



Pennant Walters

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# **GLANLLYNFI GARTH WIND FARM**

## **Draft Environmental Statement**

### **Chapter 11 - Ground Conditions**



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# 11 Ground Conditions

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## 11.1 Introduction

- 11.1.1. This chapter presents the assessment of the likely significant effects of the Proposed Development with respect to Ground Conditions, including geology (geodiversity), minerals, soil receptors (including peat), and land contamination. The assessment is based on information obtained to date. It should be read in conjunction with the project description provided in **Chapter 4: Development Description** and with respect to relevant parts of the following chapters:
- **Chapter 8: Biodiversity** - a large proportion of the biodiversity in terrestrial ecosystems is present in soil, and pollutants associated with land contamination have the potential to impact on biodiversity, this chapter should therefore be read in conjunction with Chapter 8 which considers the potential for significant effects on biodiversity.
  - **Chapter 10: Water Environment** - the water environment chapter considers the likely significant effects of the Proposed Development on water resources including consideration of flood risk, there are common receptors between water environment and land contamination receptors, and there is interaction between the water environment and soil resources e.g., in relation to land drainage, soil compaction, and erosion/runoff.
- 11.1.2. The chapter is also supported by the following technical appendices:
- **Appendix 11A: Geoenvironmental Preliminary Risk Assessments (PRAs) for the Northern and Southern Array;** and
  - **Appendix 11B: Phase 1 Soil and Peat Survey Report.**
- 11.1.3. This chapter describes:
- the legislation, policy and technical guidance that has informed the assessment (**Section 11.2**);
  - consultation and engagement that has been undertaken and how comments from consultees relating to Ground Conditions have been addressed (**Section 11.3**);
  - the methods used for baseline data gathering (**Section 11.4**);
  - overall baseline (**Section 11.5**);
  - future baseline (**Section 11.6**);
  - the scope of the assessment for Ground Conditions (**Section 11.7**);
  - the methods used for the assessment (**Section 11.8**);
  - the maximum design scenario for assessment (**Section 11.9**);
  - embedded measures relevant to Ground Conditions (**Section 11.10**);
  - the assessment of Ground Conditions effects (**Section 11.11, 11.12 and 11.13**);
  - assessment of cumulative effects (**Section 11.14**);

- a summary of the significance conclusions (**Section 11.15**); and
- an outline of further work to be undertaken for the Environmental Statement (ES) (**Section 11.16**).

## Limitations and assumptions

- 11.1.4. The Draft ES has been produced to fulfil Pennant Walters's consultation duties and enable consultees to develop an informed view of the likely significant effects of the Proposed Development.
- 11.1.5. Geoenvironmental Preliminary Risk Assessments (PRAs) have been completed for the Northern Array and the Southern Array (see **Appendix 11A**). Ground disturbance required to construct the Grid Connection will be entirely within the Grid Connection footprint and this feature of the Proposed Development is therefore covered by the Northern Array PRA. At the time of producing the Draft ES, the PRAs are still awaiting site walkover survey information. The walkovers will be completed prior to the Final ES and the PRAs updated as required. A request for relevant environmental information and Petroleum Officer information has been made to BCBC. This is awaited at the time of writing.
- 11.1.6. An assessment of effects associated with the Forestry Access Track has not been undertaken as part of the Draft ES as the design is yet to be determined. The Final ES will be updated to consider any effects associated with the Forestry Access Track.

## 11.2 Relevant legislation, planning policy and technical guidance

- 11.2.1. This section identifies the legislation, planning policy and technical guidance that has informed the assessment of effects with respect to Ground Conditions. Further information on policies relevant to the Proposed Development is provided in **Chapter 5: Legislation and policy overview**.

### Legislation

- 11.2.2. A summary of the relevant legislation is given in **Table 11.1**.

**Table 11.1 Legislation relevant to the Ground Conditions assessment.**

| Legislation                                                                                             | Context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Environment (Wales) Act 2016 <sup>1</sup>                                                           | The Act makes provisions within Wales for the planning and managing of natural resources at national and local level. Natural resources are defined in Part 1, 2, as including several resources of relevance to the Ground Conditions assessment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Well-being of Future Generations (Wales) Act (2015) <sup>2</sup>                                        | The Act does not refer explicitly to soils or land contamination; however, it requires public bodies in Wales to think about the long-term impact of their decisions. It requires them to act in accordance with sustainable development principles, with the aim of achieving well-being goals, including maintaining and enhancing a biodiverse natural environment with healthy functioning ecosystems that support social, economic, and ecological resilience and the capacity to adapt to change (for example climate change).                                                                                                                                                                                                                                                        |
| Environmental Protection Act (1990) <sup>3</sup>                                                        | <p>Part 2 of the Act makes provision for the improved control of pollution arising from certain industrial and other processes. Part 2A of the Act provides the regulatory basis for the identification, designation, and remediation of contaminated land.</p> <p>The potential for the Proposed Development to be built on land potentially affected by historical contamination requires assessment to ensure it is suitable for the proposed land-use and that, where necessary, remediation is carried out to ensure the land cannot be determined as Contaminated Land under the Act.</p> <p>Appropriate embedded environmental measures have been put in place as detailed in <b>Section 11.8</b> of this chapter to address risks associated with potential land contamination.</p> |
| Environment Act 1995 <sup>4</sup>                                                                       | Established the Environment Agency and gave it responsibility for environmental protection and flood defence. Natural Resources Wales (NRW) was formed in April 2013, largely taking over the functions of the Countryside Council for Wales, Forestry Commission Wales and the Environment Agency in Wales.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| The Environmental Damage (Prevention and Remediation) (Amendment) (Wales) Regulations 2015 <sup>5</sup> | Regulations implementing the European Union (EU) Directive on environmental liability setting out the principles for prevention and remedy of environmental damage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Health and Safety at Work etc. Act 1974 <sup>6</sup>                                                    | The Health and Safety at Work etc. Act and regulations made under the Act, notably The Management of Health and Safety at                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

<sup>1</sup> UK Government (2016). *Environment (Wales) Act 2016*. Available at: <https://www.legislation.gov.uk/anaw/2016/3/contents/enacted> [Accessed: July 2026].

<sup>2</sup> National Assembly for Wales (2015). *Well-being of Future Generations (Wales) Act 2015*. Available at: <https://www.futuregenerations.wales/wp-content/uploads/2017/01/WFGAct-English.pdf> [Accessed July 2026].

<sup>3</sup> UK Government (1990). *Environmental Protection Act 1990*. Available at: <https://www.legislation.gov.uk/ukpga/1990/61/contents> [Accessed July 2026].

<sup>4</sup> UK Government (2026). *Environment Act 1995*. Available at: <https://www.legislation.gov.uk/ukpga/1995/25/contents> [Accessed July 2026].

<sup>5</sup> National Assembly for Wales (2015). *The Environmental Damage (Prevention and Remediation) (Amendment) (Wales) Regulations 2015*. Available at: <https://www.legislation.gov.uk/wsi/2015/1394/made> [Accessed March 2026].

<sup>6</sup> UK Government (1974). *Health and Safety at Work etc. Act 1974*. Available at: <https://www.legislation.gov.uk/ukpga/1974/37/contents> [Accessed July 2026].

| Legislation                                                                  | Context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                              | <p>Work Regulations 1999<sup>7</sup>, place responsibilities upon employers to carry out a risk assessment for every work activity and to document it. Besides carrying out a risk assessment, employers also need to make arrangements for implementing the health and safety measures identified as necessary by the risk assessment; appoint competent people to help them implement the arrangements; set up emergency procedures; provide clear information and training to employees; and work together with other employers sharing the same workplace.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>The Construction (Design and Management) Regulations 2015<sup>8</sup></p> | <p>The Construction (Design and Management) Regulations 2015 (CDM) place specific duties on clients, designers, and contractors, so that health and safety is considered throughout the life of a construction project from its inception to its subsequent final demolition and removal.</p> <p>They include the requirement to appoint a Principal Designer and Principal Contractor to co-ordinate health and safety aspects during construction.</p> <p>Under the CDM regulations, designers must avoid foreseeable risks so far as reasonably practicable by eliminating hazards from the construction, cleaning, maintenance, and proposed use and demolition of a structure; reducing risks from any remaining hazard; and giving collective safety measures priority over individual measures.</p> <p>Construction of the Proposed Development will fall under the requirements of the Regulations requiring consideration of health and safety to be incorporated into the design of the Proposed Development components and at construction stage.</p>                                                                                                                                                         |
| <p>The Control of Asbestos Regulations 2012<sup>9</sup></p>                  | <p>The Control of Asbestos Regulations 2012 (CAR 2012) apply to employers who carry out work which disturbs, or is likely to disturb, asbestos. This includes groundworks where there is asbestos present or suspected to be present in the ground as loose fibres or as asbestos containing materials (ACMs).</p> <p>To comply with CAR 2012, in respect of asbestos-contaminated soil and construction and demolition materials, employers must consider people other than their own employees in the risk assessment required by Regulation 6, and in the action taken to prevent or control exposure required by Regulation 11. The other key regulation relevant to the Proposed Development is the requirement under Regulation 16 to prevent or reduce the spread of asbestos. Every employer must prevent or, where this is not reasonably practicable, reduce to the lowest level reasonably practicable, the spread of asbestos from any place where work under the employer's control is carried out.</p> <p>During construction works for the Proposed Development there is the potential for localised asbestos containing materials or soils to be encountered in the ground. Asbestos can be found on</p> |

<sup>7</sup> UK Government (1999). *The Management of Health and Safety at Work Regulations 1999*. Available at: Available at: <https://www.legislation.gov.uk/ukpga/1995/25/contents> [Accessed July 2026].

<sup>8</sup> UK Government (2015). *The Construction (Design and Management) Regulations 2015*. Available at: *The Construction (Design and Management) Regulations 2015* [Accessed July 2026].

<sup>9</sup> UK Government (2012). *The Control of Asbestos Regulations 2012*. Available at: <https://www.legislation.gov.uk/uksi/2012/632/contents/made> [Accessed July 2026].

| Legislation | Context                                                                                                                                                                                                                                                                                         |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | agricultural land or in any made ground e.g., due to historical ad hoc waste disposal to land, incorporation of demolition material into made ground or releases of fibres from Asbestos Containing Materials ('ACM') structures in poor condition, and subsequent spread by vehicle movements. |

## Planning Policy

11.2.3. A summary of the relevant national and local planning policy is given in **Table 11.2**.

**Table 11.2 Planning policy relevant to the Ground Conditions assessment**

| Planning Policy                                                 | Context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Planning Policy Wales (Edition 12, February 2024) <sup>10</sup> | <p>Planning Policy Wales, Edition 12 (PPW12) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars and policy clarification letters which together with PPW provide the national planning policy framework for Wales.</p> <p>Chapter 6 Distinctive and Natural Places in PPW12 refers to Recognising the Environmental Qualities of Places, aiming to minimise adverse effects on the environment. Figure 12 of PPW12 sets out 'The Step-Wise Approach' to maintain and enhance biodiversity. The Step-Wise Approach has 6 steps: 1) Avoid, 2) Minimise, 3) Mitigate/ Restore, 4) Compensate on site, 5) Compensate off site, and 6) Refuse planning permission.</p> <p>Proposals in statutory designated sites, are as a matter of principle stated to be unacceptable, however this principle extends to sites containing protected species and habitats which are 'irreplaceable'. Irreplaceable habitats are defined in PPW12 as: <i>"Habitats, including the natural resources which underpin them, which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity. Examples include, ancient woodland and veteran trees, ancient hedgerows, wet woodlands, sand dunes, peatland, species rich grassland, long undisturbed soils, blanket bog, salt marsh and lowland fen"</i>.</p> <p>There is currently no available Welsh Government definition of 'long undisturbed soils', so the criteria of being unique, or rare, could be applied to identify mineral soils as long undisturbed soils if they do not fall within one of the other example habitat categories.</p> <p>Land contamination is covered in Chapter 6 of PPW12. Where land is proposed for development, the onus is with the developer to ensure that the development of the site will remove any unacceptable risks and to demonstrate that the land is suitable</p> |

<sup>10</sup> Welsh Government (2024). Planning Policy Wales, Edition 12. February 2024. Available at: [Planning Policy Wales - Edition 12](#) [Accessed July 2026]

| Planning Policy                                                                                                                        | Context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                        | for its proposed use and would not meet the legal definition of contaminated land under Part 2A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Minerals technical advice note (MTAN) Wales 1: aggregates <sup>11</sup>                                                                | MTAN sets out Welsh Government policies and planning guidance on the provision of aggregates. Chapter D sets out detailed advice on the mechanisms for delivering high standards of restoration, aftercare and provides for a beneficial after-use. No onsite borrow pits are proposed for the Proposed Development.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Welsh Government (2021) Future Wales: the national plan 2040: Our National Development Framework <sup>12</sup>                         | Policy 9 – Resilient Ecological Networks and Green Infrastructure advocates the sustainable management of natural resources including minerals, soils and geodiversity resources, and measures which reduce pollution.<br><br>The embedded measures in <b>Table 11.20</b> includes measures to avoid or minimise effects on minerals, soils and geodiversity resources, and to avoid construction activities resulting in land contamination.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Bridgend Replacement Local Development Plan 2018–2033 <sup>13</sup><br><br>(Northern and Southern Arrays are in this council boundary) | Policy DNP9: Natural Resource Protection and Public Health: includes that developments subject to possible land contamination or land instability demonstrate suitable mitigation measures to reduce the risk of harm to human health and other receptors.<br><br>Policy SP3: Good Design and Sustainable Placemaking: includes that developments should avoid or minimise noise, air, and soil and water pollution; safeguard and enhance biodiversity, make sustainable use of natural resources, including land, and incorporate methods to make sure that sites are free of contamination. Remediation of land contamination is encouraged.<br><br>Policy SP17: Conservation and Enhancement of the Natural Environment: includes that developments will not be permitted where they will have an adverse impact upon the quality of natural resources including water and soil. |
| Neath Port Talbot Local Development Plan 2011–2026 <sup>14</sup><br><br>(Forestry Access Track is in this council boundary)            | Strategic Policy SP15 Biodiversity and Geodiversity relates to the protection of features including internationally, or nationally designated sites, RIGS, LNRs, and SINC's from development.<br>SP16 Environmental Protection: states that brownfield development is preferred over greenfield.<br>Policy EN8 relates to land contamination and land stability.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Rhondda Cynon Taf County Borough Council (RCTBC)                                                                                       | Policy AW10: Environmental Protection and Public Health: includes that development proposal will not be permitted where                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

<sup>11</sup> Welsh Government (2004). Minerals technical advice note (MTAN) Wales 1: aggregates. March 2004. Available at: [Minerals technical advice note \(MTAN\) Wales 1: aggregates | GOV.WALES](#) [Accessed July 2026]

<sup>12</sup> Welsh Government (2021). Written Statement: Publication of 'Future Wales – the national plan 2040' and Planning Policy Wales Edition 11. February 2021. Available at: [Written Statement: Publication of 'Future Wales – the national plan 2040' and Planning Policy Wales Edition 11 \(24 February 2021\) | GOV.WALES](#) [Accessed July 2026]

<sup>13</sup> Bridgend County Borough Council (2024) Adopted Replacement Local Development Plan 2018 – 2033. Available at: <https://www.bridgend.gov.uk/media/izcfp1f/written-statement.pdf> [Accessed July 2026].

