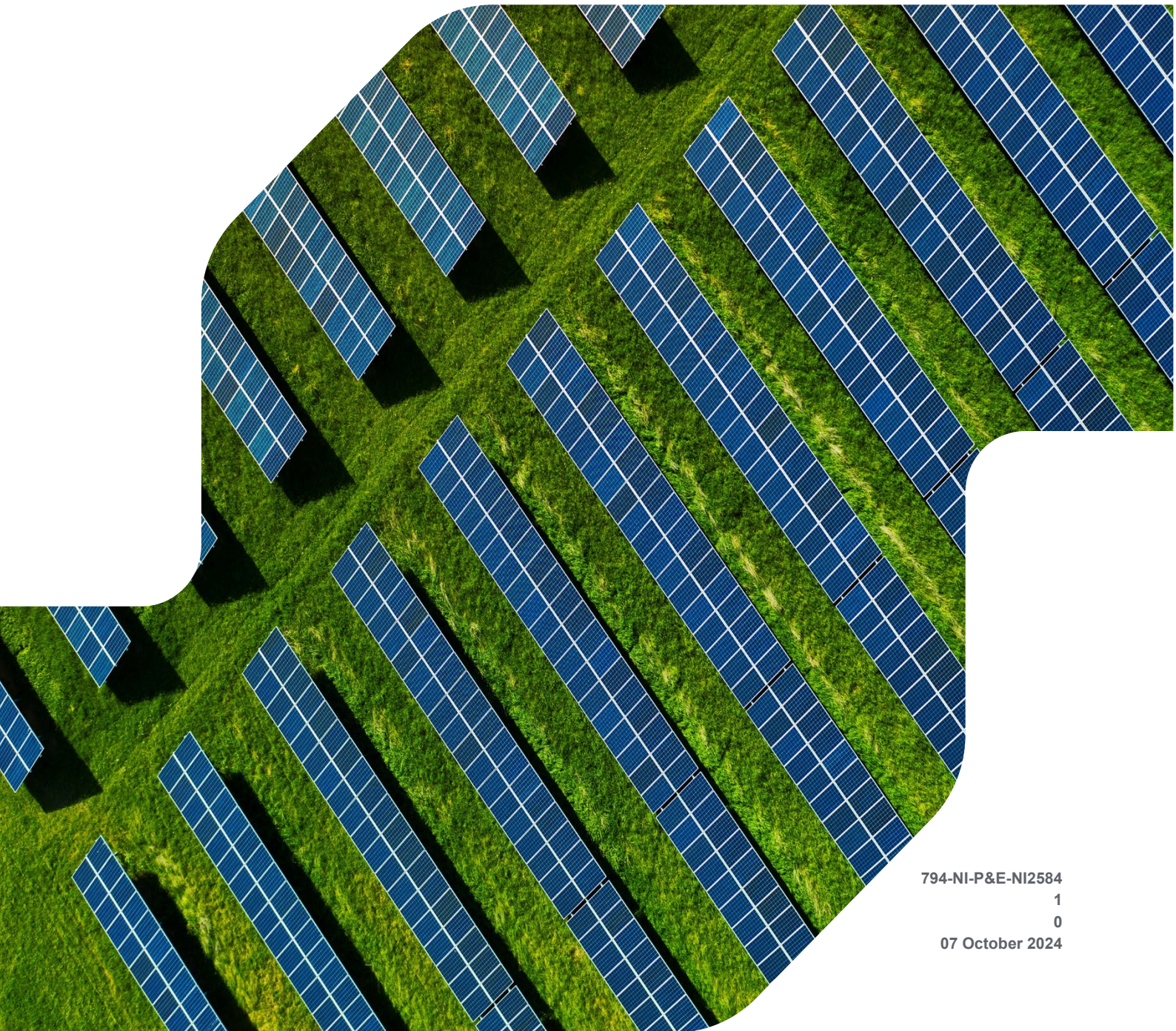


PETERHEAD SOLAR PHOTOVOLTAIC (PV) AND ENERGY STORAGE FACILITY

Land Capability for Agriculture (LCA) Assessment



794-NI-P&E-NI2584

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07 October 2024

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Drawing 1 LCA Partial Mapping

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Figure 1-1 Proposed Site Location

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- Photovoltaic (PV) Solar Panels erected on steel frames in south-facing arrays;
- Inverter Substation Containers;
- Battery Energy Storage System (BESS) Facility;
- Primary Substation Compound;
- CCTV Cameras;
- Perimeter post and wire “deer” fencing; and

- Associated internal service tracks. See Figure 1-2 below for the concept layout plan.

