

**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 substation and transmission line
infrastructure for renewable electricity generation at
48 Ranfurly-Naseby Road, Naseby ("**Project**")

**STATEMENT OF EVIDENCE OF HAMISH ROBIN DENIZE
ON BEHALF OF HELIOS**

21 JULY 2025

1. EXECUTIVE SUMMARY

- 1.1 This statement of evidence is given in respect of the resource consent application 240351084 by Helios OTA OP LP ("**Helios**") for the proposed solar farm ("**Project**") at 48 Ranfurly-Naseby Road, Naseby ("**Site**"). I was engaged (through my employer Beca Limited "**Beca**") to provide fire risk commentary and advice into the development of fire risk mitigations¹.
- 1.2 A range of fire risk mitigations have been adopted by Helios and developed into practicable proposed consent conditions by Helios and its team of consultants. These fire risk mitigations include:
- (a) appropriate certifications and design standards for electrical components;
 - (b) fire risk management plans for the construction and operation stages of the solar farm;
 - (c) a Fire Emergency Response Plan;
 - (d) firefighting facilities including water and accessibility (including a new perimeter access track which improves firefighting access and resists fire spread);
 - (e) limiting the flammability of the vegetation.
- 1.3 Fire and Emergency New Zealand ("**FENZ**") has been consulted by Helios throughout the development of the Project to date and was provided a draft version of the proposed fire risk mitigations. Their firefighting advice has been incorporated into the proposed mitigations. FENZ has confirmed that the process for certification of the fire risk management plans (including Fire Emergency Response Plan) proposed by Helios is an appropriate approach.
- 1.4 The proposed fire risk mitigation measures reduce the probability of fires (and their preceding conditions) occurring, via compliance with electrical standards and fire risk management plans. The proposed fire risk mitigation measures also reduce the potential consequences of a fire, if one were to occur, through resistance to grass fire spread provided by the network of internal and perimeter gravel access tracks, facilities for firefighting intervention and Fire Emergency Response Plan.

2. INTRODUCTION

2.1 My full name is Hamish Robin Denize. I am a Technical Director and Beca Technical Fellow in the Fire Engineering discipline with Beca Limited (**Beca**).

2.2 I have the following qualifications relevant to my evidence:

- (a) Master of Engineering (in Fire Engineering) from the University of Canterbury 2000; and
- (b) Bachelor of Engineering (in Mechanical Engineering, honours) from the University of Canterbury 1999;
- (c) I am a current Chartered Professional Engineer ("CPEng") and member with Engineering New Zealand. I am also a current CPEng and member with Engineers Australia;
- (d) I am the current Vice-president of the New Zealand Chapter of the Society of Fire Protection Engineers.

2.3 My experience relevant to the Project includes:

- (a) I provide consulting engineering services to a range of private, local and central government clients throughout New Zealand and overseas.
- (b) I have been a fire engineering consultant in the above capacity for over 20 years practising throughout New Zealand, and prior to that, 4 years in Australia. The majority of my work involves leading and overseeing fire engineering assessments for special fire risk hazards, buildings and industrial sites.
- (c) This work typically involves fire assessments against Building Act and Code criteria or client risk profile criteria, achieved through bespoke fire risk assessments, design and construction observation of fire risk mitigation measures. This information is typically used by New Zealand Councils (in their Building Consent Authority "BCA" capacity) and clients to identify and implement fire mitigation measures. I also provide policy and training to Council BCA teams and have acted as the Ministry of Business, Innovation and Employment ("**MBIE**") independent expert for Building Act determinations.

- (d) In 2024 I provided Environment Court evidence on a similar utility scale solar farm facility near Greytown, in the South Wairarapa District. Prior to this I had led a comprehensive fire risk assessment, literature review and developed fire risk mitigations for that solar farm site.
- (e) I have also worked on other power generation facilities (mostly geothermal) and carried out plant and electrical system fire risk assessments, to develop fire risk mitigation measures meeting the owner's risk profile and Building Code. I have also worked directly for Transpower on various electrical resilience studies and was engaged to enhance their 2023 "Substation Fire Mitigation Design Standard". Increasingly, the building projects I work on have solar panels installed on their roofs. I have worked on small to large electrical infrastructure projects, transformers and substations.
- (f) Separate to Beca employment, I was raised on a sheep and beef farm and together with my brother, we currently run a dry-stock and several dairy farms. On my home lifestyle block, I have dry-stock and an avocado orchard with boundary shelter belts. I have been involved in multi-hectare scrub burn-offs and frequently burn shelter belt trimmings. The reason for mentioning this is because I have 'on farm' experience.

Involvement in the Project

- 2.4 I have been involved with the Project since May 2025. My involvement has included being briefed on the proposed Project by Helios and Boffa Miskell, the Landscape Architects for the Project. I was engaged to provide fire risk and contamination commentary, and input into the development of fire risk mitigations² by Helios and their consultants, including proposed consent conditions.
- 2.5 I led the preparation of the Fire Risk Mitigations and Commentary report ("the **Report**") submitted to Central Otago District Council ("**Council**") in July 2025³. Under my direction, my Beca team colleagues consulted with FENZ on 10 July in addition to previous engagement between Helios and FENZ.
- 2.6 I will have visited the proposed Project site ahead of the hearing.

² Fire Risk Mitigations and Commentary Report, Māniototo Plain Solar Farm, dated 2 July 2025.

