OUTER DOWSING OFFSHORE WINDFARM

T.H. CLEMENTS & Son Limited (Interested Party Number 20049059)

POST HEARING SUBMISSION – SUMMARY OF ORAL SUBMISSIONS MADE AT ISH3: ONSHORE ENVIRONMENTAL MATTERS

INTRODUCTION

1. The following persons appeared on behalf of T.H. Clements at ISH3:

   (i) Mark Westmoreland Smith KC, Francis Taylor Building;

   (ii) Fiona Barker, Solicitor and a Principal Associate at Mills & Reeve LLP, T.H. Clements' lawyers;

   (iii) Dr Iain Gould, Associate Professor in Soil Science at the Lincoln Institute for Agri-Food Technology at the University of Lincoln (whose CV is at App.2 to T.H. Clements' Written Representation **[REP1-050]**);

   (iv) Daniel Jobe, Partner at Brown & Co Property & Business Consultants LLP, Land Agents to THC (whose CV is at App.3 to T.H. Clements' Written Representation **[REP1-050]**); and

   (v) Damian Pawson, Technical Director on Air Quality at Sweco UK Limited (whose CV is at App.4 to T.H. Clements' Written Representation **[REP1-050]**).

2. T.H. Clements contributed to Agenda Item 3.8: Land Use, Geology and Ground Conditions at ISH3.

SUBMISSIONS

Agricultural Land Classification ("ALC") and soil surveys

3. T.H. Clements does not suggest a need for ALC soil surveys in order to further assess the impact of the proposed development prior to determination.

4. T.H. Clements confirmed that its concerns in relation to ALC and soil surveys related to pre-condition soil surveys and restoration to the identified pre-condition post construction.

5. The two key points in this regard are that:

   (i) ALC categorisation does not fully represent the true quality and value of some of these soils. ALC is a broad brush approach. Much of the cable route runs through Grade 1 soils *but* within Grade 1 categorisation there is a spectrum of quality and soil properties. For the purposes of handling, stockpiling/storage and re-instatement, the soil should not be treated as simply 'Grade 1 soil'. Soil-handling should be based on more granular field-specific survey data and lab testing (see **[REP2-079, p.29-31 and p.56-57] and** T.H. Clements' Responses to ExA First Written Questions Q1 LU 1.12 and Q1 LU 1.13 and App.2). If soils are handled and re-instated back simply to their ALC grade , taking no account of site-specific soil conditions, then the marketable yield of specific fields may be adversely affected; and

(ii) Pre-excavation/construction soil surveys need to factor in any variation in agronomic properties in soil horizons (not simply a 'topsoil' and a 'subsoil') in order for reinstatement to mimic original condition as closely as possible. In some fields, this may mean two agronomically different layers. However, in some areas there may be multiple horizons within the excavation zone (see soil testing for Foxholes where three layers within 1 metre were found (**[REP2-079, p.29-31 and p.56-57]** and T.H. Clements' Responses to ExA First Written Questions Q1 LU 1.12 and Q1 LU 1.13 and App.2). These should be handled, stockpiled and re-instated separately or risk inconsistent soil conditions upon re-instatement, leading to inconsistent crop and significant impact on marketable yield.

6. T.H. Clements confirmed that these issues could be addressed through the Outline Soil Management Plan ("oSMP") and that the Applicant had provided a word version of the oSMP so that T.H. Clements could comment directly upon it. T.H. Clements undertook to provide those comments by Deadline 3 **[AP19, ISH3]**.

<u>Working width of the cable corridor</u>

7. T.H. Clements confirmed that in relation to the working width of the cable corridor it had raised the issues it was concerned with in CAH1 namely: first, how the soil storage areas within the cable corridor have been calculated and whether those areas are justified by such calculations; and, secondly, whether the same width of soil storage can be justified alongside those (fairly numerous sections) that are proposed to be installed using trenchless techniques (which will produce less soil requiring storage), i.e. can 80m in fact be justified in areas where trenchless techniques are employed. This summarised in T.H. Clements' summary of oral submissions at CAH1.

<u>Cable burial depth</u>

8. The ExA noted that the Applicant will respond in full to T.H. Clements written representation with regards to sinking farm machinery (see **[REP1-050, p.58-60, §§4.3.8-4.3.15 and App.11 and 12]** (which show that due to the nature of the soils, it is not uncommon for standard agricultural machinery to sink in to depths at or near the cable (1.2m) (with some machinery that has capacity to sink further (up to 2m)) and as such there is a risk of conflict with the cable). Given that the Applicant is yet to respond, this issue was deferred to later in the examination.

9. T.H. Clements noted that the Applicant had criticised T.H. Clements' photographic evidence on this issue (see **[REP2-051, p.121]** Applicant's response to Q1 LU 1.17) on the basis that it either did not show T.H. Clements machinery or it did not relate to the area through which the onshore cable route passes. T.H. Clements pointed out that these images were by way of illustrating the types of machinery used by T.H. Clements and the sinking of such machinery and not designed to be location specific, but that in light of the criticism T.H. Clements will provide specific imagery.

10. T.H. Clements further explained that drainage formed the other aspect of its concerns in relation to cable depth. The issue is explored in T.H. Clements' Written Representation **[REP1-050, p.54-**

58, §§4.3.1-4.3.7] as well as its response to the first written questions **[REP2-079, p.32-33]**. There are two aspects to T.H. Clements' concerns on drainage:

(i) Trenching: the soils on the Lincolnshire Fens can be prone to surface waterlogging following heavy rainfall. For a quality marketable yield of high value crops it is imperative to remove this water asap. To do this T.H. Clements carries out trenching, i.e. excavating a trench of 1m+ depth in the affected area to rapidly drain off any surface water. Again, this activity may conflict with installed cable depth. Furthermore, the instances of waterlogging may be exacerbated by the soil handling (stockpiling and re-instatement) of these non-self structuring, slumping prone silts. This may call for increased trenching operations in future.

(ii) Impact on drainage systems: this point was dealt with under a specific agenda item on this issue.

Potential effects on agriculture and soils during construction and/ or operation and related mitigation

11. This topic encompassed a number of sub-issues. They were listed in the Agenda as follows: dust contamination; stone contamination; agricultural drainage; severance; soil heating; organic farming; ground stability and earth movement; and soil aftercare and restoration.

12. T.H. Clements did not make submissions on ground stability and earth movement or organic farming. The remaining issues are addressed in the order they were dealt with at ISH3.

Agricultural drainage

13. Dr Iain Gould explained that there are three elements to T.H. Clements' concerns on drainage: first, impacts on current drainage systems; secondly, T.H. Clements' ability to clean drains in future; thirdly, if new drainage schemes are installed, the need to remove any previous schemes.