<sup>14</sup> Neath Port Talbot County Borough Council (2016). Neath Port Talbot County Borough Council Local Development Plan (2011-2026). Available at: [https://media.npt.gov.uk/media/ca2fbumd/ldp\\_written\\_statement\\_jan16.pdf?v=20240823155047](https://media.npt.gov.uk/media/ca2fbumd/ldp_written_statement_jan16.pdf?v=20240823155047) (Accessed: July 2026).

| Planning Policy                                                                                                              | Context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Local Development Plan 2006 – 2021 (adopted March 2011) <sup>15</sup><br>(Forestry Access Track is in this council boundary) | they would result in unacceptable hard to health or local amenity due to contamination or land instability.<br><br>Policy AW13: Large Wind Farm Development: includes that deep peat areas are important for nature conservation and water storage and are significant ‘carbon sinks’. The design of windfarms and their associated infrastructure will need to take this into account to ensure that overall, the development contributes to reducing and not increasing carbon emissions. |

## Technical Guidance

11.2.4. A summary of the technical guidance for Ground Conditions is given in **Table 11.3**.

**Table 11.3 Technical guidance relevant to the Ground Conditions assessment**

| Technical guidance document                                                                        | Context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contaminated Land Statutory Guidance (2012) <sup>16</sup>                                          | This 2012 guidance from the Welsh Government outlines the legal framework for dealing with contaminated land in Wales under Part 2A of the Environmental Protection Act 1990. It elaborates on the remediation provisions of Part 2A, such as the goals of remediation, and how enforcing authorities should ensure that remediation requirements are reasonable.                                                                                                                                                                                                                                                                                                                                                                         |
| The Development of Land Affected by Contamination: A Guide for Developers, version 4 <sup>17</sup> | The guidance outlines the information planning authorities require on the land contamination status of proposed development sites and how associated planning conditions will be discharged. The document sets out best practice for land contamination management procedures. These follow a phased approach and require the development and refinement of a conceptual model. The process starts at initial desk-based assessment (phase 1, preliminary risk assessment), then may progress to site investigation (phase 2) and then to remediation options appraisal, development of a remediation strategy and implementation and verification of remediation, as set out in the Land Contamination Risk Management (LCRM) (EA 2025). |
| Guidance: Land contamination risk management (LCRM) <sup>18</sup>                                  | LCRM provides the technical framework for applying a risk management process when dealing with land affected by contamination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

<sup>15</sup> Rhondda Cynon Taf County Borough Council 2011, Rhondda Cynon Taf Local Development Plan up to 2021, available at: <https://www.rctcbc.gov.uk/EN/Resident/PlanningandBuildingControl/LocalDevelopmentPlans/RelateddocumentsLDP20062021/AdoptedLocalDevelopmentPlan.pdf> [accessed 10 July 2026]

<sup>16</sup> Welsh Government (2012). *Contaminated Land Statutory Guidance 2012*. Available at:

<https://www.gov.wales/sites/default/files/publications/2019-08/contaminated-land-statutory-guidance-2012.pdf> [Accessed July 2026]

<sup>17</sup> Welsh Government, Natural Resources Wales and CLILW WLGA (2023). *Development of Land Affected by Contamination: A Guide for Developers*. Available at: <https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/advice-for-developers/land-contamination/?lang=en> [Accessed July 2026]

<sup>18</sup> Environment Agency (2025). *Guidance: Land contamination risk management (LCRM), How to assess and manage the risks from historic land contamination*. Available at: <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>. [Accessed July 2026]

| Technical guidance document                                                                                                                                           | Context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAR-SOIL: Control of Asbestos Regulations 2012, Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials <sup>19</sup> | Provides interpretation and guidance to all involved in the management of asbestos in both soils and construction and demolition arising in accordance with the Control of Asbestos Regulations 2012 (CAR 2012). Requirements include the use of measures to prevent the spread of asbestos during construction work. This can include asbestos present on or in Made Ground.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| CL:AIRE October 2021: 'Good Practice for Risk Assessment for Coal Mine Gas Emissions' <sup>20</sup>                                                                   | Provides information on current understanding of coal mine gas risks and provides a decision framework for mine gas risk assessment intended to ensure robust mine gas risk assessments in the UK. This approach has been used in the PRAs completed for the Proposed Development ( <b>Appendix 11A</b> ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| CL:AIRE, Definition of Waste: Development Industry Code of Practice (DoWCoP), Version 2, 2011 <sup>21</sup>                                                           | The Definition of Waste: Development Industry Code of Practice (DoWCoP) is a voluntary Code launched in September 2008 (applicable to England and Wales) and updated in 2011 to provide a clear, concise, and auditable process to enable the sustainable remediation and development of land and suitable reuse of recovered materials/resources, including topsoil, subsoil, and potentially contaminated soil, that may initially be classified as waste/contaminated, by the use of a Materials Management Plan (MMP). It should be noted that use of a DoWCoP compliant MMP may not be appropriate if mining wastes are present, in this scenario a Site Waste Management Plan (SWMP) could be used in place of an MMP.                                                                                                                                                                                               |
| Welsh Government, Agricultural Soil Policy Statement, 2025 <sup>22</sup>                                                                                              | <p>Sets out the Welsh Government's vision for the protection and sustainable management of agricultural soils in Wales, with reference to The Agriculture (Wales) Act, Sustainable Farming Scheme and Environment (Wales) Act 2016. Notes that agricultural soils are an ecologically, economically and socially valuable resource in Wales, representing at least 80% of the land area in Wales, and that they are considered a finite resource due to slow soil formation rates. Valued soil functions are defined as:</p> <ul style="list-style-type: none"> <li>■ providing the basis for food, biomass derived energy, and raw materials;</li> <li>■ regulating environmental cycles of nutrients and carbon;</li> <li>■ providing valued habitats and sustaining biodiversity;</li> <li>■ regulating water flow and quality;</li> <li>■ regulating climate and mitigating some impacts of climate change;</li> </ul> |

<sup>19</sup> Joint Industry Working Group (JIWG) (2016). *CAR-SOIL, Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials*. Available at: <https://claire.co.uk/projects-and-initiatives/asbestos-in-soil.html> [Accessed July 2026]

<sup>20</sup> CL:AIRE (2021) Good Practice for Risk Assessment for Coal Mine Gas Emissions. Available at: <https://claire.co.uk/home/news-new/new-cl-aire-publication.html> [Accessed August 2026]

<sup>21</sup> CL:AIRE (2011) Definition of Waste: Code of Practice, Version 2 (online) Available at: <https://staging.claire.co.uk/projects-and-initiatives/dow-cop>. Accessed August 2025.

<sup>22</sup> Welsh Government (2025) *Agricultural Soil Policy Statement, 2025*. Available at: <https://www.gov.wales/sites/default/files/publications/2025-04/agricultural-soil-policy-statement.pdf>. [Accessed July 2026]

| Technical guidance document                                                                                              | Context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                          | <ul style="list-style-type: none"> <li>■ preserving cultural and archaeological heritage; and</li> <li>■ providing a platform for infrastructure.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Welsh Government, 2018-19 Soil Policy Evidence Programme <sup>23</sup>                                                   | <ul style="list-style-type: none"> <li>■ This identifies threats to soil in Wales, including soil loss to development, as listed below.</li> <li>■ Climate change (arable, grassland and forest);</li> <li>■ Soil compaction (mainly arable, intensive grassland and forestry)</li> <li>■ Soil erosion (mainly arable);</li> <li>■ Loss of soil organic matter (SOM) and loss of soil biodiversity (arable);</li> <li>■ Soil loss to development/soil sealing (arable and grassland); and</li> <li>■ Soil contamination (arable and grassland).</li> <li>■ It concludes that in relation to development:</li> <li>■ The use of the 'best' agricultural or habitat soils for development should be avoided; and</li> <li>■ The Best and Most Versatile (BMV) land protected under current Planning Policy in Wales (Welsh Government, 2018) includes ALC land classified as grades 1, 2 and 3a. Given the finite amount of land in Wales, that this protects, there may be a case for extending protection to include land graded as 3b in some cases.</li> </ul> |
| Welsh Government Predictive Agricultural Land Classification Map (Wales), The Hollington Map Guidance Note <sup>24</sup> | Notes that Agricultural Land Classification (ALC) grade should be determined in order to be able to apply Planning Policy in development management decisions. Where the Predictive Agricultural Land Classification Map identifies grades 1, 2 or 3a (BMV land), a survey will be required to determine the ALC Grades present and in what proportion. States that the Land Quality Advisory Service (LQAS) will provide advice on survey requirements and validate ALC surveys for Local Planning Authorities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Highways England, Design Manual for Roads and Bridges, LA 109 – Geology and Soils                                        | Sets out the approach to assessing and reporting the effects of highway projects on geology and soils used on Highways England projects. As a published approach to assessing the effects of developments on soil in EIA, this can be adapted for use on other projects. The guidance stops short of providing a methodology to assess the effects of a project on agricultural land and soil functions. This guidance informs the assessment methodology for soils as set out in <b>Section 11.8</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Institute of Civil Engineers (ICE), The Environmental                                                                    | Provides an approach to assessing the potentially significant effects of development projects on soil and defines the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

<sup>23</sup> 2018-19 Soil Policy Evidence Programme Assessment of Welsh Soil Issues in Context, 4th October 2019

Report code: SPEP2018-19/01. Available at: [https://www.gov.wales/sites/default/files/publications/2021-04/assessment-soil-issues-in-context\\_0.pdf](https://www.gov.wales/sites/default/files/publications/2021-04/assessment-soil-issues-in-context_0.pdf). [Accessed July 2026]

<sup>24</sup> Welsh Government (2021) Predictive Agricultural Land Classification Map (Wales), The Hollington Map Guidance Note, Version 2.1 - May 2021. Available at: <https://www.gov.wales/agricultural-land-classification-predictive-map-guidance>. [Accessed July 2026]

| Technical guidance document                                                                                                                                                                                                                            | Context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Impact Handbook – A Practical Guide for Planners, Developers and Communities (3rd Edition) <sup>25</sup>                                                                                                                                               | sensitivity of different soil types to handling during construction projects. The guide notes that soil is a non-renewable resource, and that disturbance should be limited as far as possible, that soil is particularly prone to structural degradation if it is handled when too wet and that adverse effects can be mitigated by following best practice guidance, such as the Defra 2009 Code of Practice for the Sustainable Use of Soils on Construction Sites.                                                  |
| Institute of Environmental Management & Assessment (IEMA) (2022), now known as the Institute of Sustainability (ISEP) and Environmental Professionals, IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment <sup>26</sup> | Provides information and guidance on how the practical implications of soil functions, soil biodiversity, soil health, ecosystem services and natural capital should be applied within the overarching framework of climate change, to incorporate them effectively into the EIA process. This guidance develops the methodology for assessing impacts on soil resources in LA 109 and the assessment methodology for soils is therefore based on the IEMA Land and Soils guidance, as set out in <b>Section 11.8</b> . |
| Defra, Construction Code of Practice for the Sustainable Use of Soils on Construction Sites <sup>27</sup>                                                                                                                                              | Outlines current guidance and relevant legislation concerning the use of soil in construction projects, before offering stage by stage guidance on the use, management, and movement of soil on site, and the completion of appropriate soil resource surveys to inform the site working strategy and for the construction phase preparation of a Soil Management Plan and Soil Resource Plan (in conjunction with other management plans such as a Site Waste Management Plan or Material Management Plan).            |
| The Institute of Quarrying, Good Practice Guide for Handling Soils in Mineral Workings, 2021 <sup>28</sup>                                                                                                                                             | Presents best practice guidance for soil handling, including measures to minimise the compaction of soils as they are handled, with minimal reliance on the need for remedial treatment of compaction.                                                                                                                                                                                                                                                                                                                  |
| Scottish Government, Scottish Natural Heritage (SNH), Scottish Environment Protection Agency (SEPA) (2017) Peatland Survey. Guidance on Developments on Peatland <sup>29</sup>                                                                         | The Scottish Government, SNH (now NatureScot) and SEPA guidance for peatland survey sets out a phased approach to quantifying and qualifying peat material on site and provides advice on how to publish peat surveys as part of wider site investigations for development management applications, with a particular focus on win farm developments. There is no equivalent guidance published by the Welsh authorities.                                                                                               |
| Natural Resources Wales, Assessing afforested deep                                                                                                                                                                                                     | Guidance relates to afforested deep peat but there is no equivalent guide for undertaking a peat assessment within                                                                                                                                                                                                                                                                                                                                                                                                      |

<sup>25</sup> Institute of Civil Engineers (ICE) (2019). *The Environmental Impact Assessment Handbook – A Practical Guide for Planners, Developers and Communities* (3rd Edition). ICE Publishing London, UK.