³ Fire Risk Mitigations and Commentary Report, Māniototo Plain Solar Farm, dated 2 July 2025.

Code of conduct

- 2.7 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.

3. SCOPE

- 3.1 This evidence is given in respect of the resource consent application by Helios for the proposed new solar farm at 48 Ranfurly-Naseby Road, Naseby ("**Site**"). In my evidence I will cover the following:
- (a) An overview of solar farm electrical components in relation to fire;
 - (b) An overview of the fire risk mitigations to be implemented in detailed design, procurement, construction and operational stages;
 - (c) Commentary regarding potential contamination of air, soil and groundwater, relative to the surrounding rural context;
 - (d) Response commentary to submissions which include solar farm fire risk themes.
- 3.2 In development of the recommended conditions, I have depended on the advice of others, including Boffa Miskell⁴ and Helios, for what is considered practicable in order to balance the various objectives e.g. landscape and fire risk objectives for screen planting selection.
- 3.3 FENZ was consulted during the development of the recommended fire risk mitigation conditions and their firefighting advice and local experience was relied upon.

⁴ In regards to conditions related to landscape matters (eg: plant species survivability).

4. SUMMARY OF FIRE RISK COMMENTARY AND MITIGATIONS

Overview of Electrical Component Fire Hazards

- 4.1 I was briefed on the Project and its electrical components by Helios, including the design features, certifications and design standards of these components. The fire hazard aspects of the electrical components are provided in Section 2.1 of the Report⁵ and are summarised below.
- 4.2 The photovoltaic (“**PV**”) solar modules will be bi-facial, meaning that the solar cells are sandwiched between two layers of toughened glass within an anodized aluminium frame. The PV cells are embedded with an encapsulant material (typically Ethylene Vinyl Acetate (“**EVA**”)) providing electrical insulation, support and protective functions and is the significant combustible component in bi-facial PV modules. The EVA layer is very thin (approximately 0.5 mm), enclosed within the two layers of glass and Helios have also confirmed that the PV modules will be certified to Fire Class C or higher following IEC 61730, AS/NZS 5033 or equivalent international standard.
- 4.3 The PV solar modules are connected to string combiner boxes via direct current cables. The DC cables will be certified to IEC 62930 and combiner boxes will include voltage surge protection, internal isolation mechanisms, will be out-door rated and designed to prevent condensation.
- 4.4 The combiner boxes are connected to inverters by underground cables which convert direct current electricity generated by the solar panels to alternating current electricity. The inverters will be contained in prefabricated enclosures, distributed within the Site, away from Site shared boundaries and installed on a hardstand area (e.g, gravel). The inverters will comply with IEC 62109-1. This standard contains requirements for “protection against fire hazard” and that the in-built detection and fire risk prevention systems within the inverters include thermal monitoring, a ground fault detection system, over voltage detection, over current detection and circuit breakers⁶.
- 4.5 The on-site substation will contain electrical equipment that steps up the voltage from the 33 kV of the inverters to 220 kV required for the national grid. The substation will be designed to meet Transpower’s “Substation Fire Mitigation Design Standard”⁷. This standard contains comprehensive fire risk mitigations including spatial setbacks and firefighting provisions. There are

⁵ Fire Risk Mitigations and Commentary Report, Mānīototo Solar Farm, dated 2 July 2025.

⁶ Section 2.1.1, Fire Risk Mitigations and Commentary Report, Mānīototo Solar Farm, dated 2 July 2025.

⁷ Transpower reference TP.DS 61.06, October 2023.

numerous Transpower and utility substations located throughout New Zealand, many in similar rural contexts (such as the existing substation on Fennessy Road).

Overview of Fire Contamination Commentary

- 4.6 The products of all fires are toxic to some degree. A range of fires are possible in the existing rural context including vehicles (e.g. ute, tractor), buildings (e.g. house or farm shed) and wildfires involving grass or tree fuels. The common products of combustion are water vapour, carbon (soot), carbon monoxide and carbon dioxide. There are numerous other products of combustion that depend on the type of fuel and the fuel-air ratio. Hydrocarbon fuels (e.g. plastics) generally produce a range of toxins not typically present when cellulosic fuels burn (e.g. vegetation).
- 4.7 The toxicity of a solar farm fire is difficult to predict with any real certainty, given it is totally dependent on what is burning. It could involve electrical components (e.g. inverters), vegetation or both. However, given the electrical components are dispersed and/or spaced, and given the similar fuels (e.g. plastics and hydrocarbon oils/fuels), toxicity levels from a burning electrical component could be expected to be similar to that which would be produced from a vehicle, tractor, house or farm building fire in the surrounding rural context.
- 4.8 All fires produce toxic products which can be dispersed through air, by water and over the ground. A range of fire risk mitigations have been developed (e.g. monitoring, on-site firefighting water and access, fire risk mitigation plans, etc), which are not present in the surrounding context and allow improved firefighting intervention and suppression. Furthermore, the Operational Fire Risk Management Plan will include provisions for remediation after a fire event.

Fire Risks Associated with Solar Farms

- 4.9 The Report⁸ considers the findings of the 2018 study by the Building Research Establishment on “Fire and PV Systems”. This study presents data indicating that ground-mounted solar farms experience a low rate of fire incidents, particularly when component quality and construction standards are adhered to and systems are monitored by an operational and maintenance contractor.