14. The fields farmed by T.H. Clements have existing drainage systems within them. There are outfall pipes which are below 1.3m depth which demonstrates that there will be instances of conflict with the installation of the proposed cable infrastructure. If the installation cuts through existing drainage schemes there is a commitment to re-install. However, it is critical that re-instatement factors in the ability to clean these drains in future. Silt soils are very prone to running silts which clog drains, and farmers are required to regularly maintain drainage schemes by jetting them (see **[REP1-050, App.6]**). Jetting operations need a long straight main drain that can be accessed from the outfall. If re-instatement of drains has formed junctions, bends, or new herringbone structures, this will inhibit the ability to jet drains clean. This risks compromising not only the drainage capacity of soils in the pipeline footprint, but also any drained soils uphill of the pipeline footprint, and potentially large areas of field. The impact will be more severe where drains run at right angles to the pipeline footprint (e.g. Foxholes field (see **[REP1-050, p.56]**) (i.e. more drains will be impacted). This could have significant impact on marketable yield.

15. If new drainage schemes are installed as part of the re-instatement operation, it is critical that any components of the old schemes are completely removed from the field. If not, this could lead to legacy effects of older pipes draining water away from the new scheme (and outfalls) and into areas of the field that are not serviced by drains. Again, this could have significant impact on marketable yield.

16. T.H. Clements has noted the Applicant's commitment to install the cables 300mm below any existing drainage systems. That is welcomed and T.H. Clements will wish to see that commitment is properly secured.

Severance

17. This issue is addressed in T.H. Clements Written Representation **[REP1-050, p.18-21]** as well as its response to the first written questions (Q1 LU 1.5) **[REP2-079, p.13-27]** (which answer sets out the land that T.H. Clements estimates will be affected by severance, i.e. become impractical to farm). It was noted that the Applicant confirmed that its estimate of such land was broadly similar.

18. T.H. Clements confirmed that it had seen the Applicant's response to Q1 LU 1.5 **[REP2-051, p.110]** which refers to a management plan for severed land and that T.H. Clements was broadly content with that approach. However, the approach is reliant on an agreement being reached and T.H. Clements and the Applicant are not yet in that position.

19. The ExA asked T.H. Clements if it was content with the current drafting of section 5.13 of the outline Code of Construction Practice **[Rep2-030, p.30]**. T.H. Clements confirmed that it would liaise with the Applicant to ensure the wording in the outline Construction Management Plan was appropriate, but the same point remains as it is currently drafted – it relies on agreements outside of the oCCP which will not be secured by the Order.

20. Furthermore, even where a severance management plan is in place, it will not remove the impacts or the requirement for compensation for either the inability to farm severed land or loss of profit on less valuable crops/ higher costs associated with farming that land.

Dust contamination

21. The ExA noted the mitigation proposed in Table 2.1 of the Air Quality Management Plan. The ExA asked whether T.H. Clements (amongst others) were content with that approach.

22. T.H. Clements responded, firstly, by noting that it had submitted a detailed technical report on dust dispersion **[REP1-050, p.21-53 and Appendix 14]** and that whilst there had been an initial response from the Applicant **[REP2-051, p.114-116]** (to which Mr Pawson confirmed he had clear answers), the Applicant is proposing to respond to Mr Pawson's report in detail at Deadline 3. Accordingly, this is a technical area that is still developing between the parties and in that context it would be more efficient to let the experts' (constructive) dialogue continue and report back later in the examination. T.H. Clements noted that this may be an area where a statement of comment ground between the Applicant and T.H. Clements on dust dispersion would assist the examination.

23. Mr Pawson said with regards mitigation specifically that his modelling exercise had assumed that the proposed mitigation works fully and from day 1 (in particular, the wetting down of dust emission sources and seeding of soil stockpiles). Even on that assumption, the assessment indicates that there is a high risk of visible dust impact across approximately 100 hectares of land farmed by T.H. Clements adjacent to the Order land. On that basis, there is a requirement to go further than the mitigation proposed in the Air Quality Management Plan. Mr Pawson confirmed he is in on going and constructive discussion with the Applicant's relevant expert.

Stone contamination

24. This issue is addressed in T.H. Clements Written Representation **[REP1-050, p.18-21]** as well as its response to the first written questions (Q1 LU 1.11) **[REP2-079, p.29]**.

25. It was agreed at ISH3 that the issue could be deferred on the basis of on-going discussions between T.H. Clements and the Applicant.

<u>Soil heating</u> **[Q1 LU 1.16]** [Dr Iain Gould]

26. This issue is addressed in T.H. Clements Written Representation **[REP1-050, p.60-61]**.

27. Again, it was agreed at ISH3 that the issue could be deferred on the basis of on-going discussions between T.H. Clements and the Applicant. However, T.H. Clements indicated that it had not been able to locate the papers relied on by the Applicant in its response to Q1 LU 1.16 **[REP2-051, p.119]** and would be seeking help from the Applicant to provide copies of the same.

28. T.H. Clements also indicated that those papers (so far as could be discerned from the Applicant's reliance on them) related to impacts on overall yield. That is not T.H. Clements' concern. Rather, the concern relates not to overall yield but harvestable yield. Any elevated heat from cable installation will impact on soil biological and chemical processes and drying rates which can affect the rate of germination, nutrient cycling, cultivation potential and ultimately crop growth and development. If one area of a field (e.g. cable footprint) heats up quicker than the rest, it will result in variable growth rates of crops. This may not be a prominent impact on some arable crops (e.g. combinables), however it could have a significant impact on the harvestability or harvest costs of vegetables and marketable yield if they come to marketable quality at different rates.

29. T.H. Clements will respond to the Applicant's position when it has been provided the papers on which the Applicant relies.

<u>Soil aftercare and restoration</u>

30. T.H. Clements dealt with this issue in response to the first written questions LU 1.12 and 1.13 **[REP2-079, p.29-31 and p.56-57]**. Ultimately, this issue is about the detail in the oSMP and ODOW have provided TH Clements with a word document on which it is going to provide track change comments by deadline 3. On this basis, this issue was again largely deferred.

31. The key issues from T.H. Clements' perspective are:

    (i) Pre-excavation soil survey needs to factor in any variation in agronomic properties in soil horizons (not simply a 'topsoil' and a 'subsoil') in order for reinstatement to mimic original condition as closely as possible. In some fields, this may mean two agronomically different layers. However, in some areas there may be multiple horizons within the excavation zone (see soil testing for Foxholes where we found three different layers were identified within one metre of depths (**[REP2-079, p.29-31 and p.56-57]** – T.H. Clements Responses to ExA First Written Questions Q1 LU 1.12 and Q1 LU 1.13). These should be handled, stockpiled and re-instated separately or risk inconsistent soil conditions upon re-instatement, leading to inconsistent crop and significant impact on marketable yield.

    (ii) For this reason, for the purposes of handling, stockpiling and re-instatement, soils should not be treated as simply 'Grade 1 soils'- they should be treated based on more granular field-specific survey data and lab testing. If soils are handled and re-instated back simply to their ALC grade (see stone content as an example), having to regard to their site-specific soil conditions, then there will be more risk of inconsistency across a field which will compromise marketable yield.

(iii) With regards stone contamination, again, it is insufficient to restore to ALC Grade 1. Stone content will impact on vegetable production, hindering cultivations and blunting machinery. It is also very important with regards the prepared products that T.H. Clements produces which involve slicing vegetables straight off the fields and without washing prior to their packaging and onward sale to customers. These products are effectively field to plate and stone contamination must be avoided. The soils farmed by T.H. Clements have very low stone contents (~<1% vol.). ALC Grade 1 categorisation can go up to 5% volume, which is potentially 5x more stones than existing. It is therefore critical that stone content of re-instated soil is at the same levels as the pre-excavation/survey survey. Otherwise, there would be adverse impacts on cultivation (note: T.H. Clements grows premium quality potatoes based on stone free land (for which there is a minimum of 10-20% premium that is attributable to the stone free nature of the soil) and costs.