<sup>26</sup> Stapleton, C., Reed, E., Gemmell, L., Adams, K. (eds) (2021) *IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment*. Available at: [https://www.iema.net/media/3xejdu0u/2022-iema\\_land\\_and\\_soils\\_guidance.pdf](https://www.iema.net/media/3xejdu0u/2022-iema_land_and_soils_guidance.pdf). [Accessed July 2026].

<sup>27</sup> Defra (2018). *Guidance: Code of practice for the sustainable use of soils on construction sites*. Available at: <https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites> [Accessed July 2026].

<sup>28</sup> The Institute of Quarrying (2021). *Good Practice Guide for Handling Soils in Mineral Workings*. Available at <https://www.quarrying.org/soils-guidance>. [Accessed March 2026].

<sup>29</sup> Scottish Government, Scottish Natural Heritage, SEPA (2017). *Peatland Survey: Guidance on Developments on Peatland*. Available at: <https://www.gov.scot/publications/peatland-survey-guidance/>. [Accessed March 2026].

| Technical guidance document                                                                                                                                | Context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| peat to inform restocking decisions: Guidance note, 2026 <sup>30</sup>                                                                                     | <p>agricultural land. The guide is intended for owners and managers of existing forests and woodlands that are known to be, or may be, located on 'deep peat'*, or hydrologically connected to deep peat, which can also apply to farmland.</p> <p>For a scoping survey (to be undertaken once a desk-based assessment has identified that deep peat may be present), a survey is recommended on a one point per hectare grid basis across the survey area, extending beyond the potential peat area where possible. It is also recommended that two probes are completed at each location, with the second probe providing a check on the first result in case a piece of bog wood (or another obstruction) gives a misleading impression of depth. As well as probes, it is recommended that peat cores also need to be taken to ensure that peat is present and not soft in-wash clays. These are suggested on a one peat core per 10 hectares basis (or at least one core per site).</p> <p>*In the context of this guidance deep peat means peat of 50cm thickness or greater, which is the same definition as used in Scotland.</p> |
| Society for the Environment (SocEnv), Soil Management Hierarchy in Rural Settings and The Ten Principles of Good Soils and Stones Management <sup>31</sup> | The soil management hierarchy forms one of the SocEnv Ten Principles of Good Soils and Stones Management and was developed as part of the SocEnv Soils and Stones Project. This sets out a hierarchy to avoid or minimise impacts on soils, with 'no or minimal soil disturbance' at the top of the hierarchy and 'site development which requires soil materials to be removed at the bottom of the hierarchy'.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Construction Industry Research and Information Association (CIRIA) reports<sup>32</sup>:</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Report C809 Sustainable Management of Surplus Soils                                                                                                        | This guide is concerned with the management of surplus soils, by particular developers, contractors, and consultants, to ensure that projects are designed with materials and waste management in mind from the start. The 'designing out' and management of surplus soils and aggregates arising on, and from, construction and development projects can be complex, and the guide collates and summarises existing information and legal frameworks to improve understanding across all UK development sectors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Environmental good practice on site guide (fifth edition) (C811)                                                                                           | Provides practical guidance on delivering sustainable construction at the site level, which includes ecology, protected species and habitats, historic environments and archaeological remains, land contamination, nuisance (e.g. noise, vibration, lighting, dust, emissions, odours), resources (e.g. energy,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

<sup>30</sup> Natural Resources Wales (2026) Assessing afforested deep peat to inform restocking decisions: Guidance note, Reference number: GN 039. Available at: <https://naturalresourceswales.gov.uk/guidance-and-advice/environmental-topics/trees-woodlands-and-forests/identify-and-manage-deep-peat-on-your-woodland/?lang=en>.

<sup>31</sup> Society for the Environment (2025). SocEnv Soil Management Hierarchy in Rural Settings. Available at: <https://socenv.org.uk/resource/socenv-soil-management-hierarchy-rural-settings/> (Accessed: July 2026).

<sup>32</sup> CIRIA reports. Available at: [https://www.ciria.org/CIRIA/Resources/Resource\\_overview/Resources/Resources\\_overview.aspx](https://www.ciria.org/CIRIA/Resources/Resource_overview/Resources/Resources_overview.aspx) [Accessed July 2026]

| Technical guidance document | Context                                                                            |
|-----------------------------|------------------------------------------------------------------------------------|
|                             | materials, water and waste), and traffic and travel arrangements, and vehicle use. |

- 11.2.5. In policy settings, for Welsh sites, the definition of “peat” as defined by the National Peatland Action Programme (NPAP)<sup>33</sup> is used:
- more than 40cm of organic (O horizon) material within the upper 80cm, excluding fresh litter (L) and living moss; or,
  - more than 30cm of organic (O horizon) material resting directly on the bedrock (R or Cr) or extremely stony material; and
  - no overlying non-humus material mineral horizon that has a colour value of 4 or more and extends below 30cm depth.
- 11.2.6. For this assessment, regarding ‘peat’ as defined in the NPAP<sup>27</sup>, and in the Phase 1 Soil and Peat Survey (**Appendix 11B**), a conservative threshold has been applied where any peat with  $\geq 0.3\text{m}$  thickness is considered to meet the criteria for peat soil with high sensitivity according to **Table 11.13**:
- Peat - Any profile with peat material  $\geq 0.3\text{m}$  thickness (also referred to as ‘peat soil’ as opposed to ‘peaty soil’, see item below); and
  - Peaty soils - Any horizon description with “very organic” soils  $< 0.4\text{m}$  or peat  $< 0.3\text{m}$  thickness.
- 11.2.7. If peat is later confirmed by survey, then the sensitivity of adjoining peaty soils may need to be increased, reflecting the sensitivity of soils at the edges of peatland habitat, if present, this will be considered in the assessment in the Final ES based on further soil resources and peat survey (see **Section 11.16**).

## 11.3 Consultation and Engagement

### Overview

- 11.3.1. The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in **Chapter 2: Legislation and Policy Context**.

### Scoping Opinion

- 11.3.2. A Scoping Direction was issued by the Planning Inspectorate, on behalf of the Welsh Ministers, on 12 June 2026. A summary of the relevant responses received in the Scoping Opinion in relation to Ground Conditions and confirmation of how these have been addressed within the assessment to date is presented in **Table 11.4**.
- 11.3.3. At this stage, not all of the Scoping Direction comments have been addressed at this stage, however, all comments will be addressed within the ES.

<sup>33</sup> NRW (2020) National Peatland Action Programme 2020-2025. Available at: [National Peatlands Action Programme, 2020-2025](#) [Accessed July 2026]

**Table 11.4 Summary of EIA Scoping Direction Responses for Ground Conditions**

| Consultee                                       | Consideration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | How addressed in this Draft ES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Planning and Environment Decisions Wales (PEDW) | <p>Neath Port Talbot Council (NPTC) highlight that where peat or peat-forming soils are present, it is expected that the assessment will include appropriate peat depth surveys and where necessary a peat management strategy.</p> <p>NRW and LQAS advise that further information is required to confirm the presence or absence of peat across the site. NRW also notes that the access track has not been assessed with regards to peat.</p> <p>LQAS and NRW welcome that the Peatland of Wales map has been used and also require that a Phase 1 peat survey is undertaken conducted across a 100 m grid, supported by confirmatory coring. Peat data should be mapped with site location, interpolated peat depth (extended into survey area), probing location and cores/auger (to confirm the probing is reliable), before it can be confirmed if a phase 2 peat survey is required. A Peat Management Plan may need to be provided if peat is present.</p> <p>NRW request that Phase 1 habitat survey of the whole site and NVC surveys of semi-natural vegetation are presented alongside peat depth mapping to inform understanding of the impacts on peat and peatland habitat (Scoping Direction ID 60).</p> | <p>A peat survey was completed for the Scoping Report and is included as <b>Appendix 11B</b>.</p> <p>A soil resources survey will be undertaken for the Development Site, and a peat survey will be undertaken along the upgraded sections of the forestry access track to confirm the soil profiles present in the wind farm development site and confirm whether peat is present along the access route, if road upgrades are required as part of the Proposed Development. The Geoenvironmental PRA for the Northern and Southern Array includes recommendations for ground investigation needed to provide further information on Ground Conditions in regard to land contamination and/or ground stability.</p> <p>Coal Mining Risk Assessments (CMRA) are in progress for both the Northern and Southern Array. The completed CMRAs will be included in the Final ES and the PRAs will be updated accordingly for the Final ES. Draft PRAs are included in <b>Appendix 11A</b>.</p> |
| Natural Resources Wales (NRW)                   | <p>NRW advise that effects on peat should be scoped in.</p> <p>Based on the information currently available in the scoping report, the extent of peat within the site is likely to be localised and project infrastructure may be capable of avoiding peatland impacts.</p> <p>Therefore, further information is required to confirm the presence or absence of peat across the whole site, to enable a full assessment of the impacts on peat and peatlands.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>A peat survey was completed for the Draft ES and is included as <b>Appendix 11B</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Consultee | Consideration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | How addressed in this Draft ES                                                              |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| NRW       | <p>NRW welcome the use of the Peatland of Wales map to indicate the presence of peat, which appears to be localised to the Northern array. NRW note that the map may not represent the full extent of peat and deep organic soils at the site, but should be utilised as first step of development.</p> <p>NRW recommend a phase 1 peat survey, on a 100 m grid and supported by confirmatory coring. NRW request the peat data is mapped with site location, interpolated peat depth (extended into survey area), probing location and cores/auger, before recommending if a phase 2 peat survey is required. This is required to confirm presence or absence of peat across the site and to meet the stepwise approach laid out in PPW12.</p> <p>For subsequent soil surveys, NRW recommends use of the definition of peat soils as defined by the Soil Survey of England and Wales (1980) as:</p> <ol style="list-style-type: none"> <li>1. More than 40cm of organic (O horizon) material within the upper 80cm, excluding fresh litter (L) and living moss; or</li> <li>2. More than 30cm of organic (O horizon) material resting directly on bedrock (R or Cr) or skeletal material (in situ angular broken-up rock) and</li> <li>3. No overlying non-humose mineral horizon that has a colour value of 4 or more and extends below 30cm depth."</li> </ol> <p>NRW also recommend the following additional definition:</p> <p>"Where shallow organic soils under 30 cm deep are also supporting peatland habitat and/or integral to the hydrological functioning of wider peat bodies, these should also be defined as peatland habitats."</p> | <p>A peat survey was completed for the Draft ES and is included as <b>Appendix 11B</b>.</p> |
| NRW       | NRW note that the Forestry Access Track has not been assessed with                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The baseline in <b>Section 11.5</b> now includes the forestry Access Track.                 |

| Consultee | Consideration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | How addressed in this Draft ES                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <p>regards to peat and that The Peatland of Wales maps show a large extent of peat north of Abergwynfi, where the track extends to.</p> <p>NRW therefore requests plans for upgrading tracks, along with phase 1 habitat mapping and phase 1 peat survey as a minimum, to ensure there are no impacts on peat or peatland habitats.</p> <p>It is recommended that peat survey for track upgrading should be conducted on a 50m interval at an offset of 10m on any areas of track widening. Where peat is found the sampling needs to be conducted at 25m grid to 30m grid either side of the track to ensure a high enough sampling resolution. Peat depth sampling needs to be supported by confirmatory coring.</p> | <p>Assessment of potential effects associated with the Forestry Access Track have not been undertaken for Draft ES due to design information not yet being available. This will be reviewed for the ES and assessment of effects on ground conditions receptors included if required.</p> <p>Following further surveys, peat survey results for the proposed upgraded sections of the Forestry Access Track will be appended to the final ES.</p> |
| NRW       | The peat and organic soil data obtained by hand auguring and other peat condition data should be presented along with correlation to overlaying vegetation type and communities. Peat depth mapping also needs to be presented against all planned development and associated plans for soil movement (if occurring).                                                                                                                                                                                                                                                                                                                                                                                                  | The peat survey report includes soil data, see <b>Appendix 11B</b> .                                                                                                                                                                                                                                                                                                                                                                              |
| LQAS      | LQAS advises that a soil management plan should be prepared for the Proposed Development, informed by a baseline soil resources and physical characteristics report, and be considered as part of the ES process. This is to set out how all soils and their functions will be conserved during construction. LQAS also requests consideration of how soils will be reinstated at decommissioning. The Applicant should refer to LQAS response in Appendix 1 for further information regarding requirements for the SMS (Scoping Direction ID 61).                                                                                                                                                                     | Further soil resource survey will be undertaken prior to the Final ES to inform the assessment and soil management planning.                                                                                                                                                                                                                                                                                                                      |
| LQAS      | LQAS confirm that no BMV land is present on site and effects on BMV land can be scoped out of the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Agreement noted. Effects on agricultural land are scoped out however effects on soil resources                                                                                                                                                                                                                                                                                                                                                    |

| Consultee                              | Consideration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | How addressed in this Draft ES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        | assessment. LQAS adds that detailed ALC field survey is not requested but may be beneficial in supporting baseline soil resources and physical characteristics information for the site (Scoping Direction ID 62).                                                                                                                                                                                                                                                                                                                                                                                                             | are scoped in and the assessment is in <b>Section 11.11</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Bridgend County Borough Council (BCBC) | BCBC note that the site is located within a Category 1 and 2 Sandstone Mineral Safeguarding Zones as defined by Policy ENT12 of the RLDP. Development proposals within mineral safeguarding zones, either permanent or temporary, need to demonstrate that if permanent development, the mineral can be extracted prior to the development, and/or the mineral is present in such limited quantity or quality to make extraction of no or little value as a finite resource; and in the case of temporary development, it can be implemented, and the site restored within the timescale the mineral is likely to be required. | Almost the entirety of BCBC is within a Sandstone Mineral Safeguarding area. Furthermore, the Proposed Development has a finite life at 30 years at which point it may be decommissioned. Minerals would therefore not be sterilised permanently over the vast majority of the Site. The policy recognises that development can be approved in the safeguarding areas where there is an overriding need for the development (various other criteria are met). The overriding need for the Proposed Development is established in Future Wales. It is considered that the overwhelming need to reduce GHG emissions, meet climate targets, and increase renewable energy outweighs the very limited loss of land in the safeguarding area. |

## Technical Engagement

- 11.3.4. No additional technical engagement with consultees has taken place in relation to Ground Conditions.

