



Little Crow

Solar Park

Little Crow Solar Park, Scunthorpe

ENVIRONMENTAL STATEMENT: TECHNICAL APPENDICES

APPENDIX 4.4

OUTLINE SOIL MANAGEMENT PLAN

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OUTLINE SOIL MANAGEMENT PLAN

LAND TO THE EAST OF THE STEELWORKS, SCUNTHORPE

ON BEHALF OF INRG SOLAR (LITTLE CROW) LTD

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1. INTRODUCTION

- 1.1 This Outline Soil Management Plan has been prepared by Daniel Baird Soil Consultancy Ltd ('Baird Soil') on behalf of INRG Solar (Little Crow) Ltd and accompanies an application under Section 37 of the Planning Act 2008 to the Secretary of State for a Development Consent Order for Little Crow Solar Park.
- 1.2 The main element of the proposal is the construction, operation, maintenance and decommissioning of a ground mounted solar park and associated development with an intended design capacity of over 50MWp (megawatts peak). An operational lifespan of 35 years is sought for each element.

2. Aims

- 2.1 The aim of the Outline Soil Management Plan is the preservation of the soil resource at the site - avoiding both the loss of soil material from the site and the loss of functional capacity for agricultural production of soil at the site.

3. General Principles

- 3.1 Key threats to the soil resource at construction sites are trafficking of vehicles/plant and incorrect handling, which can cause damage to soil structure through compaction and smearing. These effects compromise the ability of the soil to perform its functions, such as providing adequate amounts of water, air and nutrients to plant roots. The risk of compaction and smearing increases with soil wetness. To minimise the risk of damage to soil structure, the generic guidance for construction sites is as follows:
- no trafficking of vehicles/plant over in situ or banded soils to occur outside demarcated working areas;
 - no trafficking of vehicles/plant on reinstated soil (topsoil or subsoil);
 - where practicable establish and maintain a grass sward over the Solar Panel area before trafficking over by construction plant and delivery vehicles;
 - where practicable soil handling when soil moisture content is above the plastic limit (the moisture content at which soil begins to behave as a plastic material and the soil is deemed too wet to handle without causing damage to the soil structure), will be avoided. Where operational constraints require

the disturbance of plastic soil material, suitable remediation should be specified for instance the wind rowing of loose tipped material;

- soil handling should be by excavator and dump truck as per sheets 1 to 4 of the Defra Good Practice Guide for Handling Soils¹;
- avoid handling of soils being carried out during periods of prolonged, heavy rainfall;
- no mixing of topsoil with subsoil, or of soil with other materials;
- soil only to be stored in designated soil storage areas;
- plant and machinery only work when ground or soil surface conditions enable their maximum operating efficiency (i.e. when machinery is not at risk of being bogged down or skidding causing compaction or smearing);
- all plant and machinery must always be maintained in good working condition to ensure that the soil is stripped correctly, for example to ensure that the depth of the strip can be accurately controlled, and to minimise the risk of contamination through spillages; and
- daily records of operations undertaken, and site and soil conditions should be maintained during soil handling activities;
- low ground pressure (LGP models) and tracked vehicles should be used where possible when working directly on bare or vegetated soils to minimise the extent and/or intensity of the soil loosening/decompaction required after reinstatement

3.2 The Plastic Limit can be assessed in the field. Soil is in a plastic condition when it is moist enough to be rolled between hand and a smooth surface (metal plate or ceramic tile) into a roll of 3.2mm (1/8 inch) thickness. If the soil crumbles before reaching this thickness it is not plastic. Once a plastic consistency has been reached following rainfall, work should be suspended until the soil has dried sufficiently to no longer be plastic.

3.3 The majority of the proposal will comprise rows of solar panels mounted over grazed pasture. There will be no requirement to move or seal soil below foundations for this land. Therefore, the risks to the soil resource are minimal

compared to minerals extraction or built development of a similar size. Furthermore, the permanent green cover will enable a greater exploitation of the soil profile by plant roots than can occur with annual arable crops, improving structural development and permeability in the subsoil.

4. Pre-Work Condition

- 4.1 The majority of the Order Limits is arable land, subject each year to a succession of cultivation passes and trafficking by high axle load vehicles such as grain trailers and combine harvesters. Topsoils are predominately light textured (sandy) and resilient to structural damage. Exposed soil is however vulnerable to wind and water erosion, and light subsoils are liable to deep compaction under heavy traffic when moist.
- 4.2 Prior to beginning work of the solar panel deployment and development of the associated infrastructure dense vegetated cover should be established to eliminate areas of bare soil. The seed mix for this sward should be selected with reference to the biodiversity management plan for the development.