⁸ Fire Risk Mitigations and Commentary Report, Māniototo Solar Farm, Beca Limited dated 2 July 2025.

- 4.10 Farmland and the surrounding rural context have many different permitted uses and activities, meaning there is a spectrum of inherently accepted fire risk in the Site's surrounding rural context.
- (a) An example on the lower end of the fire risk spectrum would be two neighbours who may have their properties separated by a simple boundary stock fence and both have low height pastoral grass either side with infrequent farm machinery activity as an ignition source.
 - (b) An example on the higher end of the fire risk spectrum would be neighbours who have unmaintained shelterbelts or trees close to, or overhanging across property boundaries, with frequent farming machinery used (eg: haylage or hay making in dryer summer months).
- 4.11 It is often impracticable, unfunctional or uneconomic to eliminate all potential risk (in this case, the risk of fire). Rather, mitigations which reduce either the probability or consequences can be implemented to reduce the risk.
- 4.12 The construction and operation of a solar farm can represent an elevated risk since, at a minimum, new potential ignition sources are introduced to the Site. However, a fire is a highly undesirable event for the proposed Project and fire risk reduction mitigations are to be adopted in the form of design features inbuilt within the solar farm and a suite of Project specific fire risk management plans so that the probability of fires and/or the likely consequences are reduced.
- 4.13 Considering the design layout and electrical component standards, I consider the greatest credible fire risk resulting from the Project would be as a result of vegetation on Site (e.g. grass or existing/new boundary vegetation maintained for visual screening). This is because vegetation forms the most abundant and continuous fuel source which is in close proximity to any potential solar farm ignition source.
- 4.14 A range of fire risk mitigations to address the potential fire risk from the Project are outlined in the following sub-sections and detailed in the recommended conditions.

Overview of Fire Risk Mitigations

- 4.15 The Project will include twelve 25,000 litre water tanks exclusively for firefighting purposes⁹ which is based on FENZ's firefighting advice to Helios prior to my involvement¹⁰. The final details including tank locations, couplings and hardstands will be approved by FENZ as part of a recommended condition.
- 4.16 A perimeter access track is to be provided, in addition to the network of internal access tracks. This can resist fire spread and allow firefighting appliance access around the Site. The track will be constructed of gravel material with a minimum four metre width plus a two metre grassed buffer on either side to allow for additional setback between the perimeter planting and the Project infrastructure. The access tracks including the full perimeter access track is shown in the amended layout attached to the evidence of Mishka Banhidi (Planning). The inclusion of the full perimeter access track was supported by FENZ at the July 2025 meeting.
- 4.17 New plants and trees introduced as part of the proposed planting plan for the Project shall have regard to plant flammability, particularly towards those with lower flammability. Boffa Miskell have recommended practicable limits on proportions of plant flammability which considered my recommendation for plants with lower flammability while meeting landscaping requirements such as screening height, density and adequate survivability in the environment (refer to the recommended condition list in Section 7).
- 4.18 Vegetation on Site should be maintained and managed to remove dead branches and maintain the height and width of vegetation, avoiding the potential accumulation of fuel.
- 4.19 Grass height should also be maintained so it does not exceed an agreed height, to limit the severity of a potential grass fire. While much of this may be achievable by grazing, supplementary mechanical mowing will be required which Helios has advised will be the responsibility of the Operational and Maintenance contractor appointed for the Project which will maintain a regular local presence on Site to carry out this function.
- 4.20 A detailed set of management plans will be developed prior to construction to appropriately address fire risks at all stages of the Project¹¹, namely:

⁹ See Section 3.1 of the Assessment of Environmental Effects dated 26 June 2025 for a description of the water tanks and the Site Layout attached to the evidence of Mishka Banhidi (Planning) for the location of the water tanks.

¹⁰ Number of water tanks discussed and agreed at meeting on 8 August 2023 between Helios and FENZ. Meeting attendees advised by Helios were James Knapp (FENZ), Bobby Lamont (FENZ), Louise Armstrong (FENZ Representative for Planning), Lydia Shirley (FENZ Representative for Planning), Jackson White (Helios), Sabrina Young (Helios).

¹¹ Refer to the recommended conditions for the specific wording recommended to capture the intent of the Management Plans.

- (a) Construction Fire Risk Management Plan;
- (b) Operational Fire Risk Management Plan;
- (c) Fire Emergency Response Plan.

Consultation with FENZ

- 4.21 Prior to my involvement with the Project, Helios had already undertaken consultation with FENZ ¹².
- 4.22 Under my direction, my Beca colleagues Paul Horne and Kevin Weller met with senior representatives of the FENZ Otago District on 10 July 2025¹³. The purpose of this meeting was:
- (a) To provide an update on the Project;
 - (b) To discuss the Report which had been shared with FENZ and answer questions or address any feedback;
 - (c) To discuss the proposed fire risk mitigations as outlined in paragraphs 4.15 to 4.20 of my evidence;
 - (d) To confirm the timings and process for certification of the fire risk management plans.
- 4.23 Based on the discussion at this meeting, it was understood by Beca and Helios attendees that the proposed fire risk mitigations of a perimeter track designed to provide for manoeuvrability of firefighting appliances, managing pasture height, provision of water tanks with couplings on hardstand areas and prioritising low flammability planting aligned generally with FENZ's expectations. Helios and Beca requested FENZ confirmation that the approach to management plans conditions was agreed (i.e. that plans are provided to FENZ for feedback prior to construction). FENZ has provided written agreement to the wording of the condition relating to the certification of the management plans. This email correspondence is provided as **Attachment 1** to my evidence.