## 11.4 Data gathering methodology

### Study area

- 11.4.1. The Study Area for Ground Conditions includes the Development Site and a 250m buffer area for land contamination receptors, and a 250m buffer area beyond the boundary for all other ground conditions receptors, as described below.
- 11.4.2. The conceptual model for land contamination considers the environmental setting (including geology, hydrogeology and hydrology) and the nature and extent of the identified potential contamination sources, potential receptors and available pathways for receptors to be exposed to contaminants.
- 11.4.3. Likely significant effects of the Proposed Development on soil receptors include temporary effects during construction activity, such as vehicle/plant movements, soil handling,

storage, and reinstatement, and permanent effects (e.g., permanent removal or sealing of soil for construction of buildings), that will occur within the Site.

- 11.4.4. Effects on geological receptors could include permanent damage during construction, or permanent change to geological features or public access to these features due to construction of buildings or other structures in or around the geological features. Based on the nature of the Proposed Development and the baseline conditions described below in **Section 11.5**, an external zone of influence of 250m beyond the Development Site has been assigned.
- 11.4.5. The rationale for the Study Area is that the soils and geology are geographically discrete and are unlikely to be substantially influenced by changes to their surroundings or vice versa. However, the inclusion of a 250m buffer means that effects such as damage to a sensitive offsite geological feature due to ground disturbance during construction, or in relation to excavations, hydrogeological effects of dewatering on sensitive offsite receptors such as peat, are considered in the assessment. Assessment of hydrogeological effects is included in **Chapter 10: Water Environment**.

## Desk Study

- 11.4.6. A summary of the organisations that have supplied data, together with the nature of that data is outlined in **Table 11.5**.

**Table 11.5 Data sources used to inform the Ground Conditions assessment**

| Organisation                                                             | Data Source                                                                                                                                 | Data provided                                                                                                                                 |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| British Geological Survey (BGS)                                          | British Geological Survey (BGS) Onshore GeoIndex <sup>34</sup> for geological information, including exploratory hole records.              | Information on superficial and bedrock geology, historical borehole records.                                                                  |
| The Coal Authority (now known as the Mining Remediation Authority (MRA)) | Consultants Coal Mining Report: Pwll Y Lwrch - Northern Array Bridgend (Ref: 51003577447001). Included as an annex to <b>Appendix 11A</b> . | Site specific coal mining information identifying potential mining related risks.<br><br>This report provides coverage of the Northern Array. |
| MRA                                                                      | Consultants Coal Mining Report: Pwll Y Lwrch – Southern Array Bridgend (Ref: 51003577454001). Included as an annex to <b>Appendix 11A</b> . | Site specific coal mining information identifying potential mining related risks.<br><br>This report provides coverage of the Southern Array. |
| Mining Remediation Authority                                             | Mining Remediation Authority - Interactive map for mining information <sup>35</sup>                                                         | Coal mining information including recorded mine entries, shallow coal mining workings, coal outcrops,                                         |

<sup>34</sup> BGS Geoindex. Available at: <https://mapapps2.bgs.ac.uk/geoindex/home.html>. Accessed July 2026.

<sup>35</sup> Mining Remediation Authority. Available at: <https://datamine-cauk.hub.arcgis.com/>. Accessed July 2026.

| Organisation                     | Data Source                                                                                                                                                                                                                                                                                                                                                                                                                                            | Data provided                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                        | fissures and breaklines, and Development High Risk Areas.                                                                                                                                                                                                                                                                                                                                                                                                           |
| Groundsure                       | Groundsure Insight Report, Pwll y Lwrch - Northern Array – Order Ref: WSP-ED6-YPM-8S8-AWO. Included as an annex to <b>Appendix 11A</b> .                                                                                                                                                                                                                                                                                                               | Environmental dataset and historical maps for the Site, plus a minimum 500m buffer.                                                                                                                                                                                                                                                                                                                                                                                 |
| Groundsure                       | Groundsure Insight Report, Pwll y Lwrch – Southern Array – Order Ref: WSP-3ZB-8A9-1VC-8GU. Included as an annex to <b>Appendix 11A</b> .                                                                                                                                                                                                                                                                                                               | Environmental dataset and historical maps for the Site, plus a minimum 500m buffer.                                                                                                                                                                                                                                                                                                                                                                                 |
| LandIS                           | LandIS - Soilscales Map <sup>36</sup>                                                                                                                                                                                                                                                                                                                                                                                                                  | Regional soil mapping and information on soil types.                                                                                                                                                                                                                                                                                                                                                                                                                |
| National Library of Scotland     | Historical Maps <sup>37</sup>                                                                                                                                                                                                                                                                                                                                                                                                                          | Historical OS maps available to view online.                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Welsh Government - Datamap Wales | Datamap Wales <sup>38</sup> <ul style="list-style-type: none"> <li>• Predictive Agricultural Land Classification Map</li> <li>• Unified Peat Map of Wales</li> <li>• Geological Conservation Review (GCR) Site Boundaries</li> <li>• Regionally Important Geodiversity Sites (RIGS)</li> <li>• Aggregates Resource Areas</li> </ul> Sites of Special Scientific Interest and other statutory and non-statutory environmental conservation designations | Main source of public sector environmental data for Wales, available to view on the online map viewer or to download.                                                                                                                                                                                                                                                                                                                                               |
| WSP (2026)                       | PRAs for the Glanllynfi Garth Wind Farm: Southern Array and Northern Array ( <b>Appendix 11A</b> )                                                                                                                                                                                                                                                                                                                                                     | PRAs to assist in determining whether the Site is suitable for its proposed use, included in <b>Appendix 11A</b> . The report includes a review of selected contemporary information including geological, environmental, hydrological and hydrogeological data, review of historical mapping for the Development Site and its surroundings. It includes the development of a Conceptual Model (CM) and a Tier 1: Preliminary Risk Assessment, to assess the status |

<sup>36</sup> LandIS. Soilscales. Available at: <https://www.landis.org.uk/soilscales>. Accessed July 2027.

<sup>37</sup> National Library of Scotland. Map Viewer. Available at: (available online <https://maps.nls.uk/>). Accessed July 2026.

<sup>38</sup> Welsh Government. Available at: available online at: <https://datamap.gov.wales/>. Accessed July 2027.

| Organisation | Data Source | Data provided                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |             | <p>of potential contamination and identify potentially significant contaminant linkages that require further consideration in line with current guidance including Land Contamination Risk Management (LCRM) guidance published by the Environment Agency. It also identifies information gaps, geo-environmental development constraints, geohazards and requirements for further assessment.</p> <p>At the time of producing the Draft ES, the PRAs are still awaiting site walkover survey information. The walkovers will be completed prior to the Final ES and the PRAs updated as required, to allow identification of potential evidence of contamination and verify desk study information as necessary.</p> |

## Survey work

- 11.4.7. A Phase 1 Peat Depth Survey was completed by WSP in July 2026. The survey was undertaken on a 100m x 100m grid (roughly one point per hectare) of 188 probe points across land within the Northern and Southern Array and supported by confirmatory soil profile analyses, using coring and survey notes on exposed soil faces and animal arisings.
- 11.4.8. At the time of producing the Draft ES, the PRAs are still awaiting site walkover survey information. The walkovers will be completed prior to the Final ES and the PRAs updated as required.

## 11.5 Overall baseline

### Current baseline

- 11.5.1. This section summaries the baseline Ground Conditions, including Geology, Soils and agricultural land classification, determined through the course of desk-based and field survey investigations. This section identifies and evaluates those Geology and Soils features/receptors that lie within the Study Area, and which are pertinent in the context of the Proposed Development.
- 11.5.2. For the purposes of this baseline section, the Proposed Development is described in three parts as follows:
- Northern Array – located on the upper slopes of Mynydd Pwll-yr-Lwrch. The site will comprise four wind turbines (T1 – T4). National Grid Reference: 287008, 192839.

- Southern Array – located on the slopes of Moel Cynhordy. The site will comprise four wind turbines (T5 – T8). National Grid Reference: 288988, 189854.
- Forestry Access Track– track that extends from the public highway to the Northern and Southern Array areas.

11.5.3. For the purpose of this report, only the Northern and Southern Arrays are considered for future baseline at this stage. The Forestry Access Track will be considered within the Final ES following further survey work.

## Land use and environmental setting

- 11.5.4. The Proposed Development is located across two land parcels, the Northern & Southern Array. The parcels comprise semi-improved grassland, marshy grassland and heathland, which are situated in the local authority area of BCBC. A Forestry Access Track is also included within the Development Site, extending from the A4061 to each of the land parcels.
- 11.5.5. The Northern Array is located within Pwll-yr-lwrch and comprises an upland plateau landscape with numerous steep-sided valleys, comprised of semi-improved grassland, marshy grassland, and heathland.
- 11.5.6. The Southern Array comprises an upland plateau landscape with numerous steep-sided valleys, comprised of semi-improved grassland, marshy grassland, and heathland. The land is open access (NRW Public Forest 2014)<sup>39</sup>, and numerous public footpaths run across the Southern Array. Two springs commence in the central part of the Southern Array at the northern boundary at the top of the slope. The streams flow in a south-easterly direction, converging in the southern part of the Southern Array at the site boundary. The eastern spring is labelled 'Cwm Cedfyw', and the stream labelled 'Nant Cedfyw' on OS mapping.
- 11.5.7. Both Northern and Southern Array sites are currently used for agriculture, mainly sheep grazing, and some limited crop growing. The nearest settlement is Maesteg, the outskirts of which are approximately 1km to the west of the Northern Array and 1.5km west of the Southern Array. There are a number of isolated residential properties located with 1km of each parcel.
- 11.5.8. The PEA which forms **Appendix 8A to Chapter 8: Biodiversity** confirms that there are no sites with international or national nature conservation designations within the Northern or Southern Array or within 250m of them. However, the PEA does not include the Forestry Access Track and information published by Natural Resources Wales confirms that the northern extent of the Forestry Access Track intersects the Cwm Gwrelych and Nant Llyn Fach Streams SSSI and is adjacent to the Craig-y-Llyn SSSI, both are designated for their biological features.
- 11.5.9. **Chapter 8: Biodiversity** identifies a Site of Importance for Nature Conservation (SINC) partially within the Southern Array. This is described as follows:
- Nant-y-Fforest – Comprises the habitats: marsh/marshy grassland; wet dwarf shrub heath; dry heath/acid grassland mosaic; dry modified bog-moss bog; semi-improved

<sup>39</sup> NRW DataMap Wales (2014). [Open Access - Dedicated Forests | DataMapWales](#)

acid grassland; broadleaved semi-natural woodland; acid/neutral flush; and acid dry dwarf shrub.

- 11.5.10. Disturbance to soils within the SINC will be avoided by temporary and permanent development for Proposed Development.
- 11.5.11. Details of surface watercourses and groundwater within the Northern and Southern Array sites and study area and information on flood risk are provided in **Chapter 10: Water Environment**, and these are also detailed in the PRAs in **Appendix 11A**.
- 11.5.12. The baseline in this section will be updated as needed in relation to the Forestry Access Track as required for the Final ES.

## Geology and Geodiversity

- 11.5.13. Information on DataMap Wales<sup>33</sup> confirms that there are no Geological Conservation Review (GCR) sites or geological Sites of Special Scientific Interest (SSSI) across the Northern and Southern Arrays or within 250m of them.
- 11.5.14. Information on DataMap Wales<sup>33</sup> confirms the presence of one geological SSSI within the northern extent of the Forestry Access Track. This comprises the geological site of Cwm Gwrelych and Nant Llyn Fach Streams.

## Superficial geology

- 11.5.15. Details of superficial deposits mapped across the Proposed Development areas are summarised in **Table 11.6**. Coverage of superficial deposits across the Development Site is detailed in **Figure 11.2**.

**Table 11.6 Superficial Geology**

| Area of Proposed Development | Superficial geology (BGS, 1:50,000) <sup>40</sup>                                                                                                                                                                                                                                                                       |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Northern Array               | No superficial deposits mapped on site. Localised Peat deposits mapped 20m north.                                                                                                                                                                                                                                       |
| Southern Array               | No superficial deposits mapped on site.                                                                                                                                                                                                                                                                                 |
| Forestry access track        | No superficial deposits are present south of Upper Ogmre Windfarm. As the access track moves north from this point, large areas of peat are mapped, becoming more localised as the track turns to the west. As the track turns north and onwards towards Rhigos Road / A4061, several areas of Glacial Till are mapped. |

## Bedrock geology

- 11.5.16. The bedrock mapped across the Proposed Development areas and linear features including faults, are summarised in **Table 11.7**. Lithologies underlying the Proposed Development are detailed in **Figure 11.3**.