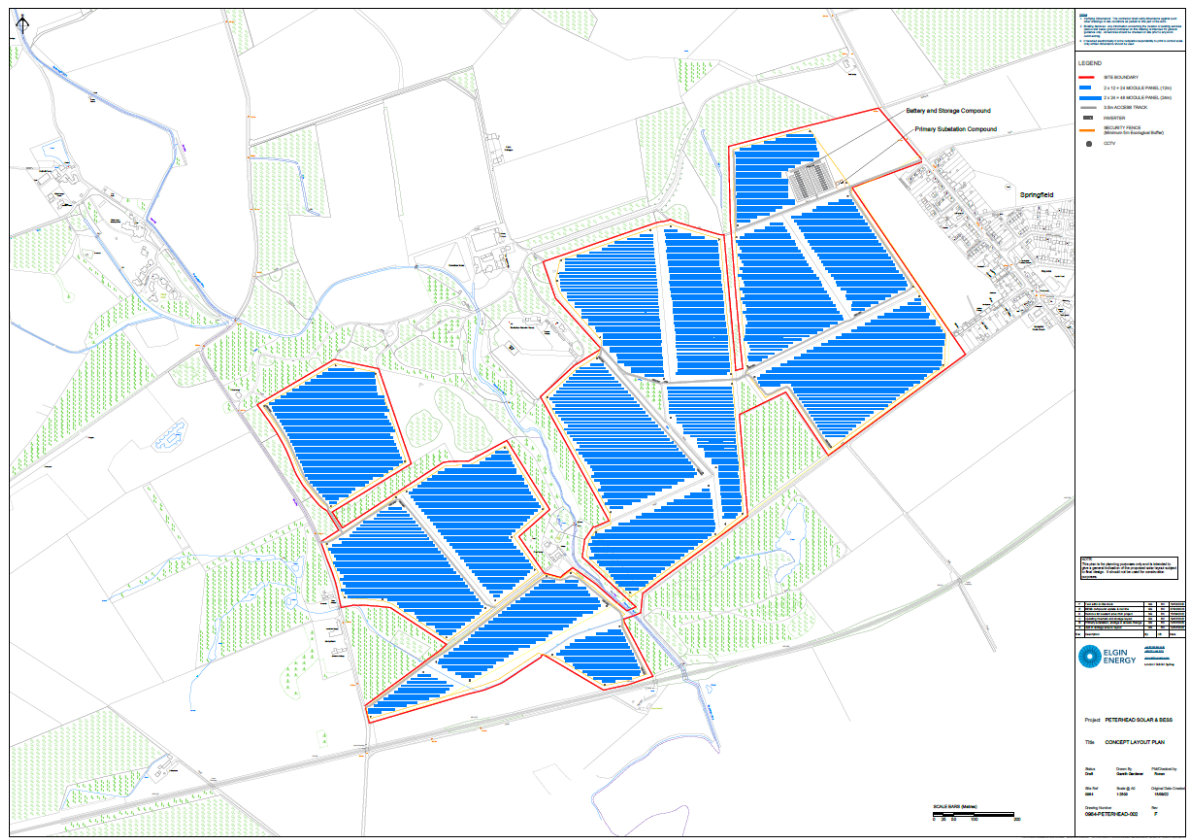


Figure 1-2 Concept Layout Plan

- 1.4 Section 2 of the report considers the National and Local Planning Policy context relevant to consideration of the potential effects of the proposed development on agricultural land quality.
- 1.5 The methodology for data collection is presented in Section 3 of the report. Section 4 describes the location, land use and topography of the Site and the published geological and soils characteristics relevant to the land capability of the Site are provided in Section 5. The LCA of the Site is presented in Section 6 and the nature of the farm holding affected is described in Section 7. An analysis of the findings from the assessment is provided in Section 8.

2 POLICY BACKGROUND

Planning Policy Context

National Planning Framework for Scotland 4 (NPF4), 2023

- 2.1 Policy 5b provides policy in relation to the protection of agricultural land and states:
- “Development proposals on prime agricultural land, or land of lesser quality that is culturally or locally important for primary use, as identified by the LDP, will only be supported where it is for:
- i. Essential infrastructure and there is a specific locational need and no other suitable site;
 - ii. Small-scale development directly linked to a rural business, farm or croft or for essential workers for the rural business to be able to live onsite;
 - iii. The development of production and processing facilities associated with the land produce where no other local site is suitable;
 - iv. The generation of energy from renewable sources or the extraction of minerals and there is secure provision for restoration; and
- In all of the above exceptions, the layout and design of the proposal minimises the amount of protected land that is required”.
- 2.2 Prime land is defined as Classes 1, 2 and 3.1 of the LCA system.

Fife Council Local Development Plan (2017)

- 2.3 Policy 7 (Development in the Countryside) states in relation to prime agricultural land:
- ‘Development on prime agricultural land will not be supported except where it is essential:
- 1. as a component of the settlement strategy or necessary to meet an established need, for example for essential infrastructure, where no other suitable site is available;
 - 2. for small-scale development directly linked to a rural business; or
 - 3. for the generation of energy from a renewable source or the extraction of minerals where this accords with other policy objectives and there is a commitment to restore the land to its former status within an acceptable timescale’

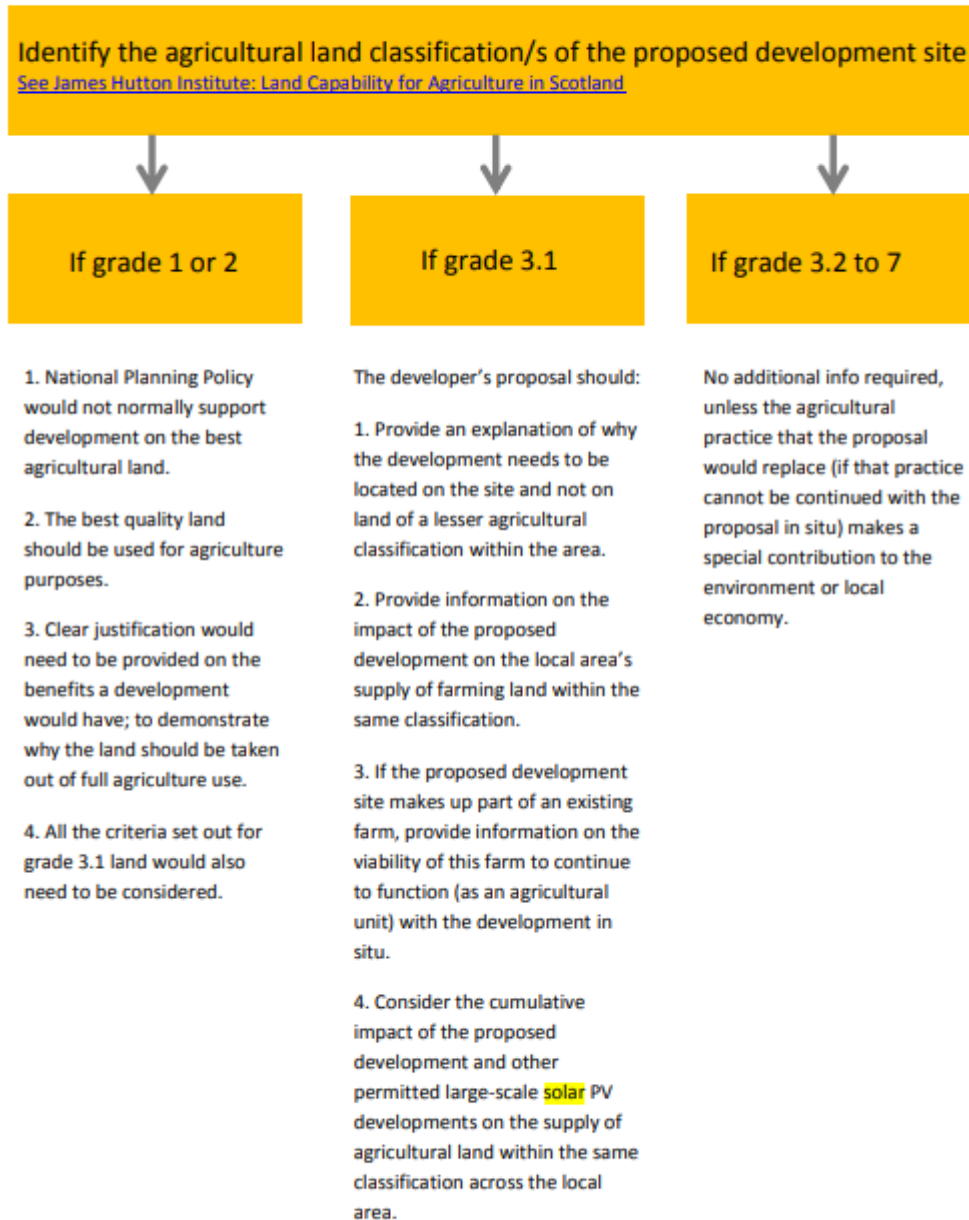
Fife Council Low Carbon Supplementary Guidance (2019)

- 2.4 Section 2.2.2c sets out the requirements to assess the cumulative impact of solar farms on agricultural land as follows:

c. Assessing the cumulative impact of solar farms

Cumulative impact on prime agricultural land

The following steps for developers on agricultural land classification are based on the assessment process set out in the [BRE Planning guidance for the development of large scale ground mounted solar PV systems](#) document.



