wetland habitats at the Site are of a positive magnitude, i.e. a net gain level of effect for the ecologically significant wetland values at the Site.



Figure 1. Typical 'small wetland' at the Site, October 2023. Vegetation plot (#217) and wetland (upper image) and detail of plot (lower image). In this case 100% of cover within the plot was exotic grasses and exotic herbs (90% was the grass creeping bent). Note also the isolated indigenous shrubs along a fence line in the upper image. The mapped wetland boundary is approximately the change in slope angle, outside the area of ponded water and outside (beyond) the plot, near where there is a slight vegetation transition to taller (golden / brown) pasture grass. A 5 m construction setback from this boundary would appropriately avoid any adverse effects.

- 6.20 Helios have also adopted my additional suggestion to undertake wetland restoration at the 'central' and 'southwest' wetlands. As stated in the EclA, in my view this means that the Proposal is likely to achieve an additional benefit (a greater net gain) for wetlands compared to simply avoiding them.

Other

- 6.21 I maintain the conclusions of the EclA that:
- (a) No other ecological impacts typically associated with large infrastructure projects (e.g., introduction and spread of weeds) are considered of concern in the context of this Project.
 - (b) Other possible impacts from solar farm proposals, such as the potential for microclimatic change (shading, soil moisture changes due to the solar panel arrays) to alter vegetation composition and growth rates are not of concern in relation to exotic pasture.

7. RESPONSE TO RELEVANT SUBMITTERS

- 7.1 I have read the submissions from DOC, Kā Rūnaka, and from other submitters that raise matters within my area of expertise (especially wetlands).
- 7.2 DOC's submission (submission #166) relates to wetlands, indigenous fish, ecological management plan requirements, and impacts to avifauna (some of these matters are addressed by Ms Banhidi and Ms Sievwright). Subsequently, and following a pre-hearing meeting with DOC representatives that I attended on 9 May 2025, Helios and DOC have reached agreement on proposed conditions of consent relating to ecological matters, and this is reflected in the updated draft condition set (as attached to Ms Banhidi's evidence). There are no outstanding matters in DOC's submission to address within my expertise.
- 7.3 The submission of Kā Rūnaka (#71) also addresses wetlands, seeking that conditions set out minimum requirements for the Wetland Enhancement Plan volunteered by condition of consent. I understand that those matters have been addressed in discussions between Helios and Kā Rūnaka, and that agreements reached are reflected in updated draft conditions.
- 7.4 The submissions of Renee Katie Weir (#72), Ann Potter (#118), and Sarah Dunckley (#165) each generally highlight the ecological value of wetlands, the extent of their historic loss (locally and nationally), and seek that wetlands at the Site are adequately protected. I agree with these points and note that my

evidence describes how impacts to wetlands were thoroughly surveyed and assessed, are fully avoided by the proposal, and (for the central and southwest wetland) are to be destocked and enhanced. The limited use of HDD in one location beneath the central wetland (which is questioned by Renee Katie Weir) has been proposed to avoid any need for surface earthworks in wetlands, and in my view, this is a preferable approach to trenching. This is described in Ms Banhidi's and Mr Schlichting's evidence. Overall, I consider that the condition and ecological values of the central and southwest wetland will be improved by implementation of the Wetland Enhancement Plan, compared to the current situation (and this is agreed in the CODC peer review).

- 7.5 Sarah Dunckley's submission also queries wetland setback distances, stating that 20 m is a more standard distance for works setbacks under the RMA, and noting that a greater setback would better prevent material entering the wetlands (e.g. if panels become damaged). I have described some factors that informed wetland setback distances for the Project in Paragraph 6.11, and this is also addressed in Ms Banhidi's statement of evidence.
- 7.6 Kristina Wills (#74) and Sarah Dunckley also raise general concerns about impacts to wildlife, including insects. Indigenous fauna matters are addressed in the EclA, in my evidence, and in Ms Sievwright's evidence. Given the Site's pastoral context and limited indigenous insect habitat, I do not consider effects to indigenous insects to be of any likely ecological concern for this application but provide further comment below in Paragraph 8.7.
- 7.7 Karen Munro's submission (#60) highlights the age of the indigenous shrubs that would be cleared along internal fence lines, and the long time required for replacements to mature. This time lag was identified and addressed in the EclA (Sections 7.1.1 and 8.1.2), which recommends providing at least double the number of plants. The EclA also notes a lack of seedling recruitment, suggesting the persistence of these shrubs at the Site is already tenuous under existing land use. For these reasons, I do not consider this a major impact (see Paragraphs 6.3-6.7), and the proposed plantings sufficiently remedy the loss.
- 7.8 Peter Hore's submission (#101) queries where water will be sourced to develop a new wetland. However, no new wetland habitat will be developed at the Site, and enhancement plantings in the existing central and southwest wetlands do not require additional water.