Outer Dowsing Offshore Wind

Outline Documents

8.1.3 Outline Soil Management Plan

Date: December 2024

[Manager]
Pursuant to APFP Regulation: 5(2)(q)
Rev: 2.0

Company:	**Outer Dowsing Offshore Wind**	Asset:	**Whole Asset**
Project:	**Whole Wind Farm**	Sub Project/Package:	Whole Asset
Document Title or Description:	8.1.3 Outline Soil Management Plan		
Internal Document Number:	PP1-ODOW-DEV-CS-PLA-0015_02	3rd Party Doc No (If applicable):	N/A

Rev No.	**Date**	**Status / Reason for Issue**	**Author**	**Checked by**	**Reviewed by**	**Approved by**
1.0	February 2024	DCO Application	SLR	GoBe	Shepherd and Wedderburn	Outer Dowsing
2.0	September 2024	Procedural Deadline 19 September	SLR	Outer Dowsing	Shepherd & Wedderburn	Outer Dowsing

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Acronyms & Terminology

Abbreviations / Acronyms

ALC	Agricultural Land Classification
ALO	Agricultural Liaison Officer
CMS	Construction Method Statement
CoCP	Code of Construction Practice
DCO	Development Consent Order
Defra	Department for Environment Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero, formerly Department of Business, Energy and Industrial Strategy (BEIS), which was previously Department of Energy & Climate Change (DECC)
ECC	Export Cable Corridor
ES	Environmental Statement
HSSE	Health, Safety, Security and Environment
HVAC	High Voltage Alternating Current
IDB	Internal Drainage Board
LCC	Lincolnshire County Council
LPA	Local Planning Authority
MLWS	Mean Low Water Springs
NSIP	Nationally Significant Infrastructure Project
ODOW	Outer Dowsing Offshore Wind
OLEMS	Outline Landscape and Ecological Management Strategy
OnSS	Onshore Substation
PEIR	Preliminary Environmental Information Report
PPEIRP	Pollution Prevention and Emergency Incident Response Plan
SCoW	Soil Clerk of Works
SMP	Soil Management Plan
TC	Temporary Compound

Terminology

Term	Definition
400kV cables	High-voltage cables linking the OnSS to the NGSS.
400kV cables corridor	The 400kV cable corridor is the area within which the 400kV cables connecting the onshore substation to the NGSS will be situated.
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, Tota Energies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The Project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), Total Energies and GULF.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP) from

Term	Definition
	the Secretary of State (SoS) for Department for Energy Security and Net Zero (DESNZ).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of an impact with the sensitivity of a receptor, in accordance with defined significance criteria.
Haul Road	The track within the onshore ECC which the construction traffic would use to facilitate construction.
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Joint bays	An excavation formed with a buried concrete slab at sufficient depth to enable the jointing of high voltage power cables.
Landfall	The location at the land-sea interface where the offshore export cables and fibre optic cables will come ashore.
Lower Plastic Limit	The water content at which a soil changes from the plastic state to a semisolid state.
Mitigation	Mitigation measures are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects
Onshore Export Cable Corridor (ECC)	The Onshore Export Cable Corridor (Onshore ECC) is the area within which the export cable running from the landfall to the onshore substation will be situated.
Onshore substation (OnSS)	The Project's onshore HVAC substation, containing electrical equipment, control buildings, lightning protection masts, communications masts, access, fencing and other associated equipment, structures or buildings; to enable connection to the National Grid
Outer Dowsing Offshore Wind (ODOW)	The Project.
Order Limits	The area subject to the application for development consent, the limits shown on the works plans within which the Project may be carried out.
Preliminary Environmental Information Report (PEIR)	The PEIR was written in the style of a draft Environmental Statement (ES) and provided information to support and inform the statutory consultation process during the pre-application phase.
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.

Reference Documentation

6.1.3	Project Description
6.1.23	Geology and Ground Conditions
6.1.25	Land Use
8.1	Outline Code of Construction Practice
8.1.4	Outline Pollution Prevention and Emergency Incident Response Plan
8.1.5	Outline Surface Water and Drainage Strategy
8.10	Outline Landscape and Ecological Management Strategy

1 Introduction

1.1 Purpose of this Outline Soil Management Plan

1. This Outline Soil Management Plan (Outline SMP) is provided as part of the Outline Code of Construction Practice (CoCP) (document reference 8.1).
2. The Outline SMP, by reference to the assessments reported in the Environmental Statement, sets out the key elements that will be included in the detailed SMP which the Applicant will be required to submit to the relevant Local Planning Authority (LPA) in consultation with Lincolnshire County Council (LCC) for approval prior to commencement of construction.
3. This Outline SMP sets out the principles and procedures for general good practice mitigation for soil management during the onshore construction works to minimise the adverse effects on the nature and quality of the soil resource. It should be read in conjunction with the Outline CoCP and the assessment of the Project's impacts on ground conditions (Volume 1, Chapter 23: Geology and Ground Conditions (document reference 6.1.23)).

1.2 Scope of this Outline SMP

4. The controls and management measures presented in this Outline SMP apply to all soils within the Order Limits, unless otherwise stated. This includes the Landfall, the Onshore Export Cable Corridor (ECC), 400kV cable corridor and the Onshore substation (OnSS).
5. For the avoidance of doubt, this Outline SMP relates to the onshore elements of the Project only (i.e., landward of Mean Low Water Springs (MLWS)). This document does not relate to offshore works.
6. This Outline SMP is based upon guidance contained in the Department for Environment, Food and Rural Affairs' (Defra's) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009); the Institute of Quarrying, Good Practice Guide for Handling Soils (2021); and professional experience.

1.3 Other Control and Management Plans

7. Additional management plans that are relevant to soils are listed below which are submitted as part of the Development Consent Order (DCO) application.
   - Outline Pollution Prevention and Emergency Incident Response Plan (PPEIRP) (document reference 8.1.4);
   - Outline Surface Water and Drainage Strategy (document reference 8.1.5);
   - Outline Landscape and Ecological Management Strategy (OLEMS) (document reference 8.10).

1.4 Review and Update of the Outline SMP

8. Prior to construction, site and soil-specific measures will be set out in a the final SMP, based upon this Outline SMP, and will be supplemented by survey data where required.

9. The CoCP and SMP will be submitted to the relevant Local Planning Authority (LPA) in consultation with LCC for approval prior to commencement of construction.
10. To secure effective delivery of the SMP, the contractor must implement the plan through the location-specific construction method statements. ‘Locations’ will be determined by the contractor and/or the Soils Specialist depending upon factors such as, but not limited to, the works to be undertaken, the machinery to be used, soil types and results of any additional survey works, and site constraints (for example, depth to water table, or ecological constraints).
11. The works must also be monitored to audit compliance with the SMP (and location-specific construction method statements) and to allow ongoing advice on soil handling to be provided.