<sup>40</sup> British Geological Survey (BGS). GeoIndex Onshore. Available at: [https://mapapps2.bgs.ac.uk/geoindex/home.html?\\_ga=2.168180769.1858875516.1775115201-1363963820.1775115201](https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.168180769.1858875516.1775115201-1363963820.1775115201). Accessed July 2026.

**Table 11.7 Bedrock geology & Faults / Linear Features**

| Area of Proposed Development | Bedrock geology & Faults / Linear Features (BGS 1:50,000) <sup>35</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Northern Array               | <p>Area is predominantly underlain by the Llynfi-Member Sandstone, with a band Of Llynfi-Member Mudstone/Siltstone in the northeast of the area. Both members belong to the Pennant Sandstone Formation (PES). The Llynfi-member comprises green-grey and blue-grey, feldspathic, micaceous lithic arenites with thin mudstone/siltstone and seatearth interbeds and mainly thin coals.</p> <p>The South Wales Upper Coal Measures Formation, of the South Wales Coal Measures Group (SWCM) encroaches the western boundary of the area, comprising grey coal-bearing mudstones/siltstones with seatearths and minor grey, quartz-rich sandstones, coals and ironstones.</p> <p>A number of faults are present at an approximate northwest-southeast orientation in the northeast corner of the area, along with a fault running north-south along the western boundary and another running east-west along the southern boundary. A fault is also present running northwest-southeast, demarcating the southwest corner of the area.</p> <p>An inferred coal seam is also located around the south, west and north-west corner at the geological boundary between the Llynfi Member Sandstone and South Wales Upper Coal Measures Formation, as well as in the north-east area of the Site.</p> |
| Southern Array               | <p>Area is almost entirely underlain by the Rhondda Member, of the PES. Member comprises green-grey, lithic arenites with thin mudstone/siltstone and seatearth interbeds and mainly thin coals. A thin seam of the Llynfi Member is present in the most northern extent of the area.</p> <p>A fault running northeast-southwest is present in the most northern extent of the site. Two faults are present in the southwest of the of the area, running from northeast-southwest to east-west. Another two faults are present in the east of the site, running north-south.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Forestry Access Track        | <p>Area comprises primarily the Rhondda Member of the PES. Five other bedrock units intersect this area. These are similar Pennant Sandstones and coal-bearing mudstones and siltstones of the South Wales Middle &amp; Upper Coal Measures Formation, Llynfi Member, Brithdir Member and Rhondda Member.</p> <p>There is one fault that intersects this area, south of the A4107 carriageway, oriented northwest – southeast. There are several inferred faults across the forest access track, primarily oriented northwest-southeast.</p> <p>There are several inferred coal seams and marine bands that intersect the area.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## Made Ground / Artificial Ground

- 11.5.17. No Artificial / Made Ground is mapped across the Northern Array, Southern Array or Forestry Access Track. However, there is potential for Made Ground to be present due to the legacy coal mining and other mineral extractions within the Development Site.

## Mass Movement

- 11.5.18. Details of mass movement deposits mapped across the Development Site are summarised in **Table 11.8**.

**Table 11.8 Mass movement deposits**

| Area of Proposed Development | Mass movement (BGS 1:50,000) <sup>35</sup>                                                                                                                       |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Northern Array               | None mapped.                                                                                                                                                     |
| Southern Array               | None mapped.                                                                                                                                                     |
| Forestry Access Track        | Localised small areas of landslide deposits in the land surrounding this area, with one area that intersects the forest access track towards the Southern Array. |

## Mineral Resources

- 11.5.19. LDP Policy SP8 identifies that the Development Site (Northern Array, Southern Array and Forestry Access Track), is within the BCBC mineral safeguarding boundary for Sandstone. It states that the Council will safeguard known resources from permanent development that would prevent their future working. No proposals to extract sandstone are currently active within the Development Site or Study Area.
- 11.5.20. The Forestry Access Track to A4061 Rhigos Road is partially within a safeguarding area for sandstone and coal within the NPTCBC area and for sandstone within the RCTCBC area. With regards to the Forestry Access Track located in RCTCBC and NPTCBC, there would be negligible impacts on safeguarding as any works required at worst would be minor road widening.
- 11.5.21. The Proposed Development is identified as the maximum extent of land potentially subject to the development for scoping purposes and the identification of land within its boundary does not necessarily mean that it will be developed upon.
- 11.5.22. The Mining Remediation Authority interactive map shows the Development Site is within a Coal Mining Reporting Area and Development High Risk Areas are present within the Site boundary. Multiple mineshafts are recorded within the Northern Array. Two mine shafts are recorded within 100m of the Southern Array.
- 11.5.23. Two Coal Authority Consultants Coal Mining Reports (CCMR) were obtained for the Northern and Southern Arrays, respectively, and are included as an Annex to the PRAs in **Appendix 11A**. A detailed review of available abandonment plans and the preparation of a site-specific Coal Mining Risk Assessment (CMRA) is being undertaken for the Northern and Southern Arrays to determine the significance of these features and to assess the need for intrusive investigation and/or remedial measures. The completed CMRAs will be included in the Final ES and the baseline will be updated accordingly.
- 11.5.24. The Forestry Access Track is also in a former coal mining area and the existing track intersects some Development High Risk Areas. Further consideration will be given to coal mining features along the Forestry Access Track for the Final ES. This may include

preparation of a CMRA for all sections of the track of limited sections of the track where development in the form of track improvement or widening may be needed.

## Desk study - Soils

11.5.25. Information reviewed on the LandIS Soils map<sup>25</sup> indicates the following soil types are present across the Development Site:

- Gelligaer (0654c); loamy permeable upland soils over sandstone with a wet peaty surface horizon and bleached subsurface horizon. Some soils with thin ironpan. Rock and scree locally. Peat to Loam texture, surface wetness.
- Withnell 1 (0611d); well drained loamy soils over sandstone usually on steep slopes. Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Bare rock locally. Loam texture, freely draining.
- Crowdy 2 (1013); Thick very acid amorphous raw peat soils. Perennially wet. Hagged and eroded in places, located centrally and towards the northern areas of the Forestry Access Track. Blanket peat texture, naturally wet.
- Wilcocks 1 (0721c); comprising slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey upland soils with a peaty surface horizon. Coarse loamy soils affected by groundwater in places. Very acid where not limed. Seasonally wet deep peat to loam, impeded drainage.

11.5.26. Percentage coverage and location of the above-mentioned soils is included in **Table 11.9**.

**Table 11.9 Soil Type Coverage**

| Area of Proposed Development | Soil Association Name | Approximate coverage of area | Location                                  |
|------------------------------|-----------------------|------------------------------|-------------------------------------------|
| Northern Array               | Gelligaer (0654c)     | 95%                          | Site wide.                                |
|                              | Withnell 1 (0611d)    | 4%                           | Northwest corner.                         |
|                              | Wilcocks 1            | 1%                           | Northern boundary.                        |
| Southern Array               | Gelligaer (0654c)     | 58%                          | Eastern and western areas.                |
|                              | Withnell 1 (0611d)    | 40%                          | Central and southern areas.               |
|                              | Wilcocks 1            | 2%                           | Southern boundary.                        |
| Forestry access track        | Gelligaer (0654c)     | 75%                          | South to central, localised in the north. |
|                              | Crowdy 2              | 20%                          | Central to northern areas.                |
|                              | Wilcocks 1            | 5%                           | Northern extent.                          |

11.5.27. Coverage of soils types across the Development Site are detailed in **Figure 11.4**.

11.5.28. The UK Soil Observatory dataset<sup>41</sup> provides information on the soil texture characteristics. Across the Proposed Development there are three dominant soil textures present:

- Northern Array: Approximately 85% 'loam to sandy loam'. Bands of 'clayey loam to sandy loam' in the northeast and northwest comprise approximately 15% of the area.

<sup>41</sup> UK Soil Observatory. UKSO (Online) Available at: UK Soil Observatory [Accessed July 2026]

- Southern Array: Approximately 90% 'loam to sandy loam', with bands of 'clayey loam to sandy loam' in the east, southwest and north of the area comprising 10% of the area.

11.5.29. At the Forestry Access Track, the textures are shown as follows from north to south:

- The northernmost extent of the access track, off Rhigos Road / A4061, where the track runs west, soil textures alternate between area of 'clayey loam to silty loam', 'clayey loam to sandy loam' and one area of 'peat'.
- As the track orientation changes to north south, large areas of 'peat' are present, with localised pockets of 'sand to sandy loam' and 'clayey loam to sandy loam'.
- Where the track reaches Upper Ogmere Windfarm and turns to the west / southwest towards the Northern and Southern Array, predominantly 'sand to sandy loam' soils are present, with occasional bands of 'clayey loam to sandy loam'.

## Agricultural Land Classification

11.5.30. Agricultural Land Classification (ALC) is used to define the condition and quality of land for agricultural use. Predictive mapping<sup>42</sup> of agricultural land classification for Wales shows agricultural land categorised into six categories:

- Grade 1 - excellent quality;
- Grade 2 – Very good quality;
- Grade 3a – Higher quality within grade 3;
- Grade 3b – Lower quality within grade 3;
- Grade 4 – poor quality; and
- Grade 5 - very poor quality.

11.5.31. Agricultural land of Grade 1 to 3a are characterised as the 'best and most versatile' agricultural land. Predictive ALC grades found within each area of the Proposed Development are detailed in **Table 11.10**. Further detail on the location of soils mapped across the Development Site is included in **Figure 11.1**.

**Table 11.10 Predictive Agricultural Land Classification Grades**

| Area of Proposed Development | Agricultural Land Classification Grades                                                           |
|------------------------------|---------------------------------------------------------------------------------------------------|
| Northern Array               | Predominantly Grade 5, with localised areas of Grade 4.                                           |
| Southern Array               | Predominantly Grade 4, with localised areas of Grade 5.                                           |
| Forestry access track        | Predominantly non-agricultural land, with localised areas of Grade 5, and small areas of Grade 4. |

11.5.32. The Predictive Agricultural Land Classification (ALC) Map indicates that the Development Site does not pass through any areas of 'best and most versatile' (BMV) land.

<sup>42</sup> Welsh Government (2019). Predictive Agricultural Land Classification (ALC) Map 2. Available at: [https://datamap.gov.wales/maps/new?layer=inspire-wg:wq\\_predictive\\_alc2#/](https://datamap.gov.wales/maps/new?layer=inspire-wg:wq_predictive_alc2#/) [Accessed July 2026].

## Peat Distribution

- 11.5.33. A review of the Peatlands of Wales mapping<sup>27</sup>, see **Figure 11.5**, indicates very limited peat potential within the Development Site, with only isolated areas identified by the Peatland of Wales Evidence dataset. No areas of mapped deep peat occur within the Northern and Southern Arrays and there are no statutory or local designations relating to peat within the Development Site.
- 11.5.34. The Phase 1 Soil and Peat Survey Report is included in **Appendix 11B**, and the findings are summarised below.

## Field survey – soil and peat

- 11.5.35. Soil and peat baseline information is presented in **Appendix 11B: Phase 1 Soil and Peat Survey Report**. This report includes Phase 1 peat probing survey results from 188 peat probe measurements, comprised of 118 in the Northern Array and 70 in the Southern Array, with further information on peat and other soil resources, obtained by advancing 10 hand auger boreholes and from field observations of exposed soils (four exposed soil faces) and soil arisings at a mole hill.
- 11.5.36. The report identifies three areas where further survey is recommended to target possible peat. This is on the basis that although no peat has been confirmed that meets the NPAP definition, peaty soils have been found and there may be some localised peat present, which would be of high sensitivity according to **Table 11.13** in the assessment methodology, **Section 11.8**. Peaty soils are assigned a medium sensitivity according to **Table 11.13**.
- 11.5.37. The report notes that soils with different texture and structure vary in their land use capability, sensitivity and environmental / ecosystem services offered. Losses and degradation of soil and its services can be a consequence of disturbance as well as the machinery and soil handling practices applied. The use of survey information on soil resources to inform soil management planning is an embedded measure in **Table 11.20**.
- 11.5.38. Across the Northern and Southern Array, 188 probing locations (approximately on a 100 x 100m grid), 89 of which were at or within 50m of Proposed Development infrastructure locations, and 15 hand auger (Dutch auger) boreholes were completed. Hand auger boreholes were used to target areas where peat probing found soft deposits greater than 0.3m thickness.
- 11.5.39. The probing survey results confirmed soft deposits (peat or other soft soils) of less than 0.3 m thickness and an average thickness of approximately 0.16 m in 86.7% of probing locations. Within 50 m of proposed infrastructure, approximately 85% of surveyed locations also recorded shallow soils of less than 0.3 m depth.
- 11.5.40. Probed depths  $\geq 0.3\text{m}$  were localised and limited to 13 points within the Development Site. These locations were subject to subsequent coring during the Phase 1 probing survey, to verify potential presence of peat. Details of probe depths and soil coring for the Northern and Southern Array are included in **Figure 11.6** and **Figure 11.7**.
- 11.5.41. Field investigations identified two principal soil groups across the Development Site:
- predominately medium-textured mineral soils comprising silty clay, clayey silt and weathered sandstone derived materials; and

- localised peaty soils associated with flushes, depressions and wetter areas of ground.
- 11.5.42. Typical mineral soil profiles comprise shallow topsoil over firm silty clay or clayey silt subsoils, frequently underlain by weathered sandstone or siltstone at relatively shallow depth. Soil wetness was generally low, although wetter conditions were observed locally within topographic depressions and areas of flow convergence.
- 11.5.43. The 15 hand auger points confirmed peaty soils, defined as: mineral soil horizons of <0.4m thickness recorded as “very organic”, meaning organic matter is likely to constitute >20% of the soil’s dry mass, or, organic soils (peat) recorded at <0.3m thickness) in four positions (very organic subsoil – N4, topsoil N5, topsoil S2, peat in N3 (0.13m), N4 – topsoil 0.3 (0.28m) and medium, textured mineral soils (silty and/or sandy clay, or gravelly silt aka loam) in 11 positions.
- 11.5.44. Peat deposits meeting the assessment definition of peat ( $\geq 0.3$  m thickness) were not recorded. The maximum observed peat thickness was 0.28 m at point N4. Organic rich soils were restricted to isolated pockets associated with depressions, flushes and wetter ground conditions rather than forming extensive peat deposits or blanket peat habitats.
- 11.5.45. The three areas identified within the Development Site where peat or peaty soils may be present are shown in **Figure 11.6.** and comprise areas around Turbine T2, sections of track between T1 and T3 associated within low-gradient flow convergence and land surrounding Turbine T6. These areas have been identified to inform ongoing design development and future targeted surveys to confirm the nature, depth and lateral extent of peaty soils and any connected confirmed peat.