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3 METHODOLOGY

- 3.1 The methods used to collect data for the appraisal of soils and LCA on the Site are described below.

Land Capability for Agricultural Classification

- 3.2 The assessment of the effects on agricultural land quality and soil resources is based on a desk top assessment of relevant published information:

- Geological Information from British Geological Survey Internet Portal at: www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html.
- Soil map available online at http://map.environment.gov.scot/Soil_maps/?layer=5# (consulted April 2024).
- The James Hutton Institution - Soil Survey of Scotland 1:63:360 scanned maps (1950s-80s) available online at: <https://www.hutton.ac.uk/learning/natural-resource-datasets/soilshutton/soils-maps-scotland> (Consulted April 2024).
- LCA partial cover mapping available at: http://map.environment.gov.scot/Soil_maps/?layer=5.
- Bibby J S et al, 1991. Land Capability Classification for Agriculture. The Macaulay Land Use Research Institute, Aberdeen.

Farm Holding

- 3.3 Data about the nature and operation of the farm holding of which the Site forms part of has been provided directly from the current farming family.

4 LOCATION, LAND USE AND TOPOGRAPHY

Location, Land Use and Topography

- 4.1 The Site is located within Rankeilour Estate to the west of the village of Springfield, Fife.
- 4.2 The land comprises mainly agricultural fields in arable cultivation. According to publicly available soils mapping, the Site generally gently slopes from north east to south west from an elevation of approximately 50m to approximately 35m. The gradients across the site do not limit the quality of the agricultural land according to the LCA system.

5 PUBLISHED GEOLOGICAL AND SOIL INFORMATION

Superficial Geology

- 5.1 The BGS Geology Viewer at <https://geologyviewer.bgs.ac.uk/> (see Figure 5-1 below) maps the eastern area to be underlain by Glacial Till (boulder clay) in green with Glaciofluvial Sheet Deposits (gravel, sand and silt) in pink underlying the western area. Alluvium (clay, silt, sand and gravel) is mapped along water courses.

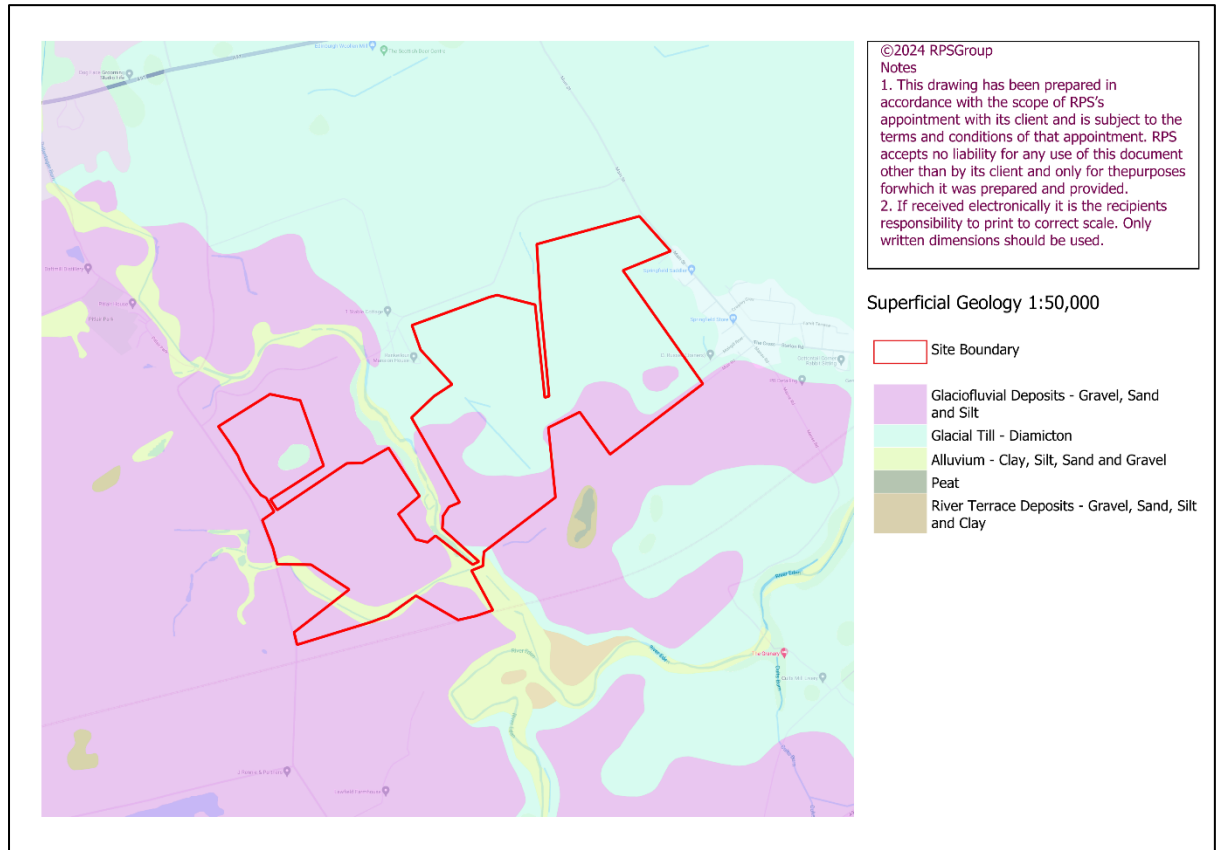


Figure 5-1 - BGS Site Superficial Geology

Soils

- 5.2 The soil map available online at http://map.environment.gov.scot/Soil_maps/?layer=5# (consulted April 2024) is shown in Figure 5-2 below:

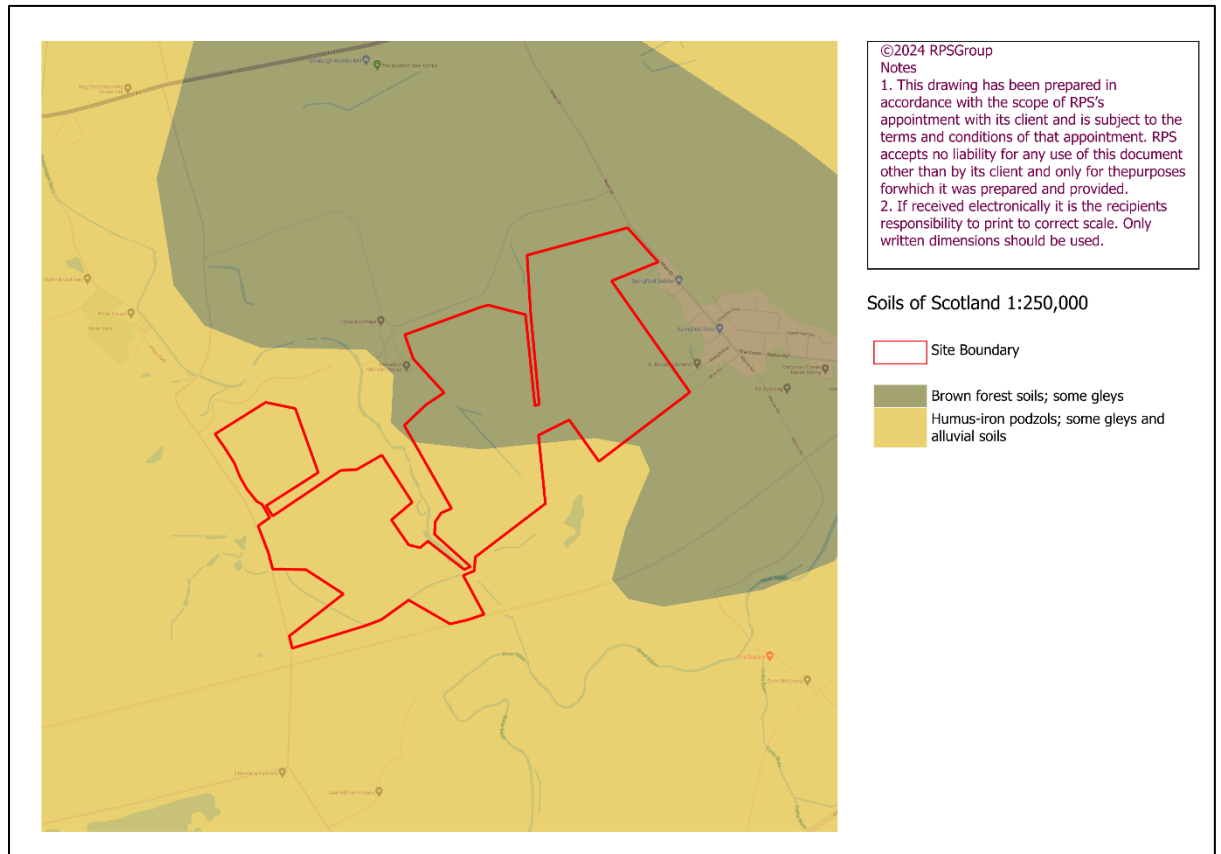


Figure 5.2 - Soil Types

5.3 Two soil types are present on the site, the Kippen series (dark brown tone) across the eastern area and the Eckford series (light brown tone) across the western area.

5.4 Generalised soil type details of the Kippen series are as follows:

Soil Association	Kippen
Soil Map Unit	Urquhart
Major Soil Group	Brown soils
Major Soil Subgroup	Brown earths
Soil Phase Description	
Soil Drainage	freely drained
Component soils (Soil complexes only)	
Land form (Soil complexes only)	
Parent Material	Residual weathered drifts derived from sandstones of Upper Old Red Sandstone age
Generalised Soil Type	Brown soils

5.5 Generalised soil type details of the Eckford series are as follows:

Soil Association	Eckford
Soil Map Unit	Giffordtown
Major Soil Group	Podzols
Major Soil Subgroup	Humus-iron podzols
Soil Phase Description	
Soil Drainage	freely drained
Component soils (Soil complexes only)	
Land form (Soil complexes only)	
Parent Material	Glacio-fluvial deposits of sands and gravels derived from sediments of Upper Old Red Sandstone age
Generalised Soil Type	Mineral podzols

- 5.6 As expected, given their location on Site relative to superficial geology mapping both soil types are linked to their parent materials in that the Kippen series are described as brown soils derived from residual weathered drifts and as such are freely drained. Whereas the Eckford series are described as mineral soils derived from the underlying glacio-fluvial sands and gravels and as such are freely drained.
- 5.7 The Fife and Kinross Soil Survey of Scotland 1:63:360 scanned map provides further detail with regards the above soil types with the Kippen series on site comprising mainly Butterwell, Urquhart and Fourmerk associations and the Eckford series on site comprising mainly Giffordtown and Hexpath associations.

6 LAND CAPABILITY FOR AGRICULTURE (LCA) CLASSIFICATION OF THE SITE

- 6.1 Maps of the Land Capability for Agriculture are based on interpretations of soil maps made by officers of the Soil Survey of Scotland. They were originally published as a series of 1:50,000 maps but the information is now also available online at: http://map.environment.gov.scot/Soil_maps/?layer=5#.
- 6.2 The relevant portion of the LCA map for the site is reproduced in Figure 6-1 below and also shown on Drawing 1, which is appended to this report.

