



Dogger Bank C/Sofia Onshore Works Application

Appendix 3 -

Land Quality Assessment



Land Quality Assessment

Doc. No. PM763-ARCUS-00001;
003655558-01
Rev. no. 01
Valid from: July 2020

DOGGER BANK
WIND FARMS



LEFT INTENTIONALLY BLANK



Land Quality Assessment

Doc. No. PM763-ARCUS-00001;
003655558-01
Rev. no. 01
Valid from: July 2020

DOGGER BANK
WIND FARMS

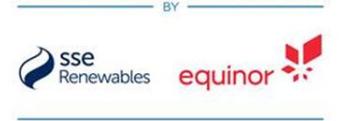


Table of Contents

1	Introduction	4
2	Methodology	5
3	Baseline for Assessment	10
4	Assessment of Potential Effects	12
5	Mitigation and Enhancement	15
6	Cumulative Effects	15
7	Summary and Statement of Change/No Change	16

1 Introduction

1.1 Purpose of this Report

This Land Quality Assessment accompanies the Environmental Appraisal which is submitted to support the planning application (the Application) made by Doggerbank Offshore Wind Farm Project 3 Projco Limited (the Projco) and Sofia Offshore Wind Farm Limited (SOWFL) (the Applicants), for consent pursuant to Section 62 of the Town and Country Planning Act 1990 as amended¹.

A Development Consent Order (2015 DCO) was granted for Dogger Bank Wind Farm C (previously known as Dogger Bank Teesside A Offshore Wind Farm) and Sofia Offshore Wind Farm (previously known as Dogger Bank Teesside B Offshore Wind Farm) (the Applicants' Projects), including the onshore transmission works required to export electricity to the grid in August 2015.

The Application includes five areas of alternative and additional infrastructure to the consented 9 kilometres (km) buried onshore grid connection, spanning from the landfall for Dogger Bank Wind Farm C (DB-C) and Sofia Offshore Wind Farm (Sofia) to the National Grid at Lackenby Substation (the Works).

This Report provides a focused appraisal of land quality, with consideration of effects on geology, minerals and waste from the Works, including comparison against the consented effects deemed as acceptable by the 2015 DCO. This assessment demonstrates that the Works not give rise to additional likely significant effects than those identified within the 2014 DCO Environmental Statement (2014 ES)

It should be noted that while the 2014 ES² included a joint Geology Land Quality and Water chapter, for this Application Hydrology, Hydrogeology, Flood Risk and Water Framework Directive is assessed in a separate standalone report. The Hydrology Assessment is included within Appendix 2 of the Environmental Appraisal.

1.2 Development Context

For the ease of reference, the Works, as shown in Figure 1.2 (a – c) of the Environmental Appraisal, is split into areas as below:

- Area 1 – A174 Crossing;
- Area 2 – South of Kirkleatham Memorial Park;
- Area 3 - Wilton East;
- Area 4 - Main Welfare Hub south of Wilton; and
- Area 5 - HVAC Cable Corridor.

¹ UK Government (1990) Town and Country Planning Act 1990 [Online] Available at: <http://www.legislation.gov.uk/ukpga/1990/8/contents> (Accessed on 11/05/2020)

² Forewind (2015) Dogger Bank Teesside A & B ES

1.3 Document Structure

This Report is structured as follows:

- Introduction;
- Methodology;
- Baseline for Assessment;
- Assessment of Potential Effects;
- Mitigation and Enhancement;
- Cumulative Effects; and
- Summary and Statement of Change/No Change.

This Report should be read in conjunction with Chapter 24 of the 2014 ES which provides the assessment of Geology, Water Resources and Land Quality for the 2015 DCO.

2 Methodology

2.1 Introduction

This section sets out a summary of the guidance relevant to this assessment, and defines the scope of the baseline studies and assessment methods.

2.2 Effects Scoped Out

2.2.1 *Effects on Geology*

2.2.1.1 *Designations*

There were two geological designations identified within the 2015 DCO Limits: one Regionally Important Geological Sites (RIGS) known as Red Howles and one geological Site of Special Scientific Interest (SSSI), known as Redcar Rocks, located 150 m and 2 km to the north of the 2015 DCO Limits, respectively.

The Red Howles RIGS and Redcar Rocks SSSI are located 150 m and 2 km to the north of the Works respectively. As these lie outside of the direct impact footprint of the Works and are no closer than the 2015 DCO, they are not considered to be at risk from the Works and therefore scoped out of any further consideration.

