Chapter 2 – Site Selection and Design Iterations

Dupplin Solar EIA Report

TRIO Dupplin Solar LLP

Prepared by:

SLR Consulting Limited

The Tun, 4 Jackson's Entry, Edinburgh, EH8 8PJ

SLR Project No.: 405.065787.00001

13 November 2025

Revision: 02

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	16 September 2025	EQ	GS	GS
02	13 November 2025	EQ	GS	GS

Table of Contents

Supporting Figures (EIA Report Volume 3a)

Acronyms and Abbreviations

EIA	Environmental Impact Assessment
GWDTE	Ground Water Dependent Terrestrial Ecosystems
NGR	National Grid Reference
PKC	Perth and Kinross Council
PV	Photovoltaic
SSEN	Scottish and Southern Energy Networks
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System

2. Site Selection and Design Iteration

2.1 Introduction

2.1.1 This Chapter outlines the process undertaken in selecting the Site as a suitable location for a solar farm; provides a description of the Site and surrounding area; and discusses the comprehensive design evolution process.

2.1.2 The principles of the EIA process, including that site selection and project design should be an iterative constraint-led process, have been followed. This has ensured that potential adverse impacts on the environment, as a result of the Proposed Development, have been avoided or minimised as far as reasonably possible through the design process.

2.1.3 This Chapter draws on issues considered in more detail in the relevant technical chapters (**Chapter 5: Landscape and Visual**; **Chapter 6: Ecology and Ornithology; Chapter 7: Cultural Heritage and Archaeology; and Chapter 8: Hydrology, Geology and Hydrogeology**), and in the supporting technical assessments (provided as appendices to this EIA Report). This Chapter does not pre-empt the conclusions of the technical assessments, but explains how potential environmental effects have informed the design of the Proposed Development.

2.1.4 The design of the Proposed Development is described in **Chapter 3: Proposed Development** and is shown on **Figure 2.3.**

2.2 The Site and Surrounds

2.2.1 The Site, centred on National Grid Reference (NGR) NO 04810 21645, is located north of the A9 at Dupplin Estate, Tibbermore - approximately 2.7 km west of Perth, within the Perth and Kinross Council (PKC) administrative area. The Site comprises 13 distinct agricultural fields enveloped by mature woodland to the west and east. The total area of the Site is 175 ha, of which approximately 126 ha will comprise solar arrays (refer to **Figure 2.3**).

2.2.2 The existing land use is predominantly arable farmland and distinct field margins (hedge, dykes) managed by the estate. There is one overhead electrical line running north west to south east through the eastern extent of the Site. Scottish Water maintain and operate a water tank immediately south of the Site on the Roman Road at NO 04480 20973.

2.2.3 There are no residential properties on the Site. The closest residences are within the working estate on the south eastern boundary of the Site (Windyedge Cottage), and on the eastern boundary near Tibbermore Road. A small cluster of dwellings, also associated with the estate, is located approximately 200 m north of the Site along Old Gallows Road. The small village of Tibbermore is located approximately 1.4 km north east of the Site.

2.2.4 The Site does not overlap with any statutory nature conservation designations. The woodland to the west (Cultmalundie) and east (West Lamberkine) are both

listed on the Ancient Woodland Inventory (AWI, of plantation origin). The closest statutory sites are Dupplin Lakes Site of Special Scientific Interest (SSSI) approximately 10 m south west of the Site, and South Tayside Goose Roosts Special Protection Area (SPA) approximately 800 m south west of the Site, which overlaps an extent of Dupplin Lakes. Methven Moss Special Area of Conservation (SAC) is approximately 2.6 km north west.

2.2.5 The Site and surrounding area contain several prehistoric assets. One designated heritage asset is located within the Site boundary – Battle of Tippermuir (BTL39, Inventory of Historic Battlefields). However, it has been confirmed by relevant consultees[1] that the designated battle boundary does not reflect the precise geographical location of the battle itself. Old Gallows Road (MPK18634) runs east to west c.300 m north of the Site and is considered relevant to the battlefield.