2 Roles and Responsibilities

2.1 Overview

12. The effective implementation of the SMP requires that roles and responsibilities are clearly defined and understood. Specific job titles, roles and responsibilities will be defined by the Contractor. The contractor will appoint an Agricultural Liaison Officer (ALO), or similar, and a Soil Clerk of Works (SCoW) whose roles and responsibilities are expected to be similar to those described below, to manage soils.

2.2 Agricultural Liaison Officer

13. The ALO will ensure that the specifications of the SMP and site-specific construction method statements/soil management plans are implemented. It is envisaged that the ALO will have sufficient soil science experience or will work in cooperation with the SCoW with soil science capability. The main duties of the ALO will comprise, but will not be limited to:

- liaison between the Contractor, Landowners and the Applicant;
- assessment of the soil condition before, during and after the works using tactile and visual methods;
- assessing compliance of the work on site with the SMP;
- signing off the quality of reinstatement (of soils) to allow for the commencement of the aftercare;
- ensuring the adequacy of the detailed aftercare programme and its annual updates (if required);
- soil sampling and production of annual aftercare reports; and
- signing off completion of the aftercare.

2.3 Soil Clerk of Works

14. The main duties of the SCoW will comprise, but will not be limited to:

- providing advice with respect to construction activities and their interface with respective technical areas of expertise;
- undertaking any necessary pre-construction soil surveys and supervising the implementation of specific mitigation measures, where required;
- undertaking any required monitoring related to their specialism;
- providing reports and maintaining contact with relevant stakeholders, as required; and
- providing specific advice with respect to any issues that may arise.

2.4 Pre and Post Construction Surveys

15. Prior to and post construction, a competent person will be employed to ensure that information on existing agricultural management and soil/land conditions is obtained, recorded and verified by way of a detailed pre and post construction condition survey.

16. Agricultural Land Classification surveys (MAFF 1988), stone assessment as detailed within Hodgson, J 1997 Soil Survey field handbook will be conducted. Additionally, ~~and~~ British Standard Topsoil~~soil~~ testing to BS3882, and subsoil testing to BS8601 will be undertaken across the areas in which construction activities are proposed. Survey points will be made at least every ~~100m~~ 50m or in each field where the field is less than ~~100m~~ 50m in length. Distinct changes in the topsoil horizon (to texture, structure, organic matter levels or chemical/nutrient status) will be mapped, and such differing horizons are to be stored separate to each other, and reinstated relative to each other in order to replicate the pre-construction situation. Determination of the soil status will be by means of soil laboratory testing where sampling is done. Tests for soil nutrient (chemical) status, organic matter, biological activity and texture will be done at each sampling point, and these details recorded to form the basis for the reinstatement plan, and assessing its outcome. Additionally, to safeguard against seasonally induced changes to any measured parameter, sampling along the construction route at the frequencies outlined will be replicated at points in the field outside of the construction corridor just prior to reinstatement. Sampling depths will be at each sampling ~~point,~~apoint, a minimum of one per topsoil horizon, and one per the subsoil at a depth of 1.3m, or 0.3m below the deepest land drain depth recorded.

Commented [IG1]: Is this British Standard Topsoil Testing 3882 and Subsoil to BS8601?

Commented [IG2]: Will the survey accommodate presence of multiple topsoil horizons, which can be specifically stripped, stockpiled and re-instated separately?

Commented [IG3R2]: What methodology will be used to identified any differential horizons within the stripping depth?

17. As part of the condition survey, and in addition to addressing matters relating to soils and other factors including existing crop regimes, the position and condition of field boundaries, existing drainage of the soil, existing access arrangements and private water supplies (as far as reasonable investigations allow), the type of agriculture taking place, the yield of crops and the quality of grazing land will also be recorded. Liaison with affected landowners and tenants will be undertaken to identify potential constraints and barriers to construction and identify the provision of any temporary drainage requirements and/or drainage diversions.

18. Such aspects will be recorded (according to the position of varied soil horizons and entered into a pre-entry record of condition for the affected Landowner. This will be shared with the Landowner to confirm the presence of identified soil horizons. The commencement of construction will reflect agreements made with affected parties to minimise disruption, where possible, to existing farming regimes and timings of activities (e.g., cropping).

Commented [IG4]: How deep into a profile will these logs detail? If the expected burial depth then it is highly likely that multiple agronomically different soil horizons will be encountered, which need to be managed in separation.

Commented [IG5]: The landowner/stakeholder should have the consultation opportunity to confirm presence of identified horizons at each survey point

19. The SCoW will undertake routine site inspections during construction to monitor working practices and ensure landowners' and farmers' reasonable requirements are fulfilled. The SCoW will also retain a function with regards to agreeing reinstatement measures following completion of the works.

20. A full record of condition on a plot-by-plot basis will be undertaken including photo log, this will be produced to the landowner and signature gained as a true reflection of the land parcel both Pre and Post construction.

3 Coastal Soils of Lincolnshire

3.1 Overview

21. The coastal soils of Lincolnshire are developed in a large part in salt marshes and tidal flats reclaimed by sea walls, and form some of the best agricultural land in the UK. These are used extensively for large-scale vegetable growing in some areas. The soils are often in very complex patterns, reflecting the depositional environment of the saltmarshes, with their many tidal creeks; it is usual to have a number of soil types in a single field.
22. This land is subject to naturally shallow groundwater, the control of which is essential to the use of the land for intensive agriculture and horticulture. Groundwater levels are controlled by ditches and a pumped system, in an efficient arterial drainage system operated by the Internal Drainage Boards (Witham Fourth District IDB, Black Sluice IDB, South Holland IDB, Welland and Deepings IDB & and Lindsey Marsh IDB) to which landowners/Occupiers pay a drainage levy which allows them to discharge water from their land directly into either riparian ditches or the main internal drainage board water courses. Locally the majority of land under the internal drainage boards caption areas is of agricultural use.
23. The land within the Order Limits is entirely mapped as Grades 1 – 3. Due to the current scale of the published ALC mapping, it is not possible to differentiate between the sub-grades Grade 3a and Grade 3b, with only the overall Grade 3 present in the Natural England Provisional ALC maps. This is of relevance as Natural England describe best and most versatile land as Grades 1 – 3a, with Grade 3b not being considered best and most versatile land.
24. A high proportion of the land where the onshore ECC crosses, is of Grades 1 and 2 agricultural land quality (MAFF 1988), comprising marine 'silts'. The lighter soils are easily worked with machinery year-round, aided by agricultural land drainage with little serious groundwater influence (with maintenance of drainage measures) stone-free and have very large reserves of moisture available to sustain crop growth; these form the Grade 1 quality land. Some soils are slightly heavier, which reduces the workability and moisture holding capacity slightly and these give Grade 2 land.
25. Other land, mainly in the northern parts of the Order Limits, have heavy soils developed mainly in alluvial clays which limit the agricultural land grade to Subgrade 3a and 3b, mainly because of varying wetness due to clay loamy soils.
26. There are three published sources of soil information available for the Order Limits: the areas around Friskney and Wainfleet are covered by a detailed soil map published at 1:25,000 scale (Robson 1985); the areas around Weston Marsh are covered by a semi-detailed map published at 1:50,000 scale (Robson 1990). The whole area is covered by the National Soil Map (Hodge 1984) at 1:250,000 scale.