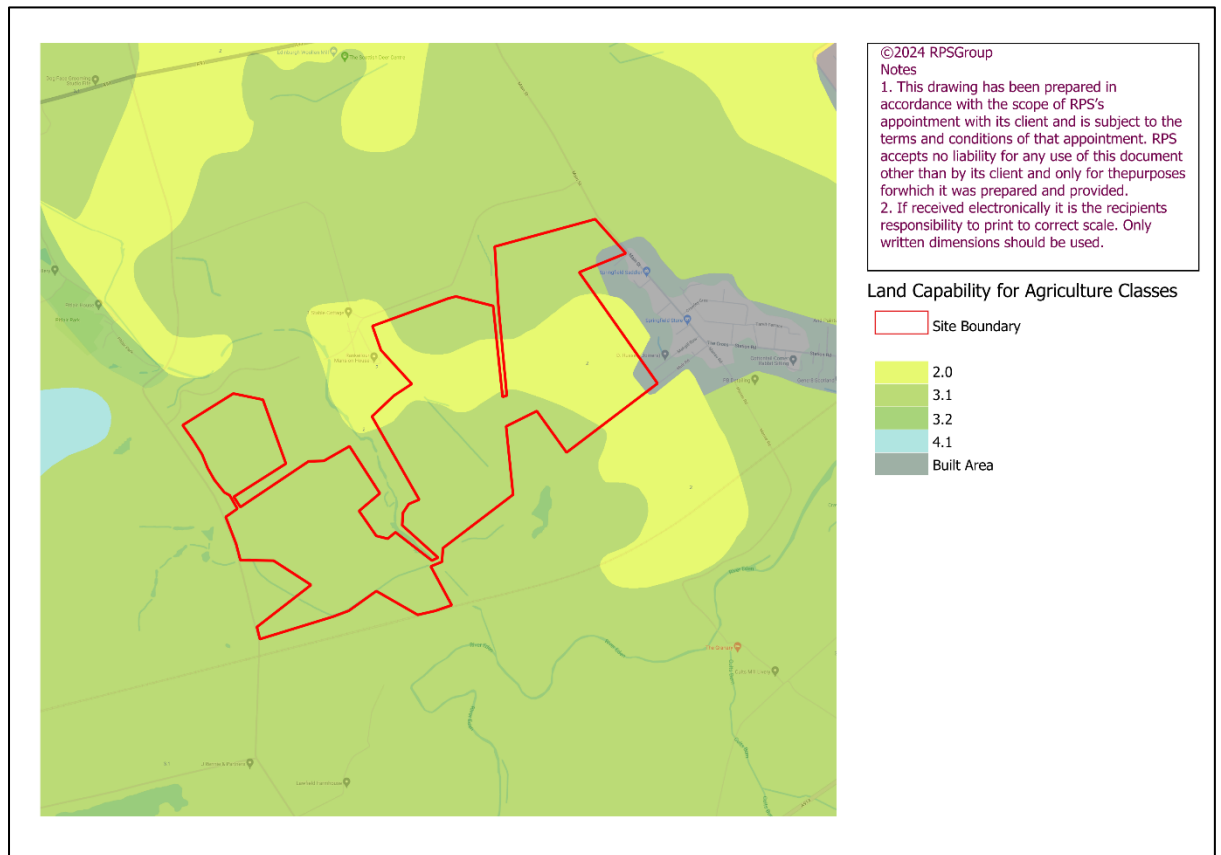


Figure 6-1 - LCA Classes On-site

- 6.3 Although the LCA mapping and the soils mapping don't fully correlate, in general the freely drained soils of the Kippen series in the east are considered to be Class 2 (yellow tone) with the Eckford series in the east considered to be Class 3.1 (pale green).
- 6.4 Short definitions of these classes are:
- 2 - Land capable of producing a wide range of crops.
 - 3.1 - Land capable of producing consistently high yields of a narrow range of crops and/ or moderate yields of a wider range. Short grass leys are common.
- 6.5 The areas and percentages of LCA classes across the Site is therefore as follows:

Table 1 - LCA Class Summary for the Site

LCA Class	Area (Ha)	%
2	25.18	24.5
3.1	76.56	74.5
Built-up area	1.02	1
Total	102.76	100

7 FARM HOLDING

- 7.1 The Site forms part of a larger based agricultural holding comprising a total of approximately 351 hectares, which comprises predominantly arable land with some grassland (including areas resown following sand extraction) and forestry/woodland, see details below.

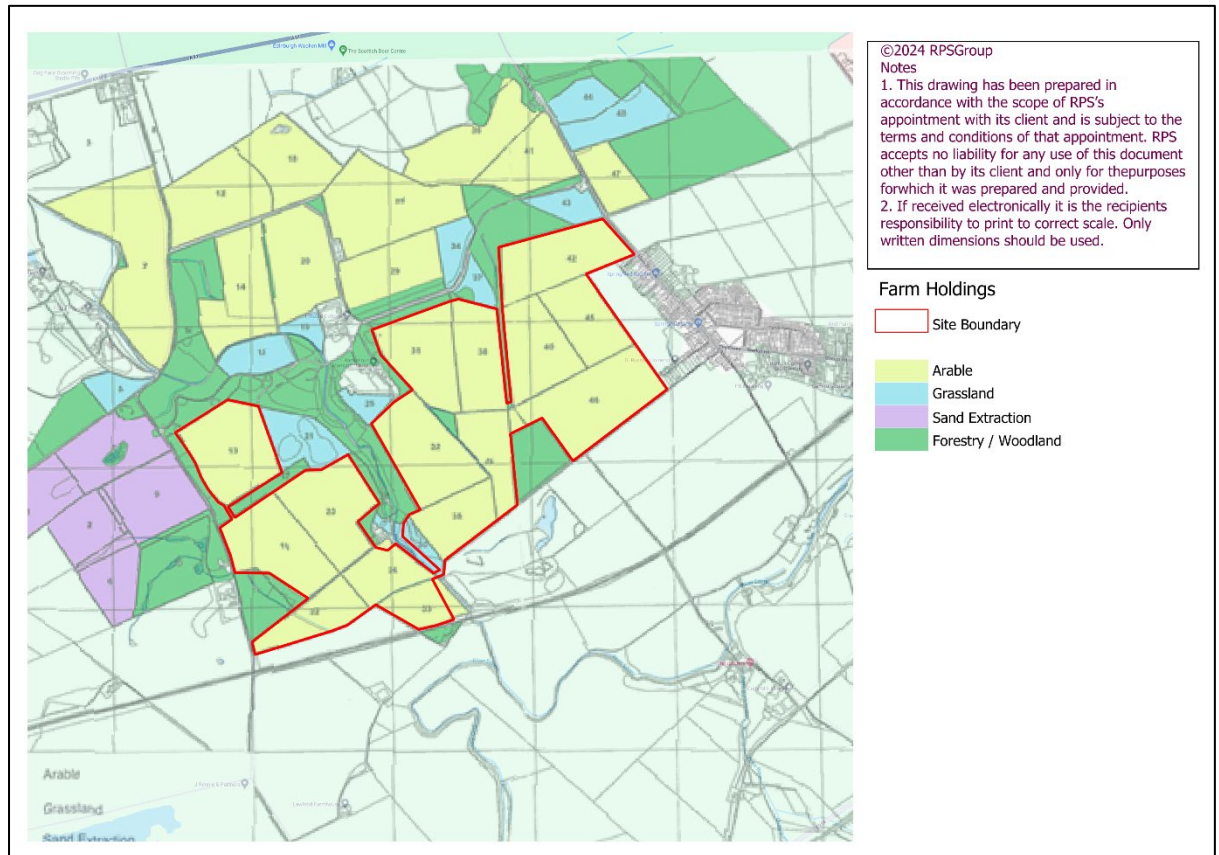


Figure 7-1 – Farm Holding Details

- 7.2 The use of the land for the proposed solar array covers approximately 103 hectares and would therefore affect approximately 29% of the total farm holding. This would not affect the continued operation of the holding, indeed, the diversification of the use of the land to incorporate the solar array across this part of the holding would help to secure the future operation of the remaining holding, with the additional revenue generated from the solar array being available for reinvestment into the farming business.
- 7.3 In addition, the provision of a grassland use within the operational site (excluding the BESS and substation area in northeast) would provide potential for sheep grazing to be carried out underneath the panels in accordance with the wider landscaping and biodiversity proposals for the site. Whilst the arable use of the land (approximately 95% of the 103 hectare Site, refer to Figure 7-1 above) would not continue during the operational period, there is potential for continued agricultural grassland use during this period as part of the wider farm holding.
- 7.4 The grassland use of the land during the operational period would also offer potential benefits to soil health through the increase in soil organic matter, improvement in soil structure and improvement in the biological function of the soil. These benefits would offer benefits to the potential productivity of the land following the decommissioning of the solar array.