¹² Refer to the Corporate Evidence of Helios's Jeffrey Schlichting.

¹³ Online meeting attendees: Paul Horne (Beca Limited), Kevin Weller (Beca Limited), Sarah Brooks (Helios), Sam Vivian (Helios), James Knapp (Senior Advisor, Risk Reduction, FENZ) and Bobby Lamont (Group Manager, Central Otago, FENZ).

5. RESPONSE TO RELEVANT SUBMITTERS

- 5.1 I have read the submissions on the project which relate to fire risk and address the key themes below¹⁴.
- 5.2 Submission 128 raises various topics in relation to fire risk. Given its length and range of topics raised relevant to the matter of fire risk that were also raised by other submissions, the Report¹⁵ contains a more detailed commentary on topics raised by Submission 128.

Fire risk generally

- 5.3 There are a number of submissions which make general statements regarding fire risk but are not clear on their specific source of concern¹⁶. I refer to Section 4 of my evidence and relevant Section 2 of the Report¹⁷ which speak generally to fire risks relating to solar farms. It is important to highlight that a range of information is provided in submissions, but only those relevant to the Project should be considered (eg: matters which are not considered further include rooftop solar fires and any matters related to Battery fires).
- 5.4 A number of submissions generally assert that solar farms present an increased fire risk. Risk is defined as a combination of probability and consequences. Fire risks are present in the existing and surrounding Site context. The range of mitigations proposed for the Project reduce both the probability and consequence components of fire risk. The probability component is reduced by factors such as design and component compliance with relevant standards, quality of installation and ongoing maintenance and monitoring of the Project. The consequence component is reduced through measures intended to reduce fire spread and facilitating firefighting intervention. These measures include the introduction of dedicated firefighting water stored onsite, a network of internal access tracks, and the perimeter access track which will resist fire spread.

¹⁴ For completeness I note that submissions which speak only to the fire risk related to Battery Energy Storage Systems (BESS) have not been considered in this evidence. Submissions which speak to a general concern regarding fire risk have been included in the response to submitters.

¹⁵ Appendix A, Fire Risk Mitigations and Commentary Report, Mānīototo Solar Farm, dated 2 July 2025.

¹⁶ Submissions 20, 21, 24, 25, 26, 27, 38, 43, 48, 49, 55, 67, 79, 84, 85, 94, 95, 99, 109, 111, 122, 124, 127, 134, 136, 141, 144, 152, 153, 173, 176.

¹⁷ Appendix A, Fire Risk Mitigations and Commentary Report, Mānīototo Solar Farm, dated 2 July 2025.

Flammability of components

- 5.5 A number of submissions speak to flammability of solar panels, inverters or 'components' generally¹⁸. I refer to Section 4 of my evidence and the Report¹⁹ which discuss these matters.

Fire risk from the local environment

- 5.6 Many submissions mentioned the inherent fire risk of the local environment the Site is located within, including low rainfall and high winds which could make firefighting efforts difficult. Further submissions raise concerns the volunteer fire brigade do not have the equipment or training to respond to a fire on the Site²⁰.
- 5.7 The Project will include a range of mitigations which facilitate firefighting intervention which would reduce effects of fire (e.g. extensive Site access for firefighting vehicles and on-site water storage with locations to be agreed with FENZ during detailed Project design).
- 5.8 Proposed conditions of consent will also require the provision of detailed fire risk management plans through Project construction and operational periods, and in the event of a fire emergency. Each plan will take into account detailed design and specific component selections and will include significant input from the lead contractor (for construction) and operational and maintenance contractors (for long-term operation) appointed to the Project. Site familiarisation for FENZ has also been included in the recommended conditions.

Fire risk from grass on Site

- 5.9 Submissions speak to possibility of long grass on the Site creating a heightened fire risk²¹. Once the Project is operational, grass shall be maintained at an agreed height via a combination of sheep grazing and mechanical mowing by the Project's operational and maintenance team, to limit the potential for grass fire severity²².

¹⁸ Submissions 35, 45, 60, 128, 149, 162.

¹⁹ Fire Risk Mitigations and Commentary Report, Mānīototo Solar Farm, dated 2 July 2025.

²⁰ Submissions 7, 26, 27, 64, 73, 74, 79, 80, 100, 107, 120, 125, 126, 129, 134, 153, 154.

²¹ Submissions 41, 73, 151.

²² The grass height will be reviewed by FENZ and included in the Operational Fire Risk Management Plan to be certification by Council.

Fire risk created by sunshine causing overheating of components

- 5.10 Submission 60 raises concerns that the sun could overheat the inverters. Submission 32 states panels could reach high temperatures and cause a grass fire. Main electrical equipment is designed for an operational temperature range anticipated for the site. Inverters have control systems to shut-off when the overheat temperature is exceeded. CCTV monitoring allows for remote identification and notification of a fire event.