## Peat Stability

- 11.5.46. In regard to ground stability and peat deposits, the Phase 1 soil and peat survey found no peat deposits meeting the NPAP peat definition within the Northern Array or the Southern Array (see **Appendix 11B**). Peaty soils are localised and generally shallow in nature. Consequently, peat related ground instability risks are anticipated to be limited; however, the areas identified as having potential for peat or peaty soils will be subject to further investigation during subsequent phases of site characterisation and design development.
- 11.5.47. A Peat Landslip Hazard Risk Assessments (PLHRA) has not been completed as part of the assessment based on the **Appendix 11B: Phase 1 Soil and Peat Survey Report** not confirming peat. However, the need for this will be reviewed following further survey works prior to the Final ES.

## Land contamination

### Northern Array

- 11.5.48. Most of the Proposed Development has remained as rough pasture vegetation, mainly for livestock grazing as evidenced by the presence of a sheepfold. The north-west corner of the Northern Array has been subject to coal mining activities, with pits, coal levels and a tramway being present.

- 11.5.49. Areas to the north-west, west, south-west, south and south-east of the Northern Array have been subject to mining activities, as evidenced by the presence of shafts, quarries and tramway routes.
- 11.5.50. A PRA has been undertaken for the Northern Array and is included as **Appendix 11A**. This presents the preliminary conceptual model for the Northern Array and an environmental risk assessment.
- 11.5.51. Several potential contamination sources have been identified within the Northern Array, these comprise:
- Made Ground associated with residual coal mining waste;
  - Made Ground associated with potentially infilled quarries / pits / ground workings and dismantled tramway;
  - Dismantled Tramway – railway land associated with former colliery;
  - Mine gas (associated with coal seams and recorded or unrecorded mine entries); and
  - Offsite, contaminated groundwater associated with potentially infilled quarries / pits / ground workings / dismantled tramway / residual coal mining, mine gas and agricultural / pastoral use.
- 11.5.52. Contamination associated with the dismantled tramway will be localised to the northwestern spur of the Northern Array. Made ground is likely to be located to the northwest, west and southwest where coal mining activities have taken place. Mine workings have the potential to be site wide. Shafts and adits are present in the Northern Array and adits are present in the Southern Array.
- 11.5.53. Contamination associated with agricultural / pastoral use has the potential to be site wide but is likely to be either small-scale and localised or diffuse and at low concentrations.
- 11.5.54. Potential receptors identified within the Study Area are detailed in **Table 11.11**.

## Southern Array

- 11.5.55. The majority of the Southern Array has remained rough pasture since the earliest available historical mapping. Coal mining activity was present on-site, localised to the south of the Southern Array between the peaks of Mynydd Moelgeila and Moel Cynhordy, centred on the West Rhondda Colliery. In this area, a dismantled tramway and quarry features were noted. The Southern Array was subdivided into field parcels from the 1962 mapping onwards, assumed to be for pastoral grazing, as indicated by the sheepfold recorded in the south-east of the array area.
- 11.5.56. A PRA has been undertaken for the Southern Array and is included as **Appendix 11A**. This presents the preliminary conceptual model for the Southern Array and an environmental risk assessment.
- 11.5.57. Several potential contamination sources have been identified within the Southern Array, these comprise:
- Made ground associated with former colliery;
  - Unspecified Heaps of presumed Colliery Spoil/Made Ground;
  - Tramway – railway land associated with former colliery;

- Adit, Shafts and Workings associated with former colliery;
- Agricultural / pastoral use; and
- Offsite, Made Ground associated with off-site colliery works, heaps, adits / workings / heaps and agricultural / pastoral use.

- 11.5.58. Contamination associated with colliery activities and the tramway is likely to be located in the southern areas of the site. However; adits / shafts and workings have the potential to be site wide but are most likely to present in the south and east of the Southern Array.
- 11.5.59. Contamination associated with agricultural / pastoral use has the potential to be site wide.
- 11.5.60. Potential receptors identified within the Study Area are detailed in **Table 11.11**.

## 11.6 Future baseline

- 11.6.1. In the absence of the Proposed Development, the current agricultural land use (mainly sheep grazing, and some limited crop growing) is likely to continue at the Development Site.
- 11.6.2. With respect to land contamination, this is managed in Wales by Part 2A of the Environmental Protection Act 1990. Part 2A requires county councils to identify potentially contaminated land in their area and ensure potential risks from historical contamination are assessed and mitigated accordingly. For future developments, The Town and Country Planning Act 1990 requires the consideration of the potential for contamination to be present and ensure a site is suitable for the proposed end use.
- 11.6.3. Climate change due to continued emission of greenhouse gases is ongoing globally and will likely result in further rises in the earth's temperature and long-lasting changes in the climate, such as increased frequency and duration of heatwaves and more intense rainfall. In Wales, as in the rest of the UK, the climate is already variable, however it is expected that there will be more intense rainfall, more flooding in low-lying coastal areas and hotter, drier summers, also more extremely warm days, milder and wetter winters, less snowfall and frost as well as lower groundwater levels.
- 11.6.4. For the Development Site, the potential effects of climate change are expected to relate to greater variation in river flows (low flows and high flows) with associated flooding during high flow, and the effects on soils and agricultural land of longer dry spells. Consideration of the flood risk at the Site is detailed in **Chapter 10: Water Environment**. Lack of water availability could limit crop production (which is recorded as taking place at the site), and the BGS state that soil characteristics such as "soil chemistry, erosion, saturation and regeneration could all be affected by climate change"<sup>43</sup>. As the Development Site is in agricultural use the land and soil is already managed to an extent, and as such, there is scope for alternative management approaches to both mitigate negative effects and promote positive effects of climate change.
- 11.6.5. The effects on soils (soil health and soil functions) are overall likely to be negative rather than positive; however, it is not possible to quantify these at present given the lack of

<sup>43</sup> BGS (2025) Soil and agriculture: BGS Climate Change Products. Available at: <https://www.bgs.ac.uk/about-bgs/services/climate-change-and-geohazards/sector-profiles-soil/>. Accessed 7 November 2025.

baseline information on soil health regionally and lack of models to predict the likely changes on a regional basis.

- 11.6.6. Climate change effects will interact with land contamination, potentially resulting in new contaminant migration pathways and distribution of contaminants. However, given the Development Site's elevated position, the surrounding land uses, and the localised or diffuse nature of the identified potential contamination sources, significant changes to the Site's land contamination status as a result of climate change are not likely to occur.
- 11.6.7. Therefore, it is reasonable to conclude that in the absence of the Proposed Development there would not be a significant change in Ground Conditions relating to land contamination, or significant change with regard to the condition of the soil / the agricultural land quality status, within the Study Area, up to and within the period of operation.
- 11.6.8. In regard to land stability, which may be affected by climate change, **Table 11.20** includes an embedded measure that the design of the Proposed Development will account for the expected Ground Conditions and design loads, accounting for the effects of climate change.

## 11.7 Scope of the assessment

### The Proposed Development

- 11.7.1. This section sets out the scope of the assessment for Ground Conditions, specifically in relation to geology (and geodiversity), minerals, soils (including peat) and land contamination. This scope has been developed as the design of the Proposed Development has evolved, and in accordance with the scoping responses to date as set out in **Section 11.3**.

### Spatial Scope

- 11.7.2. The spatial scope of the assessment of Ground Conditions covers the area of the Proposed Development contained within the red line boundary (the 'Development Site'), together with the Study Area, as described in **Section 11.4**.
- 11.7.3. The extent of the study area used to assess Ground Conditions is considered appropriate based upon professional experience. The assessment of impacts on soils has taken into consideration the potential for permanent loss of soils and soil function, through compaction and erosion of soils throughout construction, operation and decommissioning. For the assessment of effects on land contamination receptors, this includes consideration of the conceptual site model in relation to the potential for contaminants to migrate from the Development Site to offsite receptors on or through the soil or in groundwater, or to migrate onto the Development Site through soil or in groundwater from offsite sources. The conceptual site model has been developed in the PRAs, which form **Appendix 11A** using the information sources listed in **Table 11.5**.

## Temporal Scope

- 11.7.4. The temporal scope of the assessment of Ground Conditions is consistent with the period over which the Proposed Development would be carried out and therefore covers the construction (approximately 22 months), operational (30 years) and decommissioning (approximately 6 months) periods.
- 11.7.5. In relation to effects on soils and agricultural land, the highest potential for significant effects applies to the construction of the Proposed Development. Consideration is also given in the assessment to potential effects on soils during the operation and maintenance and decommissioning phases.
- 11.7.6. Further details of the programme for the Proposed Development are provided in **Chapter 4: Development Description**.

## Potential Receptors

- 11.7.7. The principal Ground Conditions receptors that have been identified as being potentially subject to effects are summarised in **Table 11.11**.

**Table 11.11 Ground Conditions receptors subject to potential effects**

| Receptor                                                                                                                | Reason for consideration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soil resources                                                                                                          | <p>Soil resources within the Development Site are in land mainly in agricultural use. There is no BMV agricultural land within the Study Area, and the land is at best ALC Grade 4 (poor quality agricultural land). However, the soils support grazing of sheep, and some limited crop growing.</p> <p>There is potential for peat on the Development Site. Phase 1 Peat survey on the Northern Array and Southern Array has not found peat &gt;0.3m thickness, and the survey indicates that soils present are predominantly mineral soils. However, localised peaty soils are present and potentially peat meeting the definition in <b>Section 11.2</b>.</p> <p>SINCs are present within the Northern and Southern Arrays and the soils within both areas have also been identified as supporting wildflower-rich habitat important for pollinators.</p> <p>Key soil functions on the land include supporting livestock grazing and crop growth, storage of organic carbon, providing habitat and supporting terrestrial biodiversity and a role in the hydrological cycle.</p> |
| <b>Land contamination receptors</b>                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Humans – current and future site users (agricultural workers, maintenance workers/ operatives, public open space users) | Potential for human health impacts to these receptors has been identified in the PRAs due to land contamination. Effects could occur either during construction, operation, or decommissioning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Humans – ground workers                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Receptor                                                                                                                                                                                                                                                                                                           | Reason for consideration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Controlled waters:<br>Groundwater – Secondary A aquifer                                                                                                                                                                                                                                                            | Groundwater has been identified as a potential receptor in the PRAs. Effects on the water environment due to land contamination could occur either during construction, operation, or decommissioning.                                                                                                                                                                                                                                                                                                                                          |
| Controlled water: Surface water – several watercourses noted in Northern Array. Surface drains, underground drain, river Nant Cedfyw' / 'Cwm Cedfyw'. Lake/reservoir in Southern Array.                                                                                                                            | Surface water has been identified as a potential receptor in the PRAs. Effects on the water environment due to land contamination could occur either during construction, operation, or decommissioning.                                                                                                                                                                                                                                                                                                                                        |
| Property: Future buildings and services<br>Property: Agricultural property (livestock, crops)                                                                                                                                                                                                                      | <p>Potential for impacts on the built environment (future wind farm development) due to land contamination have been identified in the PRAs.</p> <p>Agricultural property (livestock and limited crops) is present and identified as a potential receptor in the PRAs.</p> <p>Potential for impacts on the built environment (future wind farm development) due to land instability have been identified in the PRAs and Coal Mining Risk Assessment.</p> <p>Effects could occur either during construction, operation, or decommissioning.</p> |
| <p>* Note: Land contamination receptors include: Human health: future site users and adjacent site users (by direct contact, inhalation or ingestion pathways), controlled waters: groundwater and surface water, property (crops, grazing animals, built environment including services), and soil resources.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## Likely significant effects

- 11.7.8. The effects on Ground Conditions receptors which have the potential to be significant and have been scoped in are summarised in **Table 11.12**.