2.2.6 Ten non-designated heritage assets are located within the Site boundary as recorded in the Historic Environment Record maintained by Perth and Kinross Heritage Trust (PKHT). These generally represent two periods – Roman and post-medieval – and are listed and described in **Chapter 7: Cultural Heritage and Archaeology**.

2.3 Site Selection and Consideration of Alternatives

2.3.1 Schedule 4, paragraph 2 of the EIA Regulations requires that an EIA Report should include: *"a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."*

2.3.2 The Site was identified as an area which would be appropriate for solar development through initial site selection and consideration of environmental and planning constraints in the PKC area. High-level mapping of constraints demonstrated feasible developable land within Dupplin Estate[2], specifically the expanse immediately north of the A9 near Tibbermore. The Site was identified as one of the few sizeable extents of land within 7 km of the required Grid Connection Point at Burghmuir substation, Perth – available land which is generally unconstrained in environmental and planning terms, and therefore suitable for renewable energy infrastructure (refer to **Appendix A**).

2.3.3 The following key issues have been considered as part of this process:

[1] Discussions with the First Marquis of Montrose Society as part of detailed pre-application consultation has confirmed the battle was not located at the Site, and was much closer to Perth.

[2] TRIO Dupplin Solar LLP undertook a feasibility and constraints mapping exercise for land within the Perth and Kinross Council area. This exercise underpinned the production of a public tool which was available / viewed for the 2nd public exhibition. This comprised a large A3 hard backed-book containing acetate overlays of 'buildable' constraints within 7 k of the proposed grid connection point. This helped illustrate the constraints and feasibility process to the public, and clearly presented the Site as a viable option for solar. The plans were produced by BLC Energy on behalf of TRIO Dupplin Solar LLP and a proof is contained within **Appendix A.**

- cumulative developments (i.e. the proximity of the Site to other solar farm developments and the potential for significant cumulative effects arising between them);
- grid connection (i.e. within 7 km of a substation with sufficient capacity to export the power generated);
- environmental designations (i.e. international and national designations for ecology, landscape, cultural heritage and SEPA flood risk mapping); and
- yield (i.e. sufficient irradiation).

2.3.4 This process determined that the Site would be appropriate for a solar development, with no perceived inter-visibility with planned or consented solar developments within 2 km of the Proposed Development; sufficient and viable grid availability in the area; proximity to a grid connection point; and with no environmental or heritage designations within the Site boundary that would significantly constrain development.

2.3.5 Having determined that the Site would be appropriate for a solar farm development based on the above factors, initial baseline studies and survey works were undertaken, which included:

- Consideration of topography (i.e. the availability of flat and south facing fields which offer a higher level of energy production, lower levels of overshading meaning that panels can be placed in closer proximity).
- Consideration of land use – online data[3] suggests the Site is Class 3.1, the lowest grade of prime agricultural land and Class 3.2 land. A Land Capability for Agriculture (LCA) survey has been undertaken across the Site which confirmed that the majority of the soil is Class 3.1 with isolated pockets of non-prime, Class 3.2 land - limited by soil depth in the west half of the Site. There is an abundance of prime agricultural land nearby (particularly south of the River Earn, and to the west). Refer the LCA assessment report - **Volume 4 Technical Appendix: Land Capability for Agriculture Assessment**.
- Identification of visual impact receptors – the closest receptors are residences located to the north, and commuters utilising the A9 northbound carriageway to the south. Potential impacts on visual amenity for residential receptors and drivers was investigated through an initial viewshed analysis.
- Determining an indicative layout that could be supported by the Site – informed by comprehensive utilities data (including mapped assets provided by Scottish Water, Scottish and Southern Energy Networks (SSEN) etc).
- Planning a robust programme of pre-application discussions to involve PKC, NatureScot, other statutory and relevant consultees, and undertaking a high-level assessment of other recent planning applications relevant to the Site.