2.2.1.2 *On Site Geology*

The published superficial geology for the entire extent of the Works is Till, Devensian - Diamicton. The superficial soils presented in the 2014 ES are unchanged for the Works. The entire extent of the Works is

underlain by the Redcar Mudstone Formation. The solid geology presented in the 2014 ES are unchanged for the Works.

The 2014 ES concluded that effects on geology were negligible. As there is no change to existing conditions and the extent of the Works is substantially less when compared to the 2015 DCO Limits, direct effects on geology is scoped out of any further consideration.

2.2.2 Effects on Minerals

Consideration has been given to the impacts the Works could have on minerals in line with MPS1 and Planning and Minerals Practice Guide, particularly in relation to avoiding unnecessary sterilisation of non-mineral development. However, the Works being considered in this assessment are underlain by glacial till of significant thickness, therefore the effect of the Works on mineral would be negligible and is scoped out of this assessment.

2.2.3 Effects on Waste

No waste is anticipated to be generated as a result of the Works, unless contaminated land is encountered. The area within the Works consist of a mixture of derelict brownfield and arable land. Potential areas of contaminated land have been identified within Area 3 and Area 4 at Wilton East and the Main Welfare Hub south of Wilton respectively, and are considered as part of the land quality assessment. However, as these are not operational landfills, they are not considered to be current sources of waste. The Works will be subject to a Site Waste Management Plan (SWMP) secured by planning condition that is consistent with the proposals consented in the 2015 DCO.

As the land quality assessment considers contaminated land and this is the only potential source of waste for the Works, any other form of waste is scoped out of this assessment.

2.2.4 Operational Effects

No waste will be generated through the operation of the Works, and there will be no effect on geology or land quality during operation.

As a result, operational effects are scoped out of further consideration.

2.2.5 Decommissioning Effects

Decommissioning effects on geology and land quality have been scoped out as such works would be carried out in line with the decommissioning plan secured by the 2015 DCO Requirements, and all effects are considered to be equal to or lesser than construction effects assessed in this report.

With regards to waste, no waste is expected to be generated during decommissioning, with the onsite cabling made safe (capped) and left in-situ.

As a result, decommissioning effects are scoped out of further consideration.

2.3 Policy and Guidance

This assessment has been undertaken with due consideration of the following legislation and guidance (and amendments, where appropriate):

- Environmental Protection Act 1990;
- Environment Act 1995;
- Revised Waste Framework Directive (2008/98/EC);
- Waste (England and Wales) Regulations 2011 SI No 988;
- Hazardous Wastes (England and Wales) Regulations 2005 SI No 894 (as amended);
- Site Waste Management Plan Regulations 2008 SI No. 314;
- Contaminated Land (England) Regulations 2006 Statutory Instrument No.1380;
- Construction (Design and Management) Regulations 2015;
- Environment Agency Model Procedures for the Management of Land Contamination (Contaminated Land Report (CLR) 11) (2004);
- Environment Agency Hazardous Waste: Interpretation of the definition and classification of hazardous waste (3rd edition) (May 2013);
- Department for Environment, Food and Rural Affairs (Defra) - Guidance on applying the Waste Hierarchy (June 2011);
- Contaminated Land: Application in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice (March 2011);
- Department for Environment, Food and Rural Affairs (Defra): Non-statutory guidance for site waste management plans (April 2008);
- BS 5930:2015+A1:2020, Code of practice for ground investigations (July 2015);
- BS10175:2011, BS 10175:2011+A2:2017(March 2011); and
- CIRIA C552 - Contaminated Land Risk Assessment (January 2001).

2.4 Scope of Assessment

2.4.1 Realistic Worst Case

This assessment considers the concurrent construction of the Applicants' Projects as the realistic worst-case construction scenario as this will result in greatest effect on land quality practices. All other scenarios are scoped out of further assessment.

2.4.2 Study Area

A 1 km Study Area extending around the location of the Works is utilised for the purpose of this assessment. A 1 km Study Area was implemented within 2014 ES for the Geology and Land Quality Assessment. As illustrated in Section 2.2, guidance and policy for land quality has not changed, and the 1 km Study Area remains appropriate for the Works.

2.4.3 Assessment

The Works has the potential to result in a direct effect upon land quality. Where required for the Works, a Conceptual Site Model (CSM) has been developed to characterise the existing environment and to enable an assessment of the sensitivity of land quality receptors likely to be affected by the Works.