Elements of Development

- 4.3 The most extensive component of the development is the Solar panels on mounts over grassland (Work No. 1: Arrays of Ground Mounted Solar Panels). Mounts are secured by pushing support posts into the ground, or by concrete weights securing the support posts. The concrete weights will be required in the archaeological sensitive areas.
- 4.4 The development will include a small compound for the substation, switchgear housings and associated facilities, with an access track (Work No. 2A and 2B: Battery Energy Storage System; Work No 4: Substation Building and Compound; Work No. 5: Upgrade to Main Track and Work No. 7: Temporary Construction and Decommissioning Compound).
- 4.5 Cabling for the development will be laid in trenches (Work No. 3: Formation of Ecological Corridors). A perimeter security fence will also form part of the development. Cable trenches will be back filled with soil.

5. Recommendations

Switchgear Compound and Tracks

- 5.1 For Work No. 2A, 2B, 4, 5 and 7, topsoil should be stripped separately from the underlying subsoil to avoid the topsoil being covered by tracks, hard standings and structures. For the access tracks the topsoil can be thinly spread to the side of the track from where it can be recovered when the track is decommissioned. For the larger switchgear compound the topsoil should be stored in a bund not exceeding 4m high.
- 5.2 Track and compound hard standing surfaces should be laid over the subsoil with a separating geotextile membrane. Drains can be laid below the track and hard standing where appropriate, for instance where there is the need to intercept a spring line.
- 5.3 Topsoil should be stripped from the footprint of the switchgear and associated buildings and stored in a bund.
- 5.4 Where subsoil needs to be stripped to achieve a desired level, it should be handled and stored separately to topsoil in bunds of up to 5m height. Stripped subsoil can be used to build up levels within the site but should not be spread without topsoil having been stripped from the receiving area first.
- 5.5 Soil handling work should not commence until the soil has dried to below the plastic limit. Work should be suspended for rainfall. If the rainfall is sufficient to wet the soil to a plastic consistence then work should not restart until it has dried sufficiently to return to a friable consistence.

Cable Trenches and Fence Posts

- 5.6 During the excavation of the cable trenches, topsoil and subsoil should be separated, and later replaced in order when backfilling the trench. Where there is excess soil material to backfill, the level should be maintained by removing subsoil and returning all of the topsoil.
- 5.7 Where soil material is excavated for post holes, topsoil should be spread thinly to the side of the excavation, with subsoil removed to a storage bund or reused for building up levels.

Solar PV Rows

- 5.8 For Work No. 1, prior to starting work a green cover should be established. Plant working on the site should be low ground pressure vehicles, for instance using agricultural tractors and trailers to move materials off the access track routes rather than road going HGVs.
- 5.9 Trafficking of plant and vehicles off the access tracks should not commence until the soil has dried to below the plastic limit. Work should be suspended for rainfall. If the rainfall is sufficient to wet the soil to a plastic consistence then work should not restart until it has dried sufficiently to return to a friable consistence. Where wheel ruts or other signs of surface compaction do arise, these should be remediated by using an excavator to lift and loose tip the topsoil before reseeding. This should take place at the completion of the construction works once all plant and vehicle passes have been completed.

Decommissioning

- 5.10 Removal of the solar panels and associated facilities will involve trafficking of vehicles over the grassed soil surface. Such work should only take place when the topsoil is below (drier than) the plastic limit.
- 5.11 Following removal of any hard standings such as switchgear housings and access tracks, the newly exposed subsoil should be loosened then lightly consolidated by a toothed excavator bucket to a depth of 30cm prior to the replacement of topsoil. A grass cover should then be established and the land maintained under grass (grazed or mowed) for three years prior to any return to arable production. An aftercare period will not be necessary for the majority area where soil has remained in situ as the extended period of time under grass should leave the soil profile in better structural condition than that found under the current arable production.
- 5.12 On completion of decommissioning works the site should be inspected by a soil scientist to check for the presence of subsoil compaction, with particular focus on areas such as haul routes over in situ soil and the locations of livestock troughs and handling pens. The landowners should be encouraged to inspect the site themselves prior to the soil scientist visit to highlight any areas where they have heightened concern.

5.13 Where problematic compaction is found the area should be subsoiled prior to any reestablishment of arable production.

ⁱ Defra Good Practice Guide for Handling Soils
<https://webarchive.nationalarchives.gov.uk/20090317221756/http://www.defra.gov.uk/farm/environment/land-use/soilquid/index.htm>