8. RESPONSE TO SECTION 42A REPORT

- 8.1 I have reviewed the Section 42A Report, including CODC's technical peer review of the EclA report prepared by Mr Wells and colleagues from Wildlands. I note that Mr Wells visited the site and that I have had the chance to discuss the Project with him following his site visit and prior to receiving his peer review.

Matters agreed

- 8.2 In general, the s42A Report and Wildlands peer review are largely in agreement with the EclA. For example, the Wildlands peer review states that "*wetlands and streams appear to have been thoroughly and accurately identified and mapped*" by the EclA (Wildlands 2025, Section 2.4.1) and that Wildlands "*agree there will likely be a net gain level of effect for wetland values at the site*" (Wildlands 2025, Section 2.7.2).
- 8.3 The Wildlands peer review also agrees with the EclA that "*the current proposal would have no adverse effects to waterways*" (Wildlands 2025, Section 2.7.6); and importantly that "*overall, terrestrial vegetation and habitats, wetlands, and avifauna were well-considered with appropriate management actions recommended*" (Wildlands 2025, Section 4.0).

Primary matters not fully agreed

- 8.4 The two main areas where my conclusions and recommendations diverge somewhat from those of Mr Wells' / Wildlands' peer review and / or the s42A officer Mr Vincent's report are:
- (a) whether 5 m setbacks for the 'small wetlands' are ecologically appropriate, or whether this should be 10 m; and
 - (b) whether there is a need for additional survey for additional indigenous plant species, in particular 'spring annuals', due to limitations posed by the fact that one of the ecological surveys occurred during the winter season.
- 8.5 In relation to wetland setbacks:
- (a) My views regarding appropriate wetland setbacks from an ecological perspective are set out in paragraph 6.11 of my evidence above.
 - (b) The s42A Report (at Paragraph 66) and peer review report categorise the Project shaping process I participated in as a simple trade-off between ecological outcomes and economics (essentially,

the number of solar panels that could be installed on Site). I understand this concern may have arisen due to the following statement in Section 3.0 of the EclA: “*blanket application of 10 m setbacks was considered, but would reduce the potential build area of the Solar Farm*”. To clarify, at no point were ecological outcomes traded off by this process. What was primarily considered was whether triggering additional Regional Council consents (e.g. by undertaking earthworks within the National Environmental Standards for Freshwater 2020’s 10 m consent trigger, which is outside of this current consent application) would be a better outcome for this Project than altering the solar farm layout to achieve compliance with all the various permitted activity standards sought by a range of planning instruments. From the outset, the setbacks were based on avoiding adverse effects to wetlands.

- (c) I also highlight that the peer review does not appear to state 10 m setbacks are required from all wetlands. It states: “*we recommend considering a 10-metre setback from wetlands on site, at least for some of the larger wetlands while noting that this is not a statutory requirement in this instance. It is also noted that 10-metre setbacks are already proposed for the largest two wetlands, which is appropriate*” (Wildlands 2025, Section 2.3).
- (d) Further, as I have already stated in relation to ecological outcomes, there are no adverse effects to the ‘small wetlands’ from implementing a 5 m setback, and there are no benefits in implementing any greater setback. I also re-emphasise the point that what surrounds the (largely exotic) wetland vegetation is merely exotic pasture grass of no ecological value (see Figure 1). I therefore reiterate that 5 m setbacks are in my view ecologically appropriate for the ‘small wetlands.’

8.6 In relation to ‘spring annual’ plants and seasonality of surveys:

- (a) The term ‘spring annuals’ refers to a small group of generally rare, cryptic (tiny and hard to spot) indigenous plant species. It commonly means three species: *Myosotis brevis* (a forget-me-not), *Myosurus minimus* subsp. *novae-zealandiae* (NZ mousetail), and *Ceratocephala pungens* (a buttercup relative). They complete their

life cycle from germination to seeding within a few weeks / months in spring to early summer.¹²

- (b) All three species mentioned are nationally classified as Threatened and typically require open, disturbed bare ground, and other specific habitat conditions (such as thin and / or saline soils) that mean that they can persist without being outcompeted by exotic vegetation (especially grasses). Given the Site's intensive pasture use and very limited bare ground, I consider their presence is very unlikely. Of the three, NZ mousetail is the most plausible due to its preference for habitats such as tarn margins or seasonally damp depressions. Based on site conditions, any occurrence would likely be confined to wetland margins or seasonally damp areas.
- (c) Wetlands, their margins, and other seasonally damp areas were the precise areas targeted for survey during the October 2023 vegetation survey, undertaken by my colleague Cara-Lisa Schloots (October is a suitable time to observe these species). In discussion with Ms Schloots in preparation of this evidence, she confirmed that she had spring annuals in mind when conducting her survey, but observed none (Cara-Lisa Schloots, Ecologist, Boffa Miskell, *pers. comm.* 2025). Ms Schloots advised me that she did not recall seeing any suitable habitat for spring annual species during her survey outside of wetlands (or suspected wetlands), but she acknowledged that she would have been unlikely to see any (very small) plants such as NZ mousetail whilst walking or driving more widely across the site.
- (d) Given the very low chance of spring annuals being present, and that any occurrence would most likely be within the protected setback areas around the wetlands, the potential for adverse impacts in my view is remote. I also do not consider an additional survey would be likely to identify any other important indigenous species (i.e., other than spring annuals) compared to the June and October 2023 surveys that have already taken place. Therefore, the additional survey proposed in draft condition 22 of the s42A Report is unnecessary as it would be very unlikely to prompt any changes to the existing ecological impact management approach.