2.3.6 These steps identified the Site as one with good potential for solar development and with minimal environmental constraints. Refer to **Appendix A** for constraints mapping of developable land undertaken by TRIO Dupplin Solar LLP.

[3] Scotland's Soils: https://soils.environment.gov.scot/maps/capability-maps/national-scale-land-capability-for-agriculture/

2.4 Design Principles

2.4.1 In an EIA, the identification of constraints should continue throughout the design process as more detailed surveys are completed. In this way, the findings of the technical and environmental studies can be used to inform the design of a development and hence achieve a 'best fit' within the Site.

2.4.2 The Applicant adopted the following principles during the design iteration process to ensure the final design of the Proposed Development was the most suitable for the Site:

- avoid designated and protected sites;
- sensitively design the solar arrays to avoid or minimise direct or setting effects on heritage assets;
- avoid or minimise impacts on any sensitive ecological habitats and species;
- minimise impacts in respect of noise and the visual amenity of residential properties;
- minimise traffic and transport impacts;
- consider topography in terms of suitability for siting panels;
- avoid areas of high-risk flooding; and
- maximise the potential renewable electricity generation.

2.5 Iterative Scheme Design

2.5.1 The initial Proposed Development layout was designed to maximise renewable energy yield and focus on south facing and flat land. It also included a buffer from the residential dwellings to the north, east and south east of the Site boundary.

2.5.2 Layout changes were subsequently made following the completion of a rigorous programme of baseline studies, surveys and consultations. The aim was to continue maximising renewable energy yield while avoiding environmental and technical constraints, ensuring no significant adverse environmental effects as well as taking into consideration feedback from local residents. Care was also taken to maintain existing field boundaries, allowing breaks in panel rows for maintenance.

2.5.3 Early design iterations excluded areas of the Site (refer to **Figure 2.1, Layout 1: Concept Layout**):

- rectangular area along the south of the Site adjacent to the A9 northbound carriageway excluded from the Proposed Development in order to provide a visual stand-off buffer from solar arrays;
- rectangular area along the north of the Site excluded due to proximity of residential properties at Old Gallows Road;
- development buffers (i.e. no-build zones) were applied to woodland stands and neighbouring ornithological designations in order to minimise potential disturbance to potential roosting bats, roosting/foraging birds and other

habitats of ecological value such as Ancient Woodland at Cultmalundie (refer to **Chapter 6 – Ecology and Ornithology**);

- development buffers around properties within the Dupplin Estate to ensure appropriate stand-off distance from any proposed electrical infrastructure i.e. substation compound, particularly with regard to construction noise and visual amenity;
- a 15 m development buffer from individual trees – additional to a 30 m woodland standoff - and 15 m buffers to pylons in the east of the Site, to prevent overshading of panels;
- a 30 m development free corridor encompassing the entirety of the Site perimeter to maintain ecological connectivity between woodland stands to the west (Cultmalundie) and the east (West Lamberkine Woods) - essentially providing habitat connectivity and a commuting corridor for bats and birds.

2.5.4 These design iterations have been made in line with the design principles set out in **Section 2.4.2**.

2.5.5 There have been three principal iterations in the design of the Proposed Development. These iterations, referred to as Layouts 1 to 3, are summarised below.

Layout 1: Concept Layout

The Concept Layout (refer to **Figure 2.1**) was informed by preliminary desktop environmental surveys, and was the layout presented at initial community consultation events in August 2025. This layout represented maximum coverage of the Site with solar panels based on maximising generating capacity whilst taking consideration of known Site constraints. This initial layout also included for a 15 MW Battery Energy Storage System (BESS) and substation compound to the north east of the Site.