3.2 Running Soils

27. 'Fen Silt' or 'Marine Silt' are colloquial terms referring to the banded coarse material at the base of many soils in the fens and marshes of the flatlands derived from marine alluvium. Silt size particles are defined as 20-60 µm in diameter whereas the majority of the "marine silts" are actually dominated by fine sand (60-200 µm) fraction, often with a high percentage of very fine sand (60-100 µm). The clay content of the material is typically low (<5%), and the material tends to be weak and can cause difficulties in construction.
28. Digging in the material becomes difficult because the fine sandy material can 'run' into the excavation, so that the excavation becomes wider but no deeper. This is the phenomenon of 'running sand' and can often be caused if the excavation is below the water table (partly caused by pressure from moisture in the surrounds) but may also occur in loose dry non-cohesive material conditions, as in beach sands. The Construction of trenches in these materials will require detailed engineering design and processing to ensure that suitable construction methods and mitigation are in place.

3.3 Location of potentially unstable areas

29. The principal soil type where potentially unstable soils may occur is the Wisbech series: naturally groundwater-affected silt loams and fine sandy silt loams formed in marine alluvium. The soils of the fenland occur in very complex patterns so that Soil Associations[1] are used in all publications. Wisbech is typically 'associated' with fine silt and clay soils. The relevant Association as described on the National Soil Map4 is 812b: Wisbech Association. These are most commonly recorded in the southern part of the Order Limits south of Burgh-le-marsh and are extensive around Weston Marsh. They are associated with Grade 1 Agricultural Land Quality. The recorded extent of these soils[2] within the Order Limits is between Freiston and Weston Marsh.
30. Other soils in the south are fine silty types, like Tanvats Association (811e), which mainly give rise to grade 2 quality land. They are less likely to encounter the problem of 'running sands,' although there may be 'running sand' at depth (below the upper 1.2 m typically regarded as the soil layer) which would be encountered during cabling excavations.
31. Most of the land in the northern section of the Order Limits is recorded as alluvial clay soils of the Wallasea and Newchurch Series. There are areas of Wisbech soils associated with these main soil types, usually in very narrow strips on raised banks, and are less likely to give rise to the 'running sand' problems.

[1] Groups of soils formed in the same geology/landscape position which cannot be mapped separately at the given mapping scale.
[2] The published soil maps give an indication of likelihood only and are not sufficiently accurate for identification on a field-by-field basis.

3.4 Drainage

32. Soils in the area are artificially drained to control surface water and aid ground water levels, and groundwater is easily controlled in them by ditches and pumps in an efficient arterial drainage system operated by the IDB. Thus, the depth of the groundwater tables in the soils will depend on the pumping intensity and the time of year. The IDBs keep drain levels around 1m lower in the winter to allow capacity for drainage.

4 Onshore Construction Elements

4.1 Onshore ECC and 400 kV cable corridor

33. The working width of the Onshore ECC will typically be 80m wide and up to 70km in length. The 400kV Cable Corridor has a typical working width of 60m. This will allow for up to four cable trenches, temporary soil stockpiles, drainage, haul road and working areas around the cable trenches. The expected width of each cable trench at surface will be up to 5m.
34. Following cable trench excavation, a thin layer of thermal bedding sands such as cement bound sand will be packed around the ducts in order to aid heat dissipation. Subsoil and topsoil previously removed will then be backfilled and suitably compacted in sequence to the appropriate horizon depths to ensure land gradients remain as Pre project on a plot-by-plot basis this will be compared via pre and post surveys.

4.2 Onshore Substation (OnSS)

35. Construction of the OnSS will initially affect approximately 209,000m^2 of land comprising a substation footprint of up to approximately 144,000m^2 (in the event that an AIS substation is taken forward).

4.3 Temporary Construction Compounds

36. Temporary construction compounds of various sizes will be required at the Landfall, along the onshore ECC and 400 kV Cable Corridor, and at the OnSS location. Their use is described in ES Chapter 3 Project Description (document reference 6.1.3). Table 11~~Table 1~~ outlines the MDS parameters for the anticipated compounds.

Table 11~~1~~: Maximum design parameters for Landfall, onshore ECC & 400kV cable corridor temporary construction compounds

Parameters	Design Envelope
Landfall Primary Construction Compound [PCC-1]	
Maximum Total number	1
Maximum duration per compound (months)	51
A52 (Hogsthorpe) Primary Construction Compound (A52 Hogsthorpe PCC) [PCC-3]	
Maximum Total number	1
Maximum duration per compound (months)	51
Onshore ECC & 400kV Cable Corridor Primary Construction Compounds (PCCs)	
Maximum Total number	7
Maximum duration per compound (months)	36
Onshore ECC & 400kV Cable Corridor Secondary Construction Compounds (SCCs)	
Maximum Total number	20
Maximum duration per compound (months)	24
Onshore ECC & 400kV Cable Corridor Cable Installation Compound (CICs)	
Maximum Total number	324
Maximum duration per compound (months)	6

Parameters	Design Envelope
OnSS Primary Construction Compound (OnSS PCC) [PCC-29]	
Maximum Total number	1
Maximum duration per compound (months)	36[3]
OnSS Security & Logistics Compound [PCC-30]	
Maximum Total number	1
Maximum duration per compound (months)	36

37. Temporary construction compounds will be removed, and sites restored including agricultural land drainage to their original condition when the compound is no longer required.

4.4 Haul Road

38. A temporary haul road will be constructed within sections of the onshore ECC and 400kV cable corridor. It is assumed that there will be a requirement to import aggregates to create a stable surface for construction traffic movements. Other options such as bog-matting, trackway or geotextiles will also be considered, and employed where required. Vehicle passing points will be created to facilitate safe two-way traffic flow on the haul route.

Where the field stone content is leas than 5%, the contractor shall use stone-free options (as outlined in section 38) for making the hail roads stable, and suitable for traffic.

Commented [IG6]: Given that these are stone free soils as mentioned in 3.1, paragraph 24, it would be prudent to have a specific commitment to preventing any stone contamination from construction process. Techniques such as trackways as opposed to importing ballast would be much more suited to this.

[3] A portion of the OnSS PCC will be retained for an additional 15 months for commissioning works.

5 Soil Management

5.1 General Soil Handling Principles

39. Best practice measures will be implemented to avoid degradation and deformation during all phases of soil handling. The main threats to soil resources on construction sites are trafficking of vehicles and incorrect handling (Defra, 2009a). Trafficking and incorrect handling can damage the structure of the soils through over-compaction and contamination. These effects compromise the ability of the soil to perform its functions such as providing adequate air, nutrients and water to plant roots. To minimise the risk of degradation to soils, the following guidance will be adhered to during all soil handling tasks:
   - No trafficking of vehicles/plant or storage of materials to take place outside designated working areas. Heavy plant and vehicles to be restricted to specific routes;
   - The soils (topsoil and subsoils) will not unnecessarily be trafficked or trampled by vehicles, which will operate on the 'basal'/non-soil layer where possible;
   - No trafficking of vehicles or plant on reinstated soils (topsoil or subsoil);
   - Plant and machinery to 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 due to wetness);
   - Plant and machinery will be maintained in good working order; low ground pressure and tracked vehicles will be used where possible when working directly on bare or vegetated soils (this reduces the intensity of ground compaction);
   - Stripping areas are to be protected from in flow of water and ponding. Wet areas will be drained in advance of stripping;
   - Where practicable, soils will only be moved when they are in a dry and friable condition, based on field assessment of the soils' wetness in relation to its lower plastic limit;
   - Transportation of soils to be kept to the absolute minimum to reduce the risk of contamination between fields; and
   - ~~No m~~Mixing of topsoil with subsoil, or any other soil horizons (including multiple topsoil horizons), or of soil with other materials is not allowed.