¹²

For example, see: Rogers, G., Walker, S., Tubbs, M., Henderson, J. (2002). Ecology and conservation status of three "spring annual" herbs in dryland ecosystems of New Zealand. *New Zealand Journal of Botany*, 40:4, 649-669; Rogers, G., Overton, J. McC., Price, R. (2007) Land use effects on "spring annual" herbs in rare non-forest ecosystems of New Zealand. *New Zealand Journal of Botany*, 45:2, 317-327; and Barkla, J. (2022). "Spring annuals in Central Otago." In *Trilepidia* (Newsletter of the New Zealand Plant Conservation Network) No. 222, September 2022.

Other matters not fully agreed

8.7 Where there are other slight differences in opinion between the EclA and the peer review, e.g., regarding the presence of lizard habitat and invertebrate habitat at the Site, in my view any actual differences of opinion are relatively immaterial to the effects assessment outcomes. I respond to them for completeness and consider that they arise largely because the peer reviewers and I took a slightly different approach:

- (a) The peer review identified a small area of lizard habitat along an internal shelterbelt and shrubland of potential habitat value for invertebrates in the northeast of the Site. The peer review notes both areas lie outside the proposed development footprint. My survey was guided by a preliminary design, which already avoided these areas. As such, I placed less emphasis on them in the EclA. The EclA's statement (Section 5.4) that "*no lizard habitat was identified on Site within the solar farm footprint*" remains accurate.
- (b) The slight difference in approach also applies to terrestrial invertebrates. Wildlands misrepresent the EclA somewhat where they argue (at their Section 2.4.3) "*the [EclA] states that no habitat is available on-site for terrestrial invertebrate assemblages.*" In fact, the key point of the EclA (at Section 4.8) is that "*it is highly unlikely that any indigenous terrestrial invertebrate species or communities are present that would be subject to adverse effects requiring specific impact management responses*" (my emphasis). In essence, this is because most of the Site, being exotic pasture, will remain as such. While indigenous shrubs provide important invertebrate habitat (generally speaking), those within the Site are isolated and do not represent functioning shrubland communities (and many are highly damaged by grazing). Better habitat on Site boundaries will be retained, and hence, invertebrates were considered of low concern in the EclA. In my view, and as agreed in the s42A Report, proposed indigenous planting, despite time lags, adequately remedies any minor habitat loss.

9. RECOMMENDED CONDITIONS

9.1 In response to matters raised by submitters regarding ecological impacts and management plans, the applicant has provided updated conditions of consent attached to the statement of evidence of Ms Banhidi.

- 9.2 The applicant's updated condition set includes my recommendation to plant at least double the number of indigenous shrubs that would be cleared within the Site. It also includes my recommendation to undertake wetland enhancement via a Wetland Management Plan.
- 9.3 Referring to draft consent condition 15 proposed in the s42A Report (wetland setbacks), whilst I expect that the s42A reporting officer's intention reflects that no Regional Council consents have yet been sought, from an ecological perspective I reiterate that I consider 5 m setbacks would adequately avoid adverse effects and would appropriately protect the 'small wetlands' at the Site.
- 9.4 As I have explained in Paragraph 8.6(d), I do not consider that the additional indigenous vegetation survey proposed in draft consent condition 22 of the s42A officer's report is necessary. I agree with Ms Banhidi that this condition should be deleted as reflected in the updated condition set that accompanies her evidence.

10. CONCLUSION

- 10.1 Vegetation clearance to construct the solar farm would primarily affect exotic pastures used for sheep and beef grazing of negligible ecological value. Impacts arising due to clearance of matagouri, desert broom, porcupine shrub, and scrub pohuehue shrubs can be appropriately managed (remedied) with no residual impacts at the Site scale in the long term.
- 10.2 All wetlands at the Site would be fully avoided by proposed works, with appropriate setback distances applied. Because adverse effects of the proposal relating to wetlands and indigenous shrubs would be avoided and minimised respectively, and residual losses of shrubs would be remedied, there is no requirement for other ecological mitigation, offset, or compensatory measures. Long term, fencing and enhancement of the 'central' and 'southwest' wetlands represents a net gain in terms of the significant wetland values at the Site.

Dr Jaz Nye Morris
21 July 2025

Attachment 1 – Vegetation Map