**Table 11.12 Summary of effects scoped in for the Ground Conditions assessment**

| Receptors                                                     | Effect                                                                                                     | Justification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Construction</b>                                           |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Soils (including peat, peaty soil &amp; mineral soils)</b> | Permanent loss of soil and associated soil functions due to construction of the wind farm and access route | The construction of permanent infrastructure has the potential to result in the irreversible removal, burial, displacement or sealing of soil resources. Soils, including peat, due to their extremely slow formation rates, are recognised as finite and effectively non-renewable natural resources, are recognised as finite and effectively non-renewable natural resources, and Welsh Government policy identifies soils as providing a range of valuable functions and ecosystem services, including biomass production, carbon storage, biodiversity support, regulation of water flow and quality, and climate regulation. |

| Receptors                                                     | Effect                                                                                                                                        | Justification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                               |                                                                                                                                               | <p>Permanent loss of soils can lead to the permanent loss or reduction of one or more soil functions within the affected footprint.</p> <p>Planning Policy Wales identifies peatland and the natural resources that underpin it as irreplaceable habitat and requires application of the Step-Wise Approach to avoid and minimise adverse effects on sensitive environmental resources. Consultation responses from NRW and LQAS emphasise the need to identify, assess and appropriately manage peat, peat-forming soils and wider soil resources through survey work, soil management planning and application of the mitigation hierarchy.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Soils (including peat, peaty soil &amp; mineral soils)</b> | Compaction of soil by vehicles or during soil stockpiling/ handling leading to damage to soil structure and damage to/loss of soil functions. | <p>Construction activities associated with the Proposed Development have the potential to result in soil compaction through vehicle movements, vegetation stripping, excavation, soil handling, storage, placement and reinstatement activities. Soil compaction is recognised by Welsh Government as a significant threat to soil resources and can adversely affect soil structure, reduce permeability and water infiltration, impair rooting depth, and damage soil biological function. Loss or degradation of soil structure can reduce the ability of soil to deliver important ecosystem services and soil functions, including biomass production, carbon storage, biodiversity support, climate regulation and regulation of water movement. The IEMA Guide (2022): <i>A New Perspective on Land and Soil in Environmental Impact Assessment</i> identifies soil health, soil functions and ecosystem services as important environmental receptors requiring consideration within the EIA process. Consultation responses from LQAS also require consideration of how soils and their functions will be conserved during construction through the preparation of a Soil Management Plan. The effect is therefore scoped into the assessment.</p> |
| <b>Soils (including peat, peaty soil &amp; mineral soils)</b> | Erosion of soil due to vegetation stripping, or soil handling and storage, leading to loss of organic matter in runoff                        | <p>Construction activities can expose soil through vegetation clearance, stripping, excavation and temporary storage, increasing susceptibility of exposed soils to erosion by wind and water. Soil erosion is recognised by Welsh Government as a key threat to soil resources and can result in the loss of soil material, soil organic matter and associated nutrients. The loss of organic matter may adversely affect soil health, carbon storage capacity, biodiversity support functions and regulation of water quality and water flow. Soil erosion can also reduce the long-term capability of soils to perform important ecosystem services and may contribute to the transfer of sediment and</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Receptors                                                                                                                                         | Effect                                                                                                                                                                        | Justification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                   |                                                                                                                                                                               | organic material to adjacent receiving environments. The IEMA land and soils guidance (2022) recognises the need to assess effects on soil resources and soil functions within EIA, whilst LQAS consultation responses specifically request consideration of how soil resources and their functions will be protected during construction activities. Accordingly, the potential for soil erosion and associated loss of soil function is scoped into the assessment.                                                                                                                                                                                                                                                                                                         |
| <b>Land contamination receptors (various)</b>                                                                                                     | Mobilisation of contaminants during construction activities                                                                                                                   | Mobilisation of contaminants due to ground disturbance or vegetation stripping e.g., dust generation, contaminated run-off, creation of new pollutant migration pathways during excavation, storage, or construction, failure to manage and segregate excavated materials appropriately, leaks or spills from plant or vehicles.                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Operation</b>                                                                                                                                  |                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Land contamination receptors: humans (site users), buildings</b>                                                                               | Accumulation of mine gas within enclosed spaces leading to potentially toxic and/or explosive atmospheres in enclosed spaces during operation.                                | New enclosed structures will be built for the Proposed Development, and the site has been identified as having a risk of mine gas being present.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Land Contamination receptors: human health – site users, water environment – groundwater and surface water, services and built environment</b> | Exposure to land contamination via numerous pathways (e.g., inhalation, direct contact, ingestion) resulting in health effects for site users, or impacts on other receptors. | <p>Potential for land contamination arising from spills or leakages of oils, or releases of other contaminants to ground during operation (including maintenance). These possible impacts are considered in Chapter 10 Water Environment.</p> <p>Potential mobilisation of contaminants due to ground disturbance during excavation e.g., dust generation, contaminated run-off, creation of new contaminant migration pathways, failure to manage and segregate excavated materials/ wastes appropriately.</p> <p>Consultees noted the potential for pollution from microplastics and PFAS (Per- and polyfluoroalkyl substances) as these can occur in various parts of wind turbines and could then be released due to the environment through wear and tear or damage.</p> |

## Effects to be scoped out

11.7.9. The effects that are to be scoped out of the Ground Conditions assessment are:

- Potential effects on geology, due to the absence of sensitive geological receptors on the Proposed Development site or in the study area. Geology is typical of the wider area with no designated sites of geological interest or mineral safeguarding areas located where they could be impacted by the Proposed Development. Potential

impacts on geology (bedrock and superficial geology) are therefore scoped out from further assessment.

- Potential effects on best and most versatile agricultural land, due to the Predictive Agricultural Land Classification (ALC) Map 2 showing the absence of any land above Grade 4. On the basis of the scoping responses, this Development Site does not require further assessment for ALC, and agricultural land has therefore been scoped out from further assessment. Effects on soil resources are considered in the assessment in **Sections 11.11 to 11.13**.
- Potential Impacts on Soils and Peat, including disturbance and compaction of Peat, peaty soils and mineral soils during operation as all vehicle movements will be constrained to access tracks.
- Potential effects on land quality during the construction phase due to accidental release of contaminants (including oils, fuels, chemicals and waste) from construction plant or machinery or waste storage points e.g., accidental spillages or leaks. These risks can be adequately managed through the Construction Environmental Management Plan (CEMP), and significant effects are, therefore, unlikely. Impacts resulting from accidental pollution on water resources have been considered in **Chapter 10: Water Environment**.
- Potential effects on construction workers (specifically ground workers), on the basis that risks to these workers will be dealt with under the Health and Safety at Work Act (1974) and regulations made under the Act. This would include desk study and site-specific contamination data obtained from site investigations being included in pre-construction information (this is a requirement of the Construction Design and Management Regulations 2015) for proposed ground disturbance works, enabling any contractors to address potential risks from contamination, as necessary, in their risk assessments and method statements. Using this approach, personal protective equipment (PPE) should always be the last line of defence, with methods selected that avoid or minimise risks to site workers.
- Potential effects on the built environment or other receptors due to ground instability, on the basis that these risks will be managed appropriately throughout the project by compliance with good practice in structural design including compliance with the Eurocodes and relevant British Standards is an embedded measure. CMRAs are ongoing for the Proposed Development and will be included with the Final ES. These will include recommendations as necessary for further assessment, including ground investigation. This will be undertaken prior to construction of the Proposed Development. The PRAs will be updated accordingly for the Final ES following completion of the CMRAs. Further assessment of peat within the Development Site and study area will be undertaken for the Final ES and if it is needed, this will include peat landslide hazard risk assessment (PLHRA).
- Potential effects on mineral resources are scoped out on the basis that although the Northern Array and the Southern Array are within Category 1 Aggregates Safeguarding Areas, this safeguarding area applies to approximately 50% of the land in Bridgend County Borough and there are no active quarries within the study area that could potentially be impacted by the development.

## 11.8 Assessment methodology

### Overview

- 11.8.1. The generic project-wide approach to the assessment methodology is set out in **Chapter 2: Approach to Environmental Impact Assessment**. However, whilst this has informed the approach that has been used in this Ground Conditions assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this Ground Conditions assessment.
- 11.8.2. The soil assessment is in general accordance with the 2022 IEMA Land and Soils guidance, as set out in the Scoping Report.
- 11.8.3. For land contamination receptors, the assessment methodology applied within this Draft ES chapter for land contamination differs from that outlined at Scoping, this brings the assessment in line with Design Manual for Roads and Bridges (DMRB) Sustainability & Environmental Appraisal, LA 109 Geology and Soils guidance and the change has been made to simplify the overall assessment process.

### Soil resources

- 11.8.4. The criteria for assigning sensitivity to soil resources within the Development Site is presented in **Table 11.13**.

**Table 11.13 Sensitivity classifications for soil resources (including peat)**

| Sensitivity | Description Example                                                                                                                                                                                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very high   | Soils (other than peat) directly supporting an EU designated site (e.g., SAC, SPA, Ramsar). Ancient Woodland.<br>Designated peatlands (any statutory designation including SSSI), other confirmed blanket bog, raised bog, fen peat.<br>Soils in Grade 1 and 2 agricultural land (and Subgrade 3a in Wales) according to the Agricultural Land Classification (ALC) system |
| High        | Soils (except peat – see above) supporting a designated site protected under national legislation, such as SSSI<br>Peat: peat $\geq$ 0.3 m thickness                                                                                                                                                                                                                       |
| Medium      | Soils (other than peat) supporting non-statutory designated sites (e.g., Local Nature Reserves (LNR), RIGS, Sites of Importance for Nature Conservation (SINCs)<br>Peaty soils e.g., peaty soils with topsoil containing peat $<0.3$ m thickness (or very organic mineral soils $<0.4$ m thickness)<br>Soils in Grade 3b agricultural land according to the ALC system     |
| Low         | Soils (other than peat) supporting non-designated notable or priority habitats<br>Soils in Grade 4 and 5 agricultural land according to the ALC system                                                                                                                                                                                                                     |

11.8.5. The magnitude of impact criteria are defined in Table 11.14.

**Table 11.14 Magnitude of change classifications for soil resources (including peat)**

| Magnitude  | Description of impacts                                                                                                                                                                                                                                                                                                                                                                                         |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Major      | Permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading), over an area of more than 20ha.<br>or<br>Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of more than 20ha.                                                                             |
| Moderate   | Permanent, irreversible loss of one or more soil functions or soil volumes, over an area of between 5 and 20ha.<br>or<br>Potential for improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of between 5 and 20ha.                                                                                                                                         |
| Minor      | Permanent, irreversible loss over less than 5ha or a temporary, reversible loss of one or more soil functions or soil volumes.<br>or<br>Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of less than 5 ha or a temporary improvement in one or more soil functions due to remediation or restoration or off-site improvement. |
| Negligible | No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.                                                                                                                                                                                                                                                                                  |

## Determination of significance

11.8.6. The matrix used to evaluate the significance of potential effects on soil receptors based on the receptor Sensitivity compared to the impact (effect) magnitude, is as shown in **Table 11.15**, effects anticipated to be significant are in dark grey shaded cells. Effects that may be significant are in light grey shaded cells, as noted below the table.

**Table 11.15 Soil effects significance evaluation matrix\***

|                                    |           | Magnitude of change |                   |                    |                     |                     |
|------------------------------------|-----------|---------------------|-------------------|--------------------|---------------------|---------------------|
|                                    |           | No change           | Negligible        | Minor              | Moderate            | High                |
| Sensitivity of receptor / resource | Very high | Neutral             | Slight            | Moderate or large  | Large or very large | Very large          |
|                                    | High      | Neutral             | Slight            | Slight or moderate | Moderate or large   | Large or very large |
|                                    | Medium    | Neutral             | Neutral or slight | Slight             | Moderate            | Moderate or large   |
|                                    | Low       | Neutral             | Neutral or slight | Neutral or slight  | Slight              | Slight or moderate  |
|                                    | Very low  | Neutral             | Slight            | Neutral or slight  | Neutral or slight   | Slight              |

\*Note: The dark grey shaded cells are those that are considered to be significant in EIA terms, i.e., those impacts assessed as 'moderate', 'moderate or large', 'large or very large' or 'very large', are considered significant. 'Slight or moderate' effects in the light grey shaded cells are potentially significant and will be assessed using professional judgement and experience to determine whether they are considered to be significant in EIA terms.

## Land contamination

- 11.8.7. Assessment of receptor value (sensitivity) for land contamination receptors follows the procedure described in **Table 11.16** which is based on the DMRB Sustainability & Environmental Appraisal, LA 109 Geology and Soils<sup>44</sup> (Table 3.11) (Highways England, 2019). Negligible value/sensitivity has been removed, as it is deemed irrelevant as no receptor (in terms of Ground Conditions) is classed as negligible. The attributes associated with geodiversity and soils have also been removed as the approach to assessment of effects on these is detailed above.
- 11.8.8. Factors that may affect the sensitivity of likely receptors of land contamination impacts include:
- Human receptors: age, weight, sex, exposure duration and distance from a potential source of contamination.
  - Water environment receptors: distance from the potential source of contamination and resource potential.

<sup>44</sup> Highways England (2019), Design Manual for Roads and Bridges, LA 104 – Geology and Soils. Available at: <https://www.standardsforhighways.co.uk/search/adca4c7d-4037-4907-b633-76eae30b9c0> (Accessed June 2026).

**Table 11.16 Classification of Value or sensitivity (Land Contamination receptors)**

| Sensitivity | Attribute     | Criteria                                             | Typical Examples                                                                                                                                                                                                                                                                                                                                                         |
|-------------|---------------|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very high   | Contamination | Human health: very high sensitivity land use.        | Residential or allotments.                                                                                                                                                                                                                                                                                                                                               |
| Very high   | Groundwater   | Nationally significant attribute of high importance. | Principal aquifer providing a regionally important resource and / or supporting a site protected under: <ul style="list-style-type: none"> <li>■ European Commission (EC); and</li> <li>■ UK legislation Ecology and Nature Conservation</li> </ul> Groundwater locally supports groundwater dependent terrestrial ecosystem (GWDTE) or Source Protection Zones (SPZ) 1. |
| High        | Contamination | Human Health: high sensitivity land use.             | Public open space                                                                                                                                                                                                                                                                                                                                                        |
| High        | Groundwater   | Locally significant attribute of high importance.    | Principal aquifer providing locally important resource or supporting a river ecosystem                                                                                                                                                                                                                                                                                   |
| Medium      | Contamination | Human Health: medium sensitivity land use.           | Commercial or industrial land use                                                                                                                                                                                                                                                                                                                                        |
| Medium      | Groundwater   | Of moderate quality and rarity                       | Aquifer providing water for agricultural or industrial use with limited connection to surface water.<br>SPZ3.                                                                                                                                                                                                                                                            |
| Low         | Contamination | Low sensitivity land use                             | Highways, railway land                                                                                                                                                                                                                                                                                                                                                   |
| Low         | Groundwater   | Lower quality                                        | Unproductive strata.                                                                                                                                                                                                                                                                                                                                                     |

11.8.9. The expected magnitude of change to each identified attribute and receptor has been assigned in accordance with the principles established in DMRB LA 109 and DMRB LA 104<sup>45</sup> along with Competent Expert's professional judgement. In considering the magnitude of change, the following have been taken into account:

- The magnitude of the potential consequence (severity). Considering both the potential duration and severity of exposure to potential land contamination and the sensitivity of the receptor;

<sup>45</sup> Highways England (2020), Design Manual for Roads and Bridges, LA 104 - Environmental assessment and monitoring Revision 1. Available at: <https://www.standardsforhighways.co.uk/search/0f6e0b6a-d08e-4673-8691-cab564d4a60a> (Accessed June 2026).