Commented [IG7]: There may be multiple horizons beyond simply topsoil and subsoil, can there be a specific commitment in the oSMP to handle these separately?

40. The size of the earthmoving plant to be used will be tailored to the size of the area to be stripped, the space available within the working area, the volumes and haul distance. Long reach excavators, which will minimise the need for movement across the soil surface, and tracked vehicles, will be used where needed to reduce soil compaction.
41. The selection of appropriate equipment and work practices is important as mishandling of soil can have an adverse effect on its fertility, permeability, ecological diversity, and the performance and visual quality of vegetated areas. Mishandling can also increase the risk of flooding and off-site discharges.

42. Multiple handling of soil materials will be minimised.

43. The detailed SMP and location-specific construction method statements will be defined based on the results of the site investigation and soil survey reports, where available. The reports will specify the detail of the existing soil characteristics and the depths and properties of the topsoil and subsoil horizons. Each location-specific construction method statement shall include details of the methods of working, proposed site machinery and tillage equipment, materials and Health, Safety, Security and Environment (HSSE) requirements.

44. A pre-start meeting will be held with the relevant stakeholders to finalise and changes to the plans and sign off the location-specific construction method statements.

5.2 Management of 'Running Sand'

45. The following process is suggested for management of soils potentially subject to 'running sand' problems (See Section 3.2).

- Identify the likely areas where the 'running sand' problem is most likely to occur using ground investigation such as test boreholes, along with published soil maps and informed local opinion;
- A detailed soil survey of the route pre-construction at a minimum density of one investigation per ~~100m~~ 50m to identify the presence of silt soils and groundwater-affected soils;
- Use land-type specific engineering measures in these areas to ensure there is no risk of trench collapse, erosion or water pollution (as outlined below).

46. Engineering measures to be considered during construction:

- Avoid breaking into watercourses and ditches to keep any material from entering.
- Separate 'soil' (the upper 1.2m) from any underlying material and ensure that underlying material is replaced below the soil when trenches are filled. This would be most simply achieved by separating the upper 0.5m to 1.0m of subsoil from any material below. Refer to point 16 for detailed background where multiple topsoil horizons are present, in order to maintain such horizons during and after reinstatement.

5.3 Adverse Weather

47. During certain weather conditions soil handling and movements must be effectively managed to reduce the risk of degradation and damage. Soil handling during adverse weather will adhere to the following criteria:

- During wet periods, mechanised soil handling in areas where soils are highly vulnerable to compaction will be ~~limit~~avoided as far as practicable. Where this is deemed impractical, the associated landowners and farmers will be consulted and their opinions taken into account when determining appropriate courses of action;
- If there is heavy and/or consistent rainfall (e.g., heavy showers or slow-moving depressions), the suspension of soil operations must be considered;

- If sustained heavy rainfall (e.g., >10mm in 24 hours) occurs, soil handling operations must be suspended. Soil operations must not restart ~~until the ground has had at least one full dry day or an~~ unless all interested parties agree that appropriate~~agreed~~ moisture criteria of the soil can be met (such as 'drier than the plastic limit') as advised by the SCoW;
- The working area should be protected against water ponding and inflow of water; and
- Additionally, soil should not be handled or trafficked when the ground is frozen or covered by snow.

48. When a rainfall event forces the suspension of soil handling operations, the soil profile within the active strip should be stripped to the basal layer (i.e., measured topsoil depth) before cessation of works. New active strip areas should not be started.
49. Before soil handling operations recommence, the weather forecast should be checked and works only recommenced if no further heavy rain is forecast during a period which would require stoppage part way through the stripping of an area. Soil moisture must be tested prior to recommencing to determine the appropriate methodology for handling.

5.4 Determining Soil Moisture

50. Soils should only be handled when dry and friable to avoid degradation and compaction. This may not be practicable for all soil handling operations due to the scale of the Project.
51. Soil moisture and condition should be tested prior to work recommencing. Methods for determining soil condition are set out as follows:
    - Step A - Attempt to roll a soil sample into a ball by hand; and
    - Step B - Attempt to roll ball into a 3mm diameter thread by hand.
52. If it is not possible to roll the soil into a 3mm diameter thread the soil will be determined to be below the plastic limit.
53. The appropriate methodology for handling and storage of the soils will be determined and approved via the final SMP based on the plasticity and the moisture content of the soils.

5.5 Site Preparation

54. Site preparation will include the demarcation fencing and signage of the designated access, working and storage areas as well as the removal of vegetation from within the work areas.
55. The working areas to be stripped of soils should be bare or only short surface vegetation should remain (<100mm). This can be achieved by mowing or strimming grassland/arable areas with the cuttings disposed of off-site at a suitably licenced green waste facility. Vegetation cuttings must not be added to or mixed with the soils as the presence of organic plant matter within the soils may cause anaerobic conditions as the plant matter degrades (rotting).

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56. Alternatively, the vegetation may be killed off by application of a suitable, Environment Agency approved, non-residual herbicide applied not less than two weeks prior to commencement of soil stripping operations at the location. Herbicide may only be used with the consent of the landowner and the Project would ensure that ALOs maintain communication with farmers/landowners to ensure their needs are understood before, during and after construction.
57. Hedgerows/trees will be felled, the tree stumps and associated large roots (>20mm diameter) will be removed using a suitable agreed method. All woody materials associated with the removal of the trees and hedgerows will be disposed of off-site at a suitably licenced facility. To reduce potential anaerobic conditions in the soils during stripping and storage, no woody materials including chippings will be incorporated into the soils during stripping.

5.6 Drainage

58. All existing land drainage records collated will form part of a full pre and post construction land drainage design along with topographical surveys and any historic landowner information to mitigate any issues of water ingress during construction and to keep the integrity of the existing system on the remaining parts of the field, allowing the Landowner/Occupiers to farm the remaining parts of the field through the construction period.
59. Each individual land parcel will be designed taking into consideration the existing use of the land and the Landowner's requirements.
60. Existing land drains, encountered during construction, will be appropriately marked. Temporary drainage will be installed within the working width to intercept existing field drains and ditches in order to maintain the integrity of the existing field-drainage system. Such measures will also assist in reducing the potential for attenuation of ground water form during the works, with a consequential impact on soil structure and fertility. Where necessary, existing land drains will be replaced to ensure continued, and consistent (with adjacent field areas not affected by construction activities) agricultural use.
61. Particular care will be taken to ensure that the existing land drainage regime is not compromised as a result of construction. Land drainage systems will be maintained during construction and reinstated on completion.
62. Pre-construction cut off drains will be installed to divert the existing land drainage away from the working easement this will allow the existing system to affectively perform on the high side of the easement as it has done pre-construction, the installation of a cut off drain will also mitigate water entering the excavations of the cable trenches.