2.5 Assessment Methodology

The methodology for this assessment is bespoke and specific to land quality and contaminated land guidance. This allows for a direct comparison with the CSM methodology included within the 2014 ES.

The risk evaluation methodology is a qualitative assessment and is based on CIRIA C552 - Contaminated Land Risk Assessment. The process involves the classification of the following:

- Magnitude of the potential consequence which takes into account both the potential severity of the hazard and the sensitivity of the receptor; and
- The magnitude of the probability (likelihood) which takes into account both the presence of the hazard and the receptor and the integrity of the pathway.

The resultant risk categories are shown in Table 2.1 and Table 2.2.

Table 2.1: Risk Classification Matrix

Probability	High Likelihood	Very High	High	Moderate	Moderate/Low
	Likely	High	Moderate	Moderate/Low	Low
	Low Likelihood	Moderate	Moderate/Low	Low	Very Low
	Unlikely	Moderate/Low	Low	Very Low	Very Low
		Severe	Medium	Mild	Minor
Consequence					

Table 2.2: Risk Classification Definition

Risk Classification	Definition
Very High	Avoid development at these locations.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the longer term.

Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from an identified hazard but it is likely that this harm, if realised, would at worst normally be mild.
Very Low	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

2.5.1 *Potential Sources*

Contamination sources can include neighbouring land uses and historical activities (on/off site). Considering previous and current information, the following identified sources are noted for this assessment: road side embankments; disturbed/contaminated ground/made ground soils; and industrial works.

2.5.2 *Potential Pathways*

Direct contact – Ingestion and physical contact with contaminants which are present at or near the surface. This pathway is viable during the construction phase (cable trenching etc.). The material used for backfilling around the cable will need to be proven suitable for use as per the CL:AIRE - Development Industry Code of Practice. Any risks of exposure to construction workers should be mitigated through Personal Protective Equipment (PPE).

Inhalation – From airborne particles, ground gasses and vapours that may be present. In areas where the cable trenching is to occur, backfilling will be with clean material. Any risks of exposure to construction workers will be mitigated through PPE.

2.5.3 *Potential Receptors*

Human health (construction workers) – Construction workers are considered to be a sensitive receptor due to the close proximity in which they are required to work with the soils. However, this assessment is for long term health risks and further assessment is required by the contractor.

Human health (future site users / land owners) – Future site users / land owners will only have access to the area within the Works following construction. Assuming soils are treated appropriately during construction, the risk to human health is not considered to be significant.

2.5.4 Assessment of Effect

Using professional judgement and interpretation of the preliminary CSM, a qualitative assessment of the level of potential effect of the Works on land quality resources will be determined. The assessment will allow a comparison with Appendix 24A of the 2014 ES.

3 Baseline for Assessment

3.1 Summary of 2014 Baseline – Land Quality

A land quality assessment including a preliminary risk assessment for contaminated land was undertaken as part of the 2014 ES. The 2014 ES screened current industrial land uses, and historical potential sources of contamination in a process which covered a number of criteria as detailed in Chapter 24 of the 2014 ES. Following the screening process, the remaining industrial and commercial land uses were considered further in the CSM.

3.2 2020 Baseline – Land Quality

Land quality and contaminated land risk requires a screening process to understand the potential for contamination risk. Using the available information from the 2014 ES and historical mapping screening of current industrial land uses, identification of historical potential sources of contamination was undertaken in relation to the Works. Table 3.1 sets out the land uses within the Works.

Table 3.1: Land Uses and Potential Contamination Source within the Works

Area of Works	Land Use and Potential Contamination Source	Potential Contaminants Associated with Land Use or immediately adjacent Land Use
Area 1 – A174 Crossing	East of Grewgrass Farm, arable farmlands	pH, Sulphates, range of Pesticides, and Herbicides
Area 2 – South of Kirkleatham Memorial Park	Arable farm lands, east of the B1269 road	pH, Sulphates, range of Pesticides, and Herbicides
Area 3 - Wilton East	Arable farm lands, east and west of the A174; before entering the roadside verge an area of disturbed ground is present, sparsely planted, within the ground of Wilton International	Heavy Metals associated with coal ash, acids, alkalis, aromatic hydrocarbons, and PCBs
Area 4 – Main Welfare Hub south of Wilton	Arable farm lands and localised woodland, plot north of the industrial estate road immediately adjacent to large industrial works (Ensus UK).	Heavy Metals associated with coal ash, acids, alkalis, aromatic hydrocarbons, and PCBs
Area 5 - HVAC Cable Corridor	Arable farm lands and localised woodland crossing Greystone Road.	pH, Sulphates, range of Pesticides, and Herbicides