Contamination in the event of a fire on Site

- 5.11 A number of submissions express concerns about potential contamination from fire, particularly of the aquifer or toxic gases released to the air²³.
- 5.12 I refer to Section 4 of my evidence and the Report²⁴ which discusses these matters. The potential toxicity of a fire on a solar farm site is difficult to predict with any certainty, given it is totally dependent on where the fire is located and what might actually be on fire (e.g. solar components, vegetation or both). Toxicity levels from an electrical component like an inverter which caught fire could be expected to be similar to that which would be produced from a vehicle, tractor, house or farm building fire in the surrounding rural context.
- 5.13 Furthermore, the Project design and components incorporate various fire risk mitigations (e.g. monitoring remotely, on-site firefighting water and access, fire emergency response plans, etc), which are not present in the surrounding rural context, given it is mostly farming operations. The Operational Fire Risk Management Plan will include provisions for remediation after a fire event.

6. RESPONSE TO SECTION 42A REPORT

- 6.1 I have reviewed paragraphs 101 to 106 of the Central Otago District Council Section 42A Report²⁵, which relate to risks of fire, and comment below.
- 6.2 Regarding paragraph 101, the Council Officer states it is not advised to use water where there is a risk of electrical charge present.
- 6.3 The specific firefighting actions taken at any event are based on a dynamic risk assessment undertaken by the FENZ incident commander. Therefore, design for firefighting purposes consists of providing facilities (access, water, etc) that

²³ Submissions 38, 41, 60, 66, 78, 100, 115.

²⁴ Fire Risk Mitigations and Commentary Report, Māniototo Solar Farm, dated 2 July 2025.

²⁵ Central Otago District Council, Section 42A Report, 7 July 2025.

give firefighters a range of response options to consider in their dynamic risk assessment. FENZ is a member of the Australasian Fire and Emergency Service Authorities Council (AFAC), which “develops doctrine to support the practice of emergency management”. A Fire Emergency Response plan is part of the recommended conditions and includes attendance of a site representative to manage electrical hazards for firefighting. The AFAC guideline “Incidents involving PV array and battery energy storage systems”²⁶ states that *“It is safe to use fresh water ... as an extinguishing medium for direct application to a PV or BESS system, regardless of whether it is live or not. A broken spray pattern should be used from a distance of at least six metres from system components or adjoining conductive material.”* Therefore, although the specific firefighting actions in a fire are the result of a dynamic risk assessment by the FENZ incident commander, the provision of firefighting water onsite provides suppression options for both vegetation and potentially electrical fires.

- 6.4 Regarding paragraph 103 about vegetation control, I agree that while the grass height can be maintained in much of the farm by grazing, mechanical and other supplementary methods will be required. One of the recommended conditions, the Operational Management Plan, will include how the grass height will be managed and who is responsible for this²⁷.
- 6.5 In Paragraph 106, the Council Officer requests that draft management plans are provided at or prior to the hearing. The justification provided is that the Council Officer acknowledges that the Council would defer to FENZ in relation to fire management but also does not want to create ultra vires conditions. The proposed fire risk mitigation plans depend on information and parameters that will be refined in the detailed design stage, when the lead construction contractor has been appointed, specific component selections made, and the operational and management contractor can be consulted.
- 6.6 To address the Council’s concerns, I recommended a consent condition that the fire risk mitigation plans be submitted to FENZ for review and comment. Revised versions of these plans incorporating FENZ feedback can then be provided to the Central Otago District Council for certification. This approach was a key item discussed at the meeting with FENZ on 10 July 2025 and agreed via email on 17 July 2025. This email correspondence is provided as **Attachment 1** to my evidence.

²⁶ Australasian Fire and Emergency Service Authorities Council, Doctrine ID:3020, 4 November 2020.

²⁷ Refer to the evidence of Helios’s Jeffrey Schlichting (Corporate) for details on Operation and Maintenance of the Project.

7. RECOMMENDED CONDITIONS

- 7.1 The proposed conditions in the Section 42A Report²⁸ contained a placeholder (Paragraph 30) for any fire management conditions. I have been involved in the development of the following fire risk mitigation proposed conditions with Helios. I support the conditions as worded below and consider they provide for practicability, considering my fire risk mitigation advice, and consultation with FENZ on firefighting advice.

Condition [x]: Approval of Fire Risk Management Plans

A minimum of eight (8) weeks before the activity commences (excluding any enabling works such as geotechnical investigations, piling tests and site surveys), the consent holder must submit to the Planning Manager, Central Otago District Council, for their approval, the following plans ("**Fire Risk Management Plans**"):

- (a) Construction Fire Risk Management Plan;
- (b) Operational Fire Risk Management Plan; and
- (c) Fire Emergency Response Plan.

These plans shall first be provided to FENZ, for review and comment, and any comment(s) received shall be addressed prior to submitting to Central Otago District Council for certification.

Condition [x]: Construction Fire Risk Management Plan

During construction of the solar farm, activities on-site shall comply with the provisions of the Construction Fire Risk Management Plan and the relevant provisions of the Fire Emergency Response Plan.