Commented [IG8]: If drains are disrupted and refitted, there should be a specific commitment to ensure drains are able to be jetted (cleared) to the same capacity and effectiveness as prior to excavation. If joints and junctions are installed to main drains, and the linear structure is altered, this can impact on capacities to clean (jet). This is particularly significant in these silt dominated soils which require routine jetting to their full length

Commented [IG9]: Where new schemes are installed, there needs to be a commitment to remove the previous scheme. If not, there is a risk of a functioning old scheme directing water into the cable run, creating detrimental soil conditions in its vicinity due to waterlogging and saturation.

63. Post construction drainage will be required on the working easement and any temporary areas used during construction as construction will sever any existing land drainage, several post construction design techniques will be considered dependant on individual landowner requirements. Reinstated, and newly installed drains MUST be accessible from a ditch outfall to their full length to ensure routing jetting can be accomplished to this full extent. Where drains are cut and need replacing (for example, due to the cable position not allowing the pipes to be re-connected in perfect ~~alsignment~~alignment and thereby, allowing jetting access), existing drain pipe runs upstream of the cable run must be removed in order that rapid water flow/movement along these pipes to the vicinity of the cable is avoided. Field areas found to be wetter than those in close proximity to the cable are to be eliminated where they have been reported. This can include the removal of redundant drainage systems when this is the case.
64. All designs will be discussed with the Landowners and will be in line with MAFF /ADAS (1982) before installation.
65. Once the post construction land drainage has been installed subsoiling (ripping) will be undertaken to an indicative depth of 350mm from subsoil level, this will alleviate compaction caused by construction and aid soil structure recovery, subsoiling will only be undertaken in dry conditions. Once the topsoil has been reinstated the topsoil will also be ripped to mitigate any compaction from the reinstatement process.

5.7 Soil Stripping

66. Any soil stripping will follow guidance set out in Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009a). The depth of the topsoil strip is to be determined on a location-by-location basis using the pre-construction soil survey data as described in Section 2.4 and communicated via the SMP.
67. Once the working width has been cleared of vegetation, existing measured topsoil will be stripped (with the exception of an area to be used for topsoil storage). Stripping will be carried out when the soil is reasonably dry and friable.
68. Appropriate machinery and methods will be used to minimise soil compaction where the soil conditions indicate that compaction is possible. Topsoil stripping will generally be undertaken by an excavator positioned on the surface of the topsoil, excavating to the maximum topsoil depth without disturbing or removing the subsoil. Alternatively, a dozer can be used to strip the topsoil by pushing the topsoil into a bund or to an excavator.
69. Following the topsoil strip, subsoil will be excavated to the required depth from the trenches.

5.8 Soil Storage

70. The stripped topsoil and excavated subsoil will be stored within the working width. This will include topsoil being segregated into specific stockpiles where multiple topsoil horizons exist see point 16) The ground where the soil stores will be located will be free from vegetation and waste, and positioned away from tree crowns, root protection zones, watercourses and ditches. To ensure soil stores are located away from run-off, cut off ditches and swales will be used to divert water to a suitable drainage system. All designated soil storage areas would be a minimum of 10m from any open watercourse features, where practicable.
71. Any soil stores along the onshore ECC would be kept to minimum possible size with gaps to allow surface water runoff to pass through.
72. To avoid blocking overland flow of surface water during heavy rainstorms large soil stores will be appropriately sited, and there will be a provision of gaps between soil stores to allow passage of surface water. This will be detailed further in the surface water drainage strategy for each phase of work along the ECC.
73. Stockpiling and other works in areas that are shown to have higher flood hazard class ratings (as identified within Section 24.5 of the Onshore ECC and 400kV FRA (document 6.3.24.2, version 3) will be minimised or avoided where possible, in order to mitigate against any increased risk and allow flood flow through and within flood cells.
74. All stockpiling will be located on the landward side of any flood defences.
75. Topsoil and subsoil of different types and from different fields will be stored separately, as will soil from hedgerow banks or woodland strips, to reduce the potential for crop contamination during reinstatement. Sufficient space will be left between stores of different soil types to ensure segregation. Where multiple topsoil horizons are found, these are to be kept separate, and restored to the original status prior to construction. Such restoration should also replicate horizons present in unaffected ground adjacent to these areas.
76. Topsoil can be stored on either topsoil (of the same type, or from the same horizon) or on subsoil. Subsoil can only be stored on subsoil, therefore, the topsoil will be stripped from any subsoil storage areas prior to subsoil stripping or placement.
77. Stripped topsoil will be stored to the side/s of the working width in a manner that provides sufficient separation from subsoil and vehicles. Soil will be stored in an area of the site where it can be left undisturbed and will not interfere with site operations. Ground to be used for storing the topsoil will be cleared of vegetation. Topsoil will first be stripped from any land to be used for storing subsoil.
78. Topsoil will be stored in bunds will typically be 2 m in height and no more than 3 m in height. Subsoil will be stored in bunds no more than 3 m to 5 m in height (dependent on whether there is space to have a bund either side of the ECC during construction, or whether a single taller bund will be used for storage in narrower working areas) in order to minimise compaction and the impact of storage on biological processes.

Commented [IG10]: Will there be further soil horizons stockpiled? During ISH2 the Applicant made reference to accommodating a stockpile for a third soil layer, referenced as a 'transitional' horizon. We assume this represents stockpile accommodation for any subsequent soil horizons identified? We would like to see reference to this in the SMP

79. Stockpiles will be labelled with appropriate signage, a unique identifier and recorded on a plan to avoid confusion and risk of contamination.

5.9 Stockpile Maintenance

80. Effective programming will ensure soil is stored for the minimum time possible. Where soil is to be stored for over 6 months it will be covered or sown over the top and sides with an agreed seed mix to protect the soil against erosion, minimise soil nutrient loss, and maintain soil biological activity.
81. Appropriate seeding will also help prevent colonisation of the stockpile by weeds, including noxious / injurious weeds, which could spread seed onto adjacent land.
82. Where agreed with the landowner, the seed mix may be a legume-rich mix to fix nitrogen into the soil to help support growth of other grasses.
83. In the period when grass cover is establishing on the stockpiles, and where required during dry weather, the stockpiles will be watered to prevent wind erosion (generation of dust) and to ensure that the seeds establish.
84. The stockpile vegetation cover is to be managed (by spraying, mowing or stripping as appropriate and as defined in location-specific construction method statement, or similar), to prevent the spread of seeds from the stockpile onto adjacent land.
85. The condition of the stockpiles will be regularly monitored. If rainwater gathers on the stockpile surface or in areas directly adjacent to them, drainage pathways to soakaway areas away from the stockpile should be provided.