Layout 2: Preliminary Layout

2.5.6 In September 2025, the Preliminary Layout (refer to **Figure 2.2**) was informed by additional survey work (including hydrology), pre-application consultation with PKC and local community councils[4], and feedback from community engagement, including the public exhibition in August 2025. One of the key concerns raised by Methven District Community Council was about the potential for adverse impacts to visual amenity from Tibbermore, Gloagburn and Methven.

2.5.7 Layout 2 reflected changes to the location of the supporting electrical infrastructure – namely the substation, impermeable compound hardstanding and associated drainage (including swale and an outfall pipe originally routed to the field drain in the north east of the Site).

[4] Methven District Community Council – concern was raised about impacts to visual amenity from Tibbermore, Gloagburn and Methven. Concerns were addressed directly by BLC Energy on behalf of TRIO Dupplin Solar LLP, and viewpoints subsequently incorporated into the LVIA.

2.5.8 Given the increasing elevations across the north of the Site, the initial proposed location of the substation to the north east was exposed and would have been very visible to residential receptors north of the Site (including at Tibbermore, Gloagburn Farmshop and potentially parts of Methven). The revised substation location to the south west of the Site near the access at C411 Roman Road was considered more suitable as it would be screened by an intervening woodland stand to the immediate east.

2.5.9 The BESS was removed following feedback from the local community at the August 2025 exhibition event, with concerns on noise and fire risk being acknowledged by the Applicant. In addition, solar arrays to the far south east of the Site were removed from land along a field drain which is frequently subject to surface water pooling.

Layout 3 (Final Layout)

2.5.10 The final layout (refer to **Figure 2.3** is the layout which is now subject to the application for Section 36 consent. Layout 3 was initially refined based on constraints identified from further Site surveys and baseline assessments including:

- Preliminary Ecological Appraisal (i.e. with a focus on bat, badger and other protected species including Great Crested Newt);
- flood risk extents (i.e. mapped worst-case flood risk extents);
- archaeological protection buffers (for undesignated assets);
- potentially buried (unknown) pre-historic assets;
- Site access requirements (i.e. utilities crossings, proximity to any core paths, visibility splay extents, avoiding well-utilised local routes);
- viewshed of Zone of Theoretical Visibility; and
- proposed planting and vegetative screening – specifically along the boundary adjacent to the A9 carriageway, along the Tibbermore Road boundary, and along the north near Old Gallows Road).

2.5.11 This final layout was subject to a number of iterations preceding a design freeze workshop, including further detailed assessment on Private Water Supplies (PWS), alternative drainage options, surface water flood risk, ‘designing-out’ of undesignated heritage assets within the Site through the placement of no-construction zones on the footprints of the assets, and spacing of array clusters to accommodate the undesignated heritage footprints.

2.5.12 Panels were removed from the entirety of the north west field due to the presence of a PWS borehole. This action was taken to avoid potential construction impacts in line with SEPA best practice guidance[5]. No intrusive geotechnical pit surveys

[5] SEPA PWS guidance - guidance-on-assessing-the-impacts-of-developments-on-groundwater-abstractions.docx

(c.1.2 m depth) or piled footings (1.5 m -3.5 m depth) are permitted within 250 m of this borehole in order to protect the PWS, in line with the SEPA best practice guidance on groundwater abstractions

2.5.13 The initial site access (east of the Scottish Water tank) was relocated due to the presence of a Scottish Water pipe transecting the south field near Roman Road. Following liaison with technical teams and review of project timelines, the decision was made to relocate the access further west to ensure the access point would traverse at a trenched/protected extent of the pipe (where it runs under C411 Roman Road).

2.5.14 As part of the design evolution process, it was proposed that the large eastern field along Tibbermore Road would be retained purely for biodiversity enhancement. No solar panels or infrastructure have been included in this land parcel. Native hedgerow, trees and wildflower meadow mix in addition to ecological features of biodiversity value will contribute towards naturalising habitat and will enhance views from the eastern boundary of the Site.

References

Scottish Government (2017) The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Available at: https://www.legislation.gov.uk/ssi/2017/102/contents/made .