Land Quality Assessment

Doc. No. PM763-ARCUS-00001;
003655558-01
Rev. no. 01
Valid from: July 2020

DOGGER BANK
WIND FARMS

BY



4 Assessment of Potential Effects

4.1 Summary of 2014 Potential Effects – Land Quality

A Land Quality Phase 1 Desk Study was completed as part of the 2014 ES. A CSM was used to assess the potential for source-pathway-receptor linkages (contaminant linkages) which could be present, and may be affected by the works in the 2015 DCO.

The full risk evaluation of all identified sources of contamination and viable contaminant linkages is presented in the Land Quality Phase 1 Desk Study included in the 2014 ES. This includes a summary of the viable contaminant linkages with risk classification greater than low also presented.

The 2014 ES concluded that effects on land quality as a result of the works in the 2015 DCO Limits were negligible.

4.2 Effects as a Result of the Works – Land Quality (CSM Results)

It is considered that the sources classified as very low risk require no further work on contaminated land.

All of the sources classified as low risk will be investigated further if located within the final alignment/design of the Works. It is recommended that this is done by contacting the site operators to understand if there has been any record of breakdown or contamination event. It is likely that if these facilities have been well maintained and pollution events have been recorded, that these sources will not require any further consideration.

All of the sources with risk ratings of 'Moderate/Low' and 'Moderate' will require further investigation if located within the final alignment/design of the Works. Considering the industrial nature and likely licenced activities undertaken at these sites, it is likely that there are records detailing the more specific land uses. Records may also exist for previous ground investigation and risk assessment that may help in understanding the risks from these land uses. If such information is not available, further site investigation may be required.

Any excavated material should be handled, managed and disposed of in accordance with current waste management guidance and legislation and detailed in a SWMP or Materials Management Plan.

Although there is potential for contaminated sites within the Works, it is not expected that soils will be highly contaminated. The risk remains that there may be areas of unsuspected contamination. The likelihood of contact with contamination is low, and any adverse effects are likely to be temporary. Therefore, the magnitude of these impacts prior to mitigation is low, resulting in a negligible impact on this receptor.

This approach demonstrates that the Works give rise to no new or materially different environmental effects than those identified within the 2014 ES and will not give rise to any new likely significant effects. There are no additional construction effects on land quality as a result of the Works situated. It is considered that the sources classified as very low risk require no further work on contaminated land.

All of the sources classified as low risk will be investigated further if located within the final alignment/design of the Works. It is recommended that this is done by contacting the site operators to understand if there has been any record of breakdown or contamination event. It is likely that if these facilities have been well maintained and pollution events have been recorded, that these sources will not require any further consideration.

All of the sources with risk ratings of 'Moderate/Low' and 'Moderate' will require further investigation if located within the final alignment/design of the Works. Considering the industrial nature and likely licensed activities undertaken at these sites, it is likely that there are records detailing the more specific land uses. Records may also exist for previous ground investigation and risk assessment that may help in understanding the risks from these land uses. If such information is not available, further site investigation may be required.

Any excavated material should be handled, managed and disposed of in accordance with current waste management guidance and legislation and detailed in a SWMP or Materials Management Plan.

Although there is potential for contaminated sites within the Works, it is not expected that soils will be highly contaminated. The risk remains that there may be areas of unsuspected contamination. The likelihood of contact with contamination is low, and any adverse effects are likely to be temporary. Therefore, the magnitude of these impacts prior to mitigation is low, resulting in a negligible impact on this receptor.

This approach demonstrates that the Works give rise to no new or materially different environmental effects than those identified within the 2014 ES and will not give rise to any new likely significant effects. There are no additional construction effects on land quality as a result of the Works situated.