5.10 Reinstatement

86. The main objectives for the reinstatement of the land will be to restore it to its pre-development quality as far as is reasonably practicable, as determined by the information obtained during the pre-construction soils survey and agreed with the landowner. This will primarily be achieved by ensuring that the full soil profile is reinstated in the correct sequence of horizons, and in a state where good soil profile drainage and plant root development are achieved; and by ensuring that the reinstatement works cause minimum damage to soil structure.
87. Where reinstatement, for whatever reason, is not capable of replicating pre-construction soil conditions, the landowner or farmer involved shall be entitled to compensation for loss of marketable yield in the restored areas, with no limit on timescale. Such yield loss shall be determined by a simple comparison to adjacent areas in the field unaffected by construction activities. Potential issues influencing such yield outcomes include:
    - Stone contamination
    - Topsoil and subsoil horizons not being closely replicated
    - ~~86.~~ Adversely affected drainage

Commented [IG11]: We note that a stone contamination section is due to be included in an upcoming revision of the OMP. This should address the following points of concern: Given the completely stone-free nature of the soils present, it would be far better that stone contamination is prevented from the outset. Such (prevention as opposed to cure) techniques include the use of trackways as opposed to ballast, alongside assuming best practice is employed throughout. Post construction stone removal implies a high risk of soil structure damage, due to the nature of stone removal techniques employed in the industry. Clearly, the SMP must include a commitment to ensure land remains stoneless post construction, or to reflect the aforementioned compensation policy if not.

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~~87.~~88. Therefore, soil reinstatement methods will be designed to achieve soil profiles as close to the original (pre-construction) as possible and land will be reinstated as soon as reasonably practical after completion of the construction works.

~~88.~~89. The concept of 'partial restoration' during the construction of the Onshore ECC may be considered where practicable. 'Partial restoration' will involve reinstatement of the land above the cables upon completion of the trenching works, where possible, this land would be returned to agricultural use. The haul road and land required for soil storage or access would be retained for use until the completion of the construction works.

~~89.~~90. Soil reinstatement will be subject to the same constraints of weather (stop conditions) as soil stripping (see Section 5.6).

~~90.~~91. It is likely that the subsoil will have been heavily compacted during the construction period. Subsoil decompaction and preparation will be necessary prior to topsoil reinstatement to improve permeability.

Commented [IG12]: What methods will be used for this operation?

~~91.~~92. Soil reinstatement is the reverse of soil stripping with topsoil being replaced over subsoil. The specifications for reinstated soil profiles are to be determined on a location-by-location basis using the soil survey data and set out in location-specific construction method statements. Care must be taken to ensure that soil horizons (including multiple topsoil horizons) are replaced to the correct thickness (with an allowance of up to 20% bulking to allow for settlement).

~~92.~~93. Generally, any surplus subsoil material from trench excavation will be spread across the working width prior to topsoil reinstatement on a field-by-field basis provided this will not impede achievement of restoration objectives and provided the materials are compatible, in consultation with the relevant landowner.

~~93.~~94. Given the volume of soil being stripped within the OnSS footprint, there may be a requirement to remove soil off-site. Where possible, stripped topsoil will be re-used in landscaping and excavated material will be used in landscaping screening bunds (if required).

~~94.~~95. Offsite disposal of surplus soil material shall only be considered where use on-site is not feasible. The landowner/occupier will be consulted before any off-site disposal is planned. In such instances disposal will be undertaken in accordance with the Waste (England and Wales) Regulations 2011 and the Site Waste Management Plan which will be submitted for approval as part of the CoCP post consent.

~~95.~~96. Where land is returned to agricultural use, the quality of the soil reinstatement will need to be verified by the SCoW as described below.

~~96.~~97. Aftercare will commence after soil characteristics required to achieve the reinstatement standard have been achieved. For the land in agricultural use before construction this means that the soil is brought as close as reasonably practicable to the physical state it was before construction.

~~97.~~98. Soil survey and soil testing will be carried out to record the physical characteristics of the reinstated soils. This will allow the post-construction/reinstatement condition of the soils and land to be judged against/compared with their pre-construction condition, as determined

Commented [IG13]: What methods will be used to assess this? If using British Standard as mentioned in paragraph 16, note there is no methodology of physical soil assessment included in these standards. How will soil physical condition be assessed post installation?

through the detailed pre-construction soil surveys. The SCoW will then compare the characteristics of the reinstated soils to the ‘before’ statement to verify that the land has been reinstated to the required standard. If the reinstated soil properties are found to differ from the ‘before’ characteristics to an extent that makes it impossible for the standard to be reached, remediation will need to be carried out. This approach will ensure that any problems are identified and rectified early after construction and before the aftercare period commences.

5.11 Aftercare

~~98.~~99. Depending on the land-use, agricultural activities, site-specific conditions, and site-specific construction activities, the aftercare may include treatments such as: cultivation (e.g. subsoiling), installation of land drainage schemes, seeding, liming, and/or fertilising, as and when required.

~~99.~~100. The aftercare programme is to be agreed between the Contractor, landowner, and (if applicable) tenant farmer. It will clearly define who is responsible for which part of the programme.

~~100.~~101. A flexible period of aftercare of minimum one-year duration is suggested (Defra, 2009a guidance suggests aftercare between 1- and 5-years post construction), with the aftercare deemed complete when the reinstatement standard has been achieved. The period of aftercare will be determined during the preparation of the SMP. It will be responsibility of the SCoW (or similar appointed person) to determine when the reinstatement standard has been met.

5.12 Monitoring

~~101.~~102. Audits of the soil management at the construction sites will be undertaken on a periodic basis and records will be maintained. The programme for monitoring and review will be devised and included in the SMP. An indicative monitoring schedule is included in Table 2.

~~102.~~103. The SMP will be reviewed periodically as required, and any required updates communicated to the relevant stakeholders.

Table 22~~2~~: Indicative Monitoring Schedule

	What to Look For	Responsibility	Frequency
Soil Stockpiles	Erosion rills, water ponding, loss of protective vegetation, invasive weeds	Contractor	TBC
Soil Handling	Conformance with the SMP, record operations undertaken, weather and soil conditions, any problems and corrective actions undertaken	Contractor	TBC
	Conformance with the SMP, check daily record	ALO/SCoW	TBC
Verification of the reinstatement standard	Has the soil profile been reinstated, as much as practicable to do so, to a condition when last used for agriculture	SCoW	TBC
Aftercare reports	Significant differences in crop performance, compaction and waterlogging between the reinstated and undisturbed land	TBC	TBC

~~103.~~104. Annual reports will be prepared during the aftercare period. A minimum of one report will be prepared as the proposed minimum aftercare period is one year.

~~104.~~105. The aftercare report will contain results of appropriate soil testing, the SCoW or ALO will determine what tests are required and carry out the testing and record the soil condition. Refer to section 16 for details of the parameters to be measured.

~~105.~~106. As a minimum the testing will comprise:

- visual assessment of plant cover and ground surface; and
- hand excavation of soil profile pits to assess the soil structure at depth and penetration by plant roots. These may be predominantly focussed on areas where the visual assessment indicates that there may be an issue with the quality of the reinstatement. Therefore, the density of soil profile pits will vary.
- Basic soil chemical (nutrient status), biological (including biological activity and soil organic matter status), and physical (soil structure and texture, including stone content) status within at least the topsoil horizon(s).

~~106.~~107. Non-conformance reporting, corrective actions, and incident responses are to be undertaken by the ALO according to the procedures described in the CoCP.

6 References

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