-
- 7.5 Given the nature of the BESS and substation development and timelines until decommissioning, the agricultural soils within this footprint (approximately 1 hectare) would be permanently lost (although the stripped soils should be re-used elsewhere with the wider Site). It should also be noted the BESS and substation footprint has been located such that it avoids Grade 2 Prime land.
- 7.6 Therefore, the loss of the land from this holding would have a limited effect on the overall arable productivity from this large farm holding and would have limited effect on the employment generated from the enterprise or the continued viability of the holding.

8 ANALYSIS AND CONCLUSIONS

- 8.1 The desk top information shows the Site to comprise prime agricultural land, predominantly in the lowest class, 3.1, of the prime definition.
- 8.2 National policy recognises the need for renewable energy and the potential for this to be located on prime agricultural land where it states:
- ‘The generation of energy from renewable sources or the extraction of minerals and there is secure provision for restoration’ and ‘the layout and design of the proposal minimises the amount of protected land that is required’.*
- 8.3 Local Policy by way of the Fife Council Local Development Plan also alludes to a commitment to restore the land to its former status within an acceptable timescale whilst the Fife Council Low Carbon Supplementary Guidance (2019) sets out the following key items to be considered in relation to the use of prime (3.1) land for solar PV development:
1. Consideration of alternative sites with a lesser agricultural classification.
 2. The impact of the proposed development on the local area’s supply of farming land within the same classification.
 3. The viability of the wider farm to continue to function with the development in situ.
 4. The cumulative impact on the supply of agricultural land within the same classification across the local area.
- 8.4 For the Grade 2 prime land the local 2019 guidance also requires justification of the benefits the development would have to demonstrate why the land should be taken out of full agricultural use.
- 8.5 In relation to point 1, and in order for the development of the Site to remain economically viable, the Site needs to be located as close as possible to the operational Cupar substation (located off Westfield Road on the western outskirts of the town). The Cupar substation is located approximately 3km to the north east as the crow flies to avoid unnecessary cable runs, anything more than 5km is deemed to be economically unviable. As can be seen from the LCA mapping extract below there is very limited non-Prime land located within 5km to the west (to avoid cabling through the town) of the Cupar substation. On this basis, there would be very limited areas where commercially viable sites could be located.

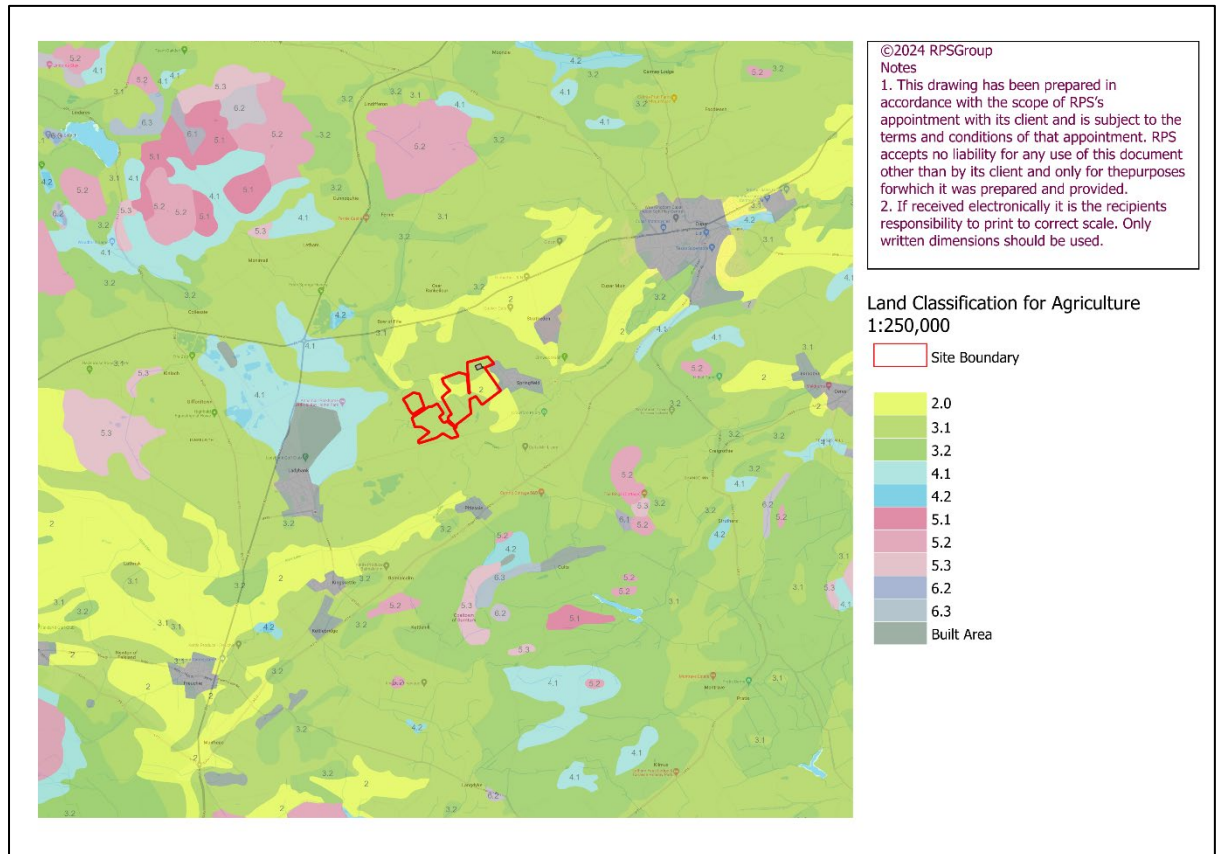


Figure 8-1 – LCA Mapping Extract

- 8.6 In relation to point 2 above and as noted from Figure 8-1 and Section 8.5, there is considered to be an abundance of Prime (Grades 2 and 3.1) agricultural land nearby.
- 8.7 In relation to point 3 above, Section 7 has concluded that the loss of the land from this holding would have a limited effect on the overall arable productivity from this large farm holding and would have limited effect on the employment generated from the enterprise or the continued viability of the holding.
- 8.8 In relation to point 4 above, a review has been undertaken using Fife Council's website, to identify if there are any solar or BESS planning permissions on, or in close proximity (within a 5km radius), to Cupar Substation, the findings are as follows:

Table 8.1: Surrounding Planning History – Solar

Reference	Address	Description	Status	Determination Date
23/00663/SCR	Uthrogle Mills Carslogie Cupar Fife KY15 4PD Easting – 334262 Northing - 713026 Approx. 2km from substation	EIA Screening for proposed solar farm	Decided – EIA not required	04/05/2023

Application link -

<https://planning.fife.gov.uk/online/applicationDetails.do?activeTab=summary&keyVal=RR17L6HF00100>

Table 8.2: Surrounding Planning History – Battery Storage

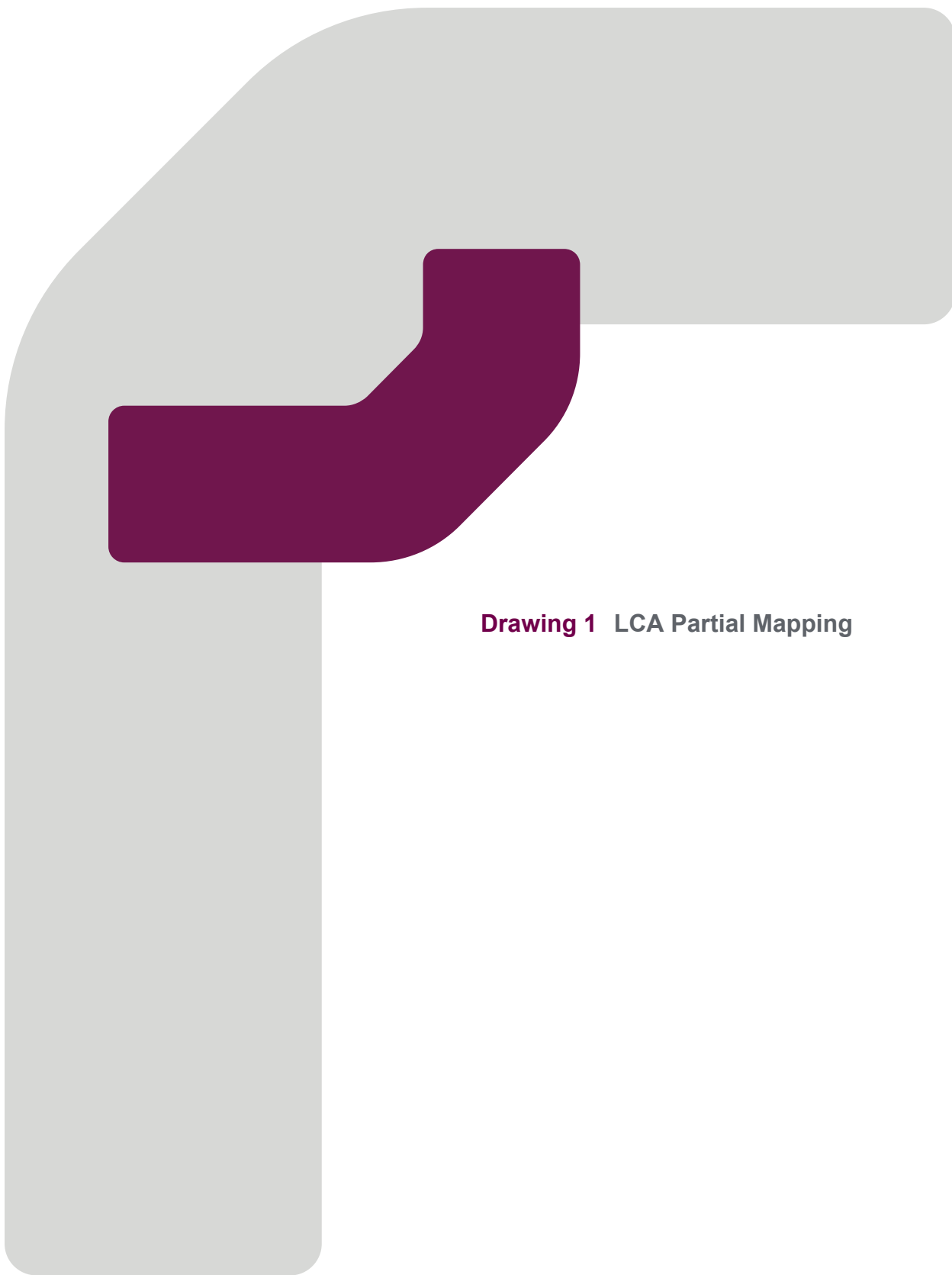
Reference	Address	Description	Status	Determination Date
1 18/02245/FULL	Land west of Ferrymuir, south of Westfield Road, Cupar Easting – 335492 Northing – 713513 Approx. 740m from substation	Erection of battery storage compound comprising of containerised battery storage units and installation of boundary fence and associated works	Approved with Conditions	15/03/2019
2 19/02750/FULL	Land west of Ferrymuir, south of Westfield Road, Cupar Easting – 335492 Northing – 713513 Approx. 740m from substation	Proposed erection of battery storage compound (49.9MW) comprising of containerised battery storage units and installation of boundary fence and associated works (increase in capacity from 19.99MW permitted under 18/02245/FULL)	Approved with Conditions	21/11/2019

Application Links:

- 1) <https://planning.fife.gov.uk/online/applicationDetails.do?activeTab=documents&keyVal=PD1TW4HFM3R00>
- 2) <https://planning.fife.gov.uk/online/applicationDetails.do?keyVal=PXXJHIHFN3L00&activeTab=summary>