The Construction Fire Risk Management Plan shall be prepared by a suitably qualified and experienced person, which:

- (a) Identifies reasonably foreseeable on-site fire risks that could occur at the Site during construction;
- (b) Identifies appropriate fire risk control measures to safely mitigate the identified risks;

- (c) Prioritises the sequence of fire risk mitigations early into the construction works, including consideration of Site access for emergency vehicles, access tracks construction and filling of the firefighting water storage tanks.
- (d) Confirms the selected electrical components meet the following requirements. PV modules are of the bi-facial toughened glass type and conform to an IEC 61730 Class C fire classification or AS/NZS 5033 or an equivalent international standard. Inverters shall comply with IEC 62109 or an equivalent international standard.
- (e) Sets out the required quality controls on the procurement and installation of all key equipment, including PV modules and inverters, considering manufacturers' and contractors' history of fire safety, long-term operational reliability and compliance with relevant industry standards on comparable utility-scale solar projects.
- (f) Documents the final layout of the 4 m wide internal and perimeter gravel access tracks shown on Mānīatoto Plain Preliminary Layout dated 08/05/2025 and demonstrates the geometry of non-straight sections of these access tracks comply with the wider turning requirements for aerial appliances in Fire and Emergency New Zealand "Emergency Vehicle Access" (F5-02-GD, 10 December 2021). The access tracks shall be able to withstand a laden weight of up to 25 tonnes with multiple axels spaced at no less than 2.5 m centres and each carrying 8.2 tonnes. The perimeter access track shall have at least 2 m grassed buffer on either side to allow for additional setback between the perimeter screen plantings and the Project infrastructure.

Note: It is not intended that an aerial appliance be involved in firefighting. Rather, following FENZ advice, the geometrical requirements for an aerial appliance have been referenced to provide allowance for water tankers. This access condition does not apply to manoeuvring around water tanks and their associated hardstand areas.

- (g) Details the size, location and details of fire water tanks and hardstands capable of accommodating a fire appliance and are located off access tracks and at an appropriate proximity to coupling(s);

- (h) Includes requirements for signage at the entry to the site which clearly displays the name, telephone number and address for service of the construction manager.
- (i) Includes provisions requiring construction vehicles, excluding motorbikes, quadbikes and visiting vehicles, on the site to be equipped with fire extinguishers, of size and type in accordance with NZS4503 or as recommended by FENZ.

Note: It is expected that operational vehicles which are able to carry a fire extinguisher will do so, including cars, utes, vans, trucks and tractors which have an enclosed cab. It is not practical, and therefore not required, to carry fire extinguishers on smaller vehicles such as motorbikes, quadbikes or side-by-sides. Where fire extinguishers are carried, these are expected to be hand-held and generally expected to be the dry-powder type (Class ABE) which are versatile in responding to most types of fires.

- (j) Include a procedure for a site representative, capable of managing electrical hazards, be available to attend whenever FENZ are alerted to an emergency at the site.
- (k) Two-copies of the construction phase Fire Emergency Response Plan shall be stored on site in a prominent 'Emergency Information Cabinet' located adjacent to the Site's main entry point.

Condition [x]: Operational Fire Risk Management Plan

During operation of the solar farm, activities on site shall comply with the provisions of the Operational Fire Risk Management Plan and the relevant provisions of the Fire Emergency Response Plan.

The Operational Fire Risk Management Plan shall be prepared by a suitably qualified and experienced person, which addresses/provides:

- (a) Contact details of the local Site Representative who is available to attend site in an emergency on a 24 hour, 7 days a week basis;
- (b) Fire water storage tank checks;
- (c) Signage at entries to the Site which clearly display the name, telephone number and address to contact in the event of an emergency.

- (d) Grass height requirements and management. The grass height should be based on the lowest reasonably practicable height achievable by grazing;

Note: Grazing is used to set the reasonably practicable grass height. This grass height limit can be maintained by grazing, mechanical, other means or a combination.

- (e) Access track maintenance;
- (f) Weed maintenance;
- (g) Screen painting and site vegetation maintenance, including maintenance of retained existing trees to their current height and width.
- (h) Solar PV panel and infrastructure maintenance, including monitoring for panel damage and integrity;
- (i) Details of monitoring for faults and potential fires at all times, by a remote control room, including:
 - (i) Key electrical system infrastructure;
 - (ii) Fault monitoring detection system(s);
 - (iii) CCTV system(s) that covers the components of the Solar Farm within the screen planting.
- (j) Requirements for the Site Administration Building, substation switch-room building and any other buildings containing equipment or parts to be monitored at all times by an automatic fire detection and alarm system which incorporate automatic notification to FENZ.
- (k) Details of the fire extinguishers, of size and type in accordance with NZS4503, in the Site Administration Building and substation switch-room.
- (l) Requirements that vehicles, excluding motorbikes, quadbikes and visiting vehicles, on the site to be equipped with fire extinguishers, of size and type in accordance with NZS4503 or as recommended by FENZ.

Note: It is expected that operational vehicles which are able to carry a fire extinguisher will do so, including cars, utes, vans, trucks and tractors which have an enclosed cab. It is not practical, and therefore not required, to carry fire extinguishers on smaller vehicles such as motorbikes, quadbikes or side-by-sides. Where fire extinguishers are carried, these are expected to be hand-held and generally expected to be the dry-powder type (Class ABE) which are versatile in responding to most types of fires.

- (m) Site remediation in the event of contamination as a result of a fire.
- (n) A reinstatement procedure after any electrical equipment is damaged.

The Operational Fire Risk Management Plan shall be reviewed annually from the date the Solar Farm becomes operational. Any amendment arising from this review shall be incorporated in the plan and provided to Central Otago District Council.

Condition [x]: Fire Emergency Response Plan

A Fire Emergency Response Plan (“**ERP**”) shall be prepared by a suitably qualified and experienced person, following the Fire and Emergency New Zealand “Emergency Response Plan Preparation” guide (RD2-1, 20 June 2018), for reasonably foreseeable fire emergencies during the construction and operation of the facility. It shall include a procedure for a site representative, capable of managing electrical hazards, to be available to attend whenever Fire and Emergency New Zealand are alerted to a fire at the site.