Table 4.1: Works Preliminary CSM

Area of Works	Land Use	Pathway	Receptor	Consequence of Risk Being Realised (Severity)	Probability of Risk Being Realised (Likelihood)	Risk Classification	Risk Management	Residual Risk
Area 1 – A174 Crossing	East of Grewgrass Farm, arable farmlands.	Dermal Exposure Inhalation	Construction Workers	Medium	Unlikely	Very Low	Appropriate PPE and Risk Assessments. Where possible HDD or other trenchless installation methods should be used to avoid contaminated areas.	Very Low
Area 2 – South of Kirkleatham Memorial Park	Arable farm lands, east of the B1269 road.	Dermal Exposure Inhalation	Construction Workers	Medium	Unlikely	Very Low	Appropriate PPE and Risk Assessments. Where possible HDD or other trenchless installation methods should be used to avoid contaminated areas.	Very Low
Area 3 - Wilton East	Arable farm lands, east and west of the A174; before entering the roadside verge an area of disturbed ground is present, sparsely planted, within the ground of Wilton International.	Dermal Exposure Inhalation	Construction Workers	Medium	Low	Moderate/Low	Appropriate PPE and Risk Assessments. Where possible HDD or other trenchless installation methods should be used to avoid contaminated areas. Further investigation if located within the final alignment of the cable route.	Moderate/Low
		Gas Emissions	Construction Workers/Operational Workers	Severe	Unlikely	Moderate/Low	Appropriate PPE and Risk Assessments including gas detection measures. Where possible HDD or other trenchless installation methods should be used to avoid contaminated areas. Further investigation if located within the final alignment of the cable route.	Moderate/Low
Area 4 - Main Welfare Hub south of Wilton	Arable farm lands and localised woodland, plot north of the industrial estate road immediately adjacent to large industrial works (Ensus UK).	Dermal Exposure Inhalation	Construction Workers	Medium	Likely	Moderate/Low	Appropriate PPE and Risk Assessments. Where possible HDD or other trenchless installation methods should be used to avoid contaminated areas. Further investigation if located within the final alignment of the cable route.	Moderate/Low
Area 5 - HVAC Cable Corridor	Arable farm lands and localised woodland crossing Greystone Road.	Dermal Exposure Inhalation	Construction Workers	Medium	Unlikely	Very Low	Appropriate PPE and Risk Assessments. Where possible HDD or other trenchless installation methods should be used to avoid contaminated areas.	Very Low

5 Mitigation and Enhancement

5.1 Summary of 2014 ES Mitigation

In order to mitigate the potential effects associated with the excavation of potentially contaminative soil or waste inhalation of gas risks will be considered and mitigated for all construction workers including sub-contractors and will be managed through the Construction Phase Health and Safety Plan and CEMP generally adopting the following measures:

- Construction workers including sub-contractors will follow good site practices and hygiene rules as set out in BS5930 and BS10175:2011;
- Appropriate PPE will be worn by construction workers including sub-contractors and health and safety measures undertaken to mitigate any short-term risk during construction;
- Gas risks will be considered for all construction workers including sub-contractors whenever there is a requirement to enter confined spaces as part of the construction works, this will be managed through the Construction Phase Health and Safety Plan and CEMP; and
- All construction works should be undertaken following best practice and in-line with the CDM Regulations.

The mitigation measures proposed in the 2014 ES in relation to Site Waste Management relevant to contamination include:

- Any hazardous wastes will be stockpiled or stored separately from any non-hazardous stockpiles;
- Stockpiles of soil will be covered or stored in bunded areas or up-gradient from drains and control waters or stored in impermeable containers (e.g. Skips), to prevent pollution from run-off;
- The CL:AIRE CoP will be followed to demonstrate that excavated material is not waste at the point of reuse. Where the CoP cannot be followed, the use of waste material will be covered by an environmental permit, or appropriate exemption from environmental permitting (e.g. re-use of waste hardcore for temporary roads);

5.2 Additional Mitigation and Enhancements

As a result of the Works, there is no need for additional mitigation and enhancement measures to those set out in Section 5.1 and these will be secured by planning condition.

6 Cumulative Effects

The 2014 ES concluded that there were no significance effects arising from the cumulative effect of other developments on geology and land quality resources.

No additional cumulative effects have been identified. Geology within the Works that may be affected are isolated from other schemes, such that the effect on them cannot be cumulative. There are no additional cumulative effects arising from the Works on geology within the study area, as the effects from construction or operation remain the same for the Works as for the 2014 ES.

7 Summary and Statement of Change/No Change

The summary and Statement of Change/No Change is detailed in Table 7.1 below. This assessment demonstrates that the Works not give rise to additional likely significant effects than those identified within the 2014 ES.

Table 7.1: Summary and Statement of Change/No Change

Receptor	2014 ES	Effects as a Result of the Works	Change/No Change to 2014 ES Conclusion
Land Quality	Negligible	Negligible	No Change