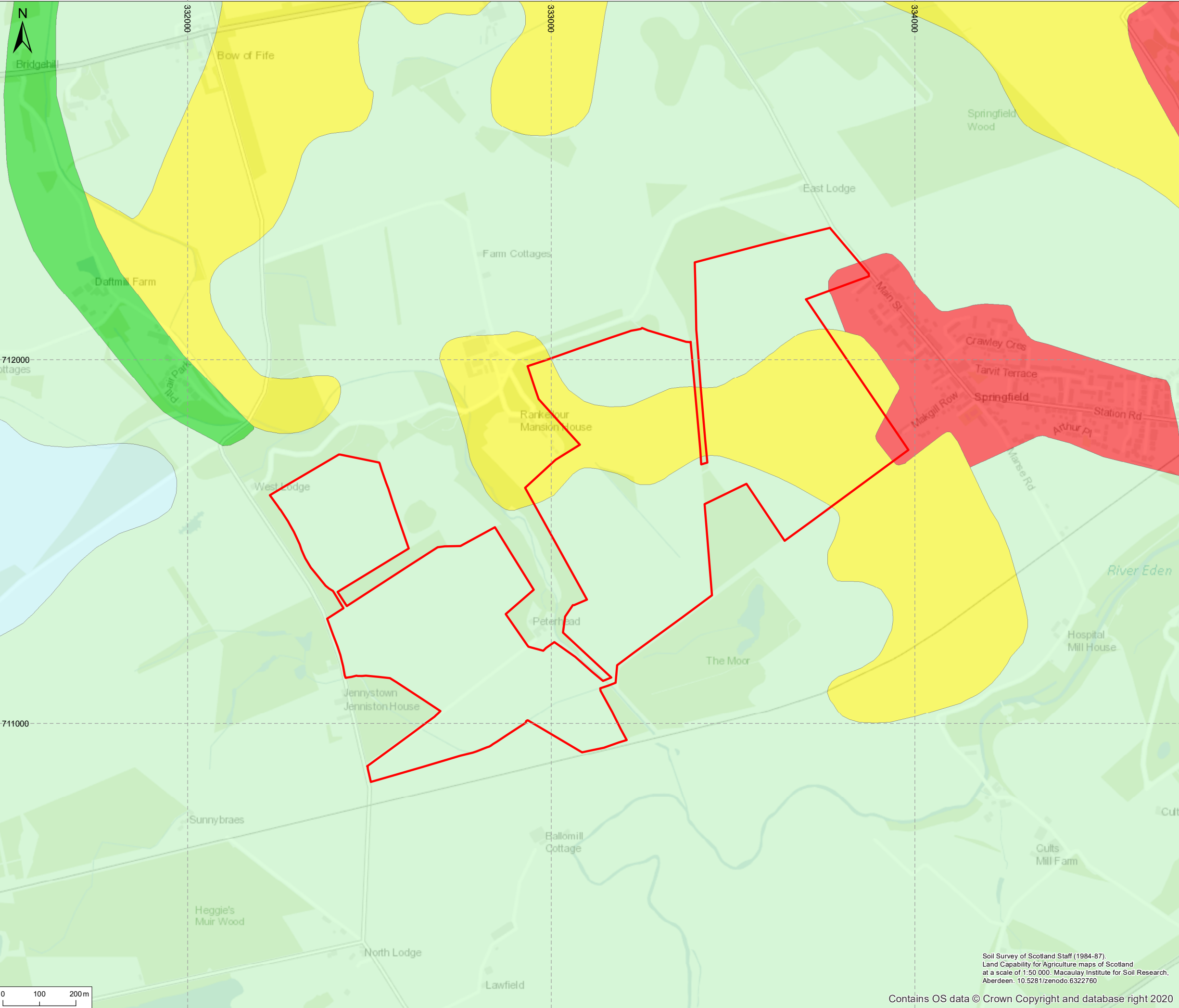
- 8.9 There appears to be only one solar and two BESS proposed developments within 5km of the Cupar substation where there would be a limited cumulative effect on agricultural land quality or farming productivity.
- 8.10 In relation to Grade 2 prime land (and the requirement for justification on the benefits the development would have to demonstrate why the land should be taken out of full agricultural use) and as discussed in Section 7 the land would be used for sheep grazing during the operational period which would also offer potential benefits to soil health through the increase in soil organic matter, improvement in soil structure and improvement in the biological function of the soil. These would offer benefits to the potential productivity of the land following the decommissioning of the solar array.
- 8.11 Undeveloped areas of the wider 103ha Site should be retained for agriculture where possible, with any areas subject to temporary development (access tracks, construction compounds etc.) to be restored to agricultural use following construction.
- 8.12 For the temporary development areas (and the BESS and substation area) a soil management strategy should be produced pre-construction to ensure that soils are stripped and restored in accordance with recognised best practice. This aims of the strategy would be:
- the conservation of soil resources;
 - the avoidance of damage to soil structures;
 - the maintenance of soil drainage; and
 - the reinstatement of the soil profile to as near as possible its former condition.

-
- 8.13 The plan would include proposals for:
- the management and supervision of the soil handling process.
 - a summary of soil types to be affected within the Site.
 - soil stripping and soil placement operations and procedures to be adopted.
 - the control of suitable conditions for soil handling which would provide a description of the control measures and tests which would be used to determine if and when soil handling can take place.
 - re-using soils stripped from the BESS and substation footprint (within restored temporary development areas or across the wider Site to improve agricultural soil conditions).
- 8.14 By implementing suitable soil handling practices during the construction (and decommissioning to a point) of the development, the potential for loss or damage to soil resources or soil quality on the Site would be reduced, as far as possible.
- 8.15 On this basis, the use of this land as a Solar PV and BESS development is consistent with both National and Local Policy, as measures would be taken to protect the agricultural quality resource within the Site.



Drawing 1 LCA Partial Mapping

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Legend

Site Boundary

Land Capability for Agriculture Classes
(area within site boundary)

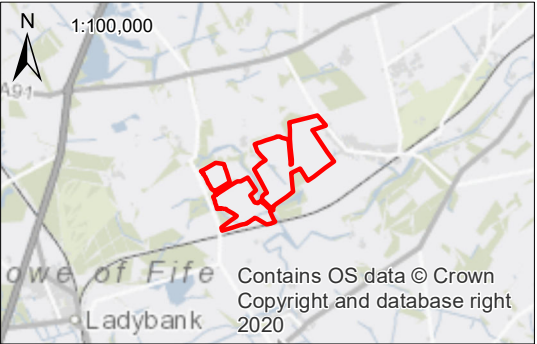
2 (25.18 ha)

3.1 (76.56 ha)

3.2

4.1

Built-up area (1.02 ha)



Rev	Description	By	CB	Date



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Project Rankeilour Solar & BESS

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Soil Survey of Scotland Staff (1984-87).
Land Capability for Agriculture maps of Scotland
at a scale of 1:50 000. Macaulay Institute for Soil Research,
Aberdeen: 10.5281/zenodo.6322760

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PETERHEAD SOLAR PHOTOVOLTAIC (PV) AND ENERGY STORAGE FACILITY

Land Capability for Agriculture (LCA) Assessment

2024-10-07

794-NI-P&E-NI2584

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