Note: The intent of a Fire Emergency Response Plan is to capture the benefits of planning for likely responses to fire emergencies on the Site which contains electrical hazards not frequently encountered by firefighters.

Two-copies of both the construction and operational phase Fire Emergency Response Plan shall be stored on site in a prominent ‘Emergency Information Cabinet’ located adjacent to the site’s main entry point.

Prior to the Project becoming operational, the operator must offer to undertake an onsite meeting with FENZ and if agreed, undertake the site visit to familiarise emergency crews with the site and the ERP. Once the Project is operational, the operator shall offer this onsite FENZ familiarisation meeting every 2 years.

Firefighting Provisions

Twelve 25,000 litre water tanks shall be provided exclusively for firefighting purposes. The tanks shall be filled following installation and refilled after each subsequent take of water has ceased. Each fire water storage tank shall be fitted with a highly visible float indicator so that each tank's water level can be easily observed. Adjacent tanks shall be connected so that water is withdrawn from adjacent tanks. Tanks shall be fitted with fire service coupling(s) following the coupling requirements of SNZ PAS 4509 (only the coupling requirements shall apply). The tank location(s), couplings arrangement and hardstand locations shall be agreed in consultation with the regional risk officer, Fire and Emergency New Zealand.

Components and Construction

The substation shall be designed and operated to comply with the Transpower "Substation Fire Mitigation Design Standard" (Transpower Reference TP.DS 61.06).

At least 10 working days prior to commissioning of the Solar Farm, the Consent Holder must provide Council with written verification from a suitably qualified and experienced engineer confirming that the installed electrical infrastructure has been installed in accordance with good engineering practice and in accordance with the design.

Section 42A Report²⁹ Condition 16: Landscape and Visual Effects Management

1.2 The following updates are requested to Condition 16 to reflect fire risk mitigation measures:

16 (b) (iii) Monitoring and maintenance requirements for weed removal and pest control and removal of dead branches and cuttings from the confines of the Site.

16 (b) (vii) – new addition

The species mix shall satisfy the following proportions of plant flammability according to the Fire and Emergency New Zealand Plant Flammability Directory³⁰:

(a) "very low", "low" or "low/moderate" for no less than 70% of plants;

²⁹

Central Otago District Council, Section 42A Report, 7 July 2025.

³⁰

Accessible at <https://www.checkitsalright.nz/reduce-your-risk/low-flammability-plants>.

- (b) “moderate” or “moderate/high” for up to 20% of plants;
- (c) “high” for up to 10% of plants; and

Plants classified with a flammability of “moderate” or greater shall be separated from other plants of “moderate” or greater flammability by their expected mature height.

8. CONCLUSION

- 8.1 The proposed conditions incorporate a range of Project specific fire risk mitigation measures which have been developed to be practicable and incorporate FENZ’s firefighting advice.
- 8.2 When implemented, these measures reduce both a.) the probability of fires, and b.) the potential consequences of a fire.

HAMISH ROBIN DENIZE

21 July 2025

ATTACHMENT 1

Emails with FENZ following 10 July 2025 meeting (separate attachment)

From: Lamont, Bobby <Bobby.Lamont@fireandemergency.nz>
Sent: Monday, 21 July 2025 8:34 am
To: Knapp, James; sbrooks
Cc: Paul Horne; Hamish Denize; Kevin Weller
Subject: RE: Maniatoto Plain Solar Farm- Post Meeting Follow Up

Hi Sarah

Your proposed wording looks acceptable to me also.

I will be meeting with the Naseby and Ranfurly brigades this Wednesday night to seek feedback on your proposed fire management plans and can relay these back to you once collated.

Kia ora rawa atu | Many Thanks

Bobby Lamont
Group Manager

Otago District – Central Otago
Te Kei Region
Five Mile, Building 1, Suite 1, Level 1,
34 Grant Road Frankton Queenstown 9300
PO Box 2360 Wakatipu, Queenstown 9349

Mobile: 027 601 1703



Our Values - NGĀ UARA | WE DO THE RIGHT THING – KIA TIKA | WE SERVE AND SUPPORT - MANAAKITANGA | WE ARE BETTER TOGETHER - WHANAUNGATANGA | WE STRIVE TO IMPROVE – AUAHATANGA

From: Knapp, James <James.Knapp@fireandemergency.nz>
Sent: Thursday, 17 July 2025 4:03 pm
To: Sarah Brooks <sbrooks@heliosenergy.co.nz>; Lamont, Bobby <Bobby.Lamont@fireandemergency.nz>
Cc: Paul Horne <Paul.Horne@beca.com>; Hamish Denize <hamish.denize@beca.com>; Kevin Weller <Kevin.Weller@beca.com>
Subject: RE: Maniatoto Plain Solar Farm- Post Meeting Follow Up

Kia ora Sarah,
Your proposed wording looks acceptable to me, thank you.

Glad to hear the plant list was useful – agreed Broadleaf would struggle in the wind and frost and would not be a goer for re-planting but does grow in the mountains nearby, so it would probably work at Naseby once you have established shelter / canopy.

Ngā mihi

James Knapp ([he/him](#))

Kaiwhakahaere Mōrea Hapori | Kaitirotiro
Community Risk Manager | Inspector
Otago District

M: 027 236 6092

james.knapp@fireandemergency.nz



www.fireandemergency.nz

85 Castle Street, PO Box 341, Dunedin 9054

My normal hours of work are 9am to 5pm Monday to Friday, but with reasonable flexibility.

There is no expectation that you will reply or take action outside *your* normal hours of work.

From: Sarah Brooks <sbrooks@heliosenergy.co.nz>

Sent: Thursday, 17 July 2025 3:36 pm

To: Lamont, Bobby <Bobby.Lamont@fireandemergency.nz>; Knapp, James <James.Knapp@fireandemergency.nz>

Cc: Paul Horne <Paul.Horne@beca.com>; Hamish Denize <hamish.denize@beca.com>; Kevin Weller

<Kevin.Weller@beca.com>

Subject: Re: Maniatoto Plain Solar Farm- Post Meeting Follow Up

Hi Bobby and James,

Bobby thanks for your time on the call just now. As discussed, we need to finalise our evidence by tomorrow which will include proposed wording around the certification of the fire management plans ahead of construction.

The intent of the proposed condition wording to capture this commitment is provided below (copied from previous email). **Could you please review and confirm back to me in writing this process appropriately captures our discussion (ideally before COP Friday 18 July)?**

"A minimum of [eight (8) weeks] before the activity commences (excluding any enabling works such as geotechnical investigations, piling tests and site surveys or testing), the consent holder must submit to the Planning Manager, Central Otago District Council, for their certification, the following plans ("Fire Risk Plans"):

- *construction fire risk;*
- *operational risk; and*
- *emergency response.*

The Fire Risk Plans shall be sent to FENZ for review and comment, and any comment(s) received shall be addressed prior to submitting to the Central Otago District Council for certification."

Look forward to also discussing further the general solar farm development post your meeting with the brigade next Wednesday.

James, after our call I went back and double checked how the proposed plant mix you recommended was carried across by the landscape architects in the final plan. Can confirm this was a baseline document used to prepare the planting plan, and after a review with local nurseries on what stock would be available at the scale required, all but three species were incorporated (attached is a screenshot from the Mt Iron planting plan you sent me, with the plants to be used in the proposed solar farm highlighted)

Cheers
Sarah

On Fri, Jul 11, 2025 at 2:17 PM Sarah Brooks <sbrooks@heliosenergy.co.nz> wrote:

Good Afternoon Bobby and James,

Thank you again for your time yesterday and appreciate the thoughtful questions in regards to the Solar Project. It was good to confirm alignment on the general approach.

I have re-attached for you the proposed site layout discussed which includes:

1) Access Tracks

- The perimeter access track labelled on the attached plan as ' Proposed Fire Road - 4m Wide + 2m Buffer on either side'. This has been added to the layout specifically to provide appropriate access for fire fighting purposes
- In addition the 'main site access track' shown throughout the site is 4m in width - there will be grass on either side of this track before the location of the closest infrastructure which reflects what Beca mentioned about vehicles being able to pass if they pulled partially off the track onto the grass (if required).
- All access tracks highlighted above will be of a hardstand material and has been designed to allow for maneuverability - the tracks will also have turning circles suitable for fire engines

2) Water Tanks

- The attached plan shows the water tanks in a central location. As discussed it may be beneficial to shift these to a north/ south of site configuration or position water tanks at the main site access points.
- Conceptually any of these options can be accommodated by Helios in the solar farm layout at detailed design stage. It is suggested the final location for water tanks can be picked up in future discussion to inform the detailed site design and accompanying management plans (discussed further below).

As discussed the Battery Energy Storage System (BESS) has been removed from the resource consent application. If this was to be revisited in the future, the BESS would be located adjacent to

the substation (on the area marked as 'utility area'). It would be subject to a new resource consent application and would need to provide a specific detailed fire risk mitigation plan including an assessment of any additional fire fighting requirements such as supplementary water tanks.

Timing for provision of Fire Risk Management Plans

As discussed on our call, the final selection of specific component types (make/ model/ inbuilt fire suppression measures) and the detailed construction methodology will be developed through detailed design stage, once a lead delivery contractor is appointed to the project (and input can also be sought from their O&M team).

We discussed that, practically, this level of detail is only available post consent once the project near constructions and lead contractors have been engaged.

Helios is happy to commit to working with FENZ at this later stage to provide the detailed fire risk mitigation plans (covering construction fire risk mitigation, operational risk mitigation and emergency response) for feedback, with the final agreed plans to be provided to Council for certification demonstrating FENZ input into, and review of, the final plans.

The intent of the proposed condition wording to capture this commitment is provided below. **Could you please review and confirm back to me this process appropriately captures our discussion?**

"A minimum of [eight (8) weeks] before the activity commences (excluding any enabling works such as geotechnical investigations, piling tests and site surveys or testing), the consent holder must submit to the Planning Manager, Central Otago District Council, for their certification, the following plans ("Fire Risk Plans"):

- *construction fire risk;*
- *operational risk; and*
- *emergency response.*

The Fire Risk Plans shall be sent to FENZ for review and comment, and any comment(s) received shall be addressed prior to submitting to the Central Otago District Council for certification."

Please do reach out at any time, happy to provide further information or discuss Project details further.

Kind Regards

Sarah

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www.heliosenergy.co.nz



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