- The magnitude of probability (likelihood). considering both the presence of potential land contamination and receptor and the potential for a pathway to be realised between them; and
- Embedded mitigation which, by design, reduces the severity or likelihood of exposure to potential land contamination.

11.8.10. The terms used to describe magnitude of change are defined in Table 11.17.

**Table 11.17 Classification of Magnitude of Change (Land Contamination receptors)**

| Magnitude of change |            | Definition                                                                                                                                                                                              |
|---------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No change           |            | No loss or alteration of characteristics, features or elements; no observable impact for better or worse.                                                                                               |
| Negligible          | Adverse    | Very minor loss or detrimental alteration to one or more characteristics, features or elements.                                                                                                         |
|                     | Beneficial | Very minor benefit to or positive addition of one or more characteristics, features or elements.                                                                                                        |
| Minor               | Adverse    | Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.                                            |
|                     | Beneficial | Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduce risk of negative impact occurring.                        |
| Moderate            | Adverse    | Loss of resource but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements; short-term exposure to contaminants with chronic (long-term) toxicity. |
|                     | Beneficial | Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.                                                                                                |
| Major               | Adverse    | Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements; exposure to acutely toxic contaminants.                                          |
|                     | Beneficial | Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.                                                                     |

11.8.11. Once the sensitivity of the affected receptor / receiving environment to change and the magnitude of change have been established, the matrix presented in **Table 11.18**, will be used to determine the significance of effect ranging from 'negligible' to 'major'.

**Table 11.18 Significance evaluation matrix (Land Contamination receptors)**

|                             |                  | Magnitude of change                |                                    |                                    |                              |                              |
|-----------------------------|------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------|------------------------------|
|                             |                  | Major                              | Moderate                           | Minor                              | Negligible                   | No Change                    |
| <b>Sensitivity of value</b> | <b>Very high</b> | Major (significant)                | Major (significant)                | Moderate (potentially significant) | Minor (not significant)      | Negligible (not significant) |
|                             | <b>High</b>      | Major (significant)                | Moderate (potentially significant) | Minor (not significant)            | Minor (not significant)      | Negligible (not significant) |
|                             | <b>Medium</b>    | Moderate (potentially significant) | Minor (not significant)            | Minor (not significant)            | Negligible (not significant) | Negligible (not significant) |
|                             | <b>Low</b>       | Minor (not significant)            | Minor (not significant)            | Negligible (not significant)       | Negligible (not significant) | Negligible (not significant) |

11.8.12. The definitions used in assessing significance of effect are presented in **Table 11.19**.

**Table 11.19 Key to significance evaluation matrix (Land Contamination receptors)**

| Significance Category of effect | Typical Definition                                                                                                                      |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Major                           | Effects at this level are likely to be material in the decision-making process.                                                         |
| Moderate                        | Effects at this level can be considered to be material decision-making factors.                                                         |
| Minor                           | Effects at this level are not material in the decision-making process.                                                                  |
| Negligible                      | No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error. |

## 11.9 Maximum design scenario

- 11.9.1. The assessments in this chapter for Ground Conditions, including soils and land contamination receptors, is based on the maximum design scenario to establish the potential maximum (worst-case) impact on ground condition receptors. The construction of the Proposed Development will ultimately result in the temporary and permanent disturbance of soils. The nature of disturbance and associated footprints of elements of the Project are summarised below.

### Permanent development on soils

- 11.9.2. The total area of permanent hard development for the Northern and Southern Arrays, based on the maximum design scenario is 6.38 ha, and the worst-case permanent hard development area for the Forestry Access Track sections that connect the Northern and Southern Array is 4.14 ha, giving a total of 10.52 ha, as detailed below.

### Northern Array

- 11.9.3. The Northern Array will require approximately 2.1km of new access tracks. Works will include vegetation clearance and excavations. The access tracks will be approximately 5.0m wide and will have a 2.0m wide grassed verge on either side. Tracks will be approximately 0.6m deep (ground conditions dependent). The total area associated with new access track for the Northern Array is estimated at 1.05 ha, with 0.84ha for access track verges. Soil will be disturbed / removed to construct the verges, and it is likely that most will be reused within the verge. Taking a cautionary approach, the assessment assumes a worst-case figure of **1.89ha** of permanent soil loss associated with access tracks within the Northern Array.
- 11.9.4. Each turbine will require a transformer; in some instances, this can be incorporated into the base of the tower itself; however, for a worst-case assessment it is assumed that an external kiosk is needed to house the transformer, with a maximum area of 5.0m x 2.5m (12.5m<sup>2</sup>) per turbine, and a total area of **0.005ha** within the Northern Array.
- 11.9.5. Up to four wind turbines will each require foundations, likely to be formed by a reinforced concrete slab base approximately 20m in diameter. Each wind turbine requires an adjacent area of hardstanding for use as a crane pad, and these will be left in place during the operational phase for use during maintenance / replacement of parts. They could also be used during decommissioning. Each crane pad and turbine platform together will require approximately 0.22ha (2,200m<sup>2</sup>); the maximum total area of the four crane pads will therefore be **0.88ha** within the Northern Array.
- 11.9.6. The Proposed Development requires an internal substation in the Northern Array to connect the wind farm into the national distribution system. This may require a transformer within the substation compound within a stoned area of approximately 37.5m x 35m. The substation building will be a single storey building, approximately 14m x 10m, housing metering, protection and control equipment, storage and welfare facilities. To provide a worst-case assessment it is therefore assumed that the substation building, and transformer compound will require a total area of **0.145ha**.

- 11.9.7. The substation welfare facilities will include a water supply system which is likely to be rainwater fed, no connection to mains water supply is proposed; an area for this element has not been provided at this stage.

## Southern Array

- 11.9.8. The Southern Array will require approximately 2.7km of new internal access tracks. Works will include vegetation clearance, excavations, and widening of existing tracks. The access tracks will be approximately 5.0m wide and will have a 2.0m wide grassed verge on either side. Tracks will be approximately 0.6m deep (ground conditions dependent). It is assumed that new verges will be needed for existing tracks being widened. The total area of new track within the Southern Array will therefore require an area of 1.35ha and 1.08ha for the verges for the new track. Soil will be disturbed / removed to construct the verges, and it is likely that most will be reused within the verge. Taking a cautionary approach, the assessment assumes a worst-case figure of **2.43ha** of permanent soil loss associated with access tracks within the Southern Array.
- 11.9.9. Each turbine will require a transformer; in some instances, this can be incorporated into the base of the tower itself; however, for a worst-case assessment it is assumed that an external kiosk is needed to house the transformer, with a maximum area of 5.0m x 2.5m (12.5m<sup>2</sup>) per turbine, and a total area of **0.005ha** within the Southern Array.
- 11.9.10. Up to four wind turbines will each require foundations, likely to be formed by a reinforced concrete slab base approximately 20m in diameter. Each wind turbine requires an adjacent area of hardstanding for use as a crane pad, and these will be left in place during the operational phase for use during maintenance / replacement of parts. They could also be used during decommissioning. Each crane pad and turbine platform together will require approximately 2,200m<sup>2</sup> in area; the maximum total area of the four crane pads will therefore be **0.88ha** within the Southern Array.
- 11.9.11. The Proposed Development requires an internal substation in the Southern Array to connect the wind farm into the national distribution system. This may require a transformer within a substation compound within a stoned area of approximately 37.5m x 35m. The substation building will be a single storey building, approximately 14m x 10m, housing metering, protection and control equipment, storage and welfare facilities. To provide a worst-case assessment it is therefore assumed that the substation building, and transformer compound will require a total area of **0.145ha**.

## Forestry Access Track (between Northern and Southern Arrays)

- 11.9.12. A total length of 4.6km is estimated for Forestry Access Track sections that connect the Northern and Southern Array. Works would include widening of existing track sections, excavations, and vegetation clearance. The proposed access tracks will be approximately 5.0m wide and will have a 2.0m wide grassed verge on either side. Tracks will be approximately 0.6m deep (ground conditions dependent). For upgrades to existing tracks an additional width has been added for verge establishment. The total track area (including road widening) for the Forestry Access Track sections connecting the Northern and Southern Array has been estimated to be 2.30ha, with additional 1.84ha for verge

establishment. Under a worst-case scenario, a total of **4.14ha** would be associated with soil removal for widening of existing roads. This is a worst case as most of the track between the Northern and Southern Arrays will be located along the route of an existing track. For the assessment in the Draft ES, only impacts on soils have been considered for this section of track, due to a lack of available baseline data for land contamination.

- 11.9.13. Whilst upgrades to the remaining sections of the Forestry Access Track from Rhigos Road to the Northern Array will likely be required, this has not been assessed at this stage due to a lack of available design information. This will be assessed prior to final ES submission.

## Temporary development on soils

- 11.9.14. The temporary removal of soil is associated with development areas for which soils can be stockpiled and reinstated on completion of construction in the same locations as they were excavated.

## Northern Array

- 11.9.15. For each turbine an area of temporary hardstanding is reserved for blade storage, tower storage and blade laydown areas, which amounts to  $\sim 1,500\text{m}^2$  per turbine location. Across the Northern Array the total area reserved for this element would be  **$\sim 0.6\text{ha}$** .
- 11.9.16. Underground cables will link the turbines within the Northern Array to an on-site substation situated within each parcel. Temporary ground disturbance will be required to install the underground cables running between the turbines and the substation, this will require up to 5m width either side of the cable trench. The cables will be placed in cable trenches approximately 0.45m wide and 0.75m deep; To minimise ground disturbance, cables will be routed alongside the proposed access tracks. **Figure 4.6** shows a typical cable trench detail. For the purposes of the assessment, a maximum width has been applied for the cable trench at ground surface of 1.5m. The length of the cable is not known, therefore, the length of the new and widened access track of 2.1km has been used as a likely total given the turbine layout (based on 11.5m wide working corridor), given a total cable trench area of **2.415ha**.
- 11.9.17. Temporary use of land will be required for a construction compound requiring an area of around 50 x 50m (**0.25ha**). Once the erection and commissioning of the wind turbines is complete, the compounds would be removed, and the surface reinstated during the construction phase.
- 11.9.18. A temporary site office will be needed; this will be located within the above temporary compounds. Temporary buildings will not have connection to mains water supply or any below ground water pipes, associated footprint have not been assessed.

## Southern Array

- 11.9.19. For each turbine, an area of temporary hardstanding is reserved for blade storage, tower storage and blade laydown areas, which amounts to  $\sim 1,500\text{m}^2$  per turbine location. Across the Southern Array the total area reserved for this element would be  **$\sim 0.6\text{ha}$** .

- 11.9.20. Underground cables will link the turbines within the Southern Array to an on-site substation situated within each parcel. Detailed construction and trenching specifications will depend on the Ground Conditions encountered at the time, but typically cables will be laid in a trench 750mm deep and 450mm wide. To minimise ground disturbance, cables will be routed alongside the proposed access tracks. **Figure 4.6** shows a typical cable trench detail. Temporary ground disturbance will be required to install the underground cables running between the turbines and the substation, this will require up to 5m width either side of the cable trench. The cables will be placed in cable trenches approximately 0.45m wide and 0.75m deep; however, for the purposes of the assessment, a maximum width has been applied for the cable trench at ground surface of 1.5m. The length of the cable is not known, therefore, the length of the new and widened access track of 2.7km has been used as a likely total given the turbine layout (based on 11.5m wide working corridor), given a total cable trench area of **3.105ha**.
- 11.9.21. Temporary use of land will be required for a construction compound requiring an area of around 50 x 50m (**0.25ha**). Once the erection and commissioning of the wind turbines is complete, the compounds would be removed, and the surface reinstated during the construction phase.
- 11.9.22. A temporary site office will be needed; this will be located within the above temporary compounds. Temporary buildings will not have connection to mains water supply or any below ground water pipes; associated footprint have not been assessed.

## Maximum impact area on soils

- 11.9.23. With information to date, the approximate area of land and soil that would be associated with permanent displacement or soil sealing because of the Proposed Development is estimated at **10.52ha**, with **2.92ha** within the Northern Array, **3.46ha** within the Southern Array, and **4.14ha** within the section of the Forestry Access Track between the array areas.
- 11.9.24. With information to date, the approximate area of soil that would be associated with temporarily displaced or reversible impacts because of the Proposed Development would be approximately **7.22ha**, with **3.265ha** within the Northern Array and **3.955ha** within the Southern Array.

## Development on peat

- 11.9.25. As discussed in **Section 11.5**, Phase 1 soil and peat survey results evidenced the presence of localised peaty soils and the potential for peat within both Northern and Southern Array as illustrated in **Figure 11.7** (shown on a precautionary basis, with reference to **Table 11.13** as high sensitivity soils).
- 11.9.26. Permanent disturbance across areas of potential high sensitivity soils (the “Zones of Interest” identified in **Section 11.5** are applied for identified areas with peaty soils on the basis that if peat was later found, the surrounding soils would need to be protected and sensitivity would increase to high for peat areas (and potentially surrounding peaty soils if linked). Permanent disturbance is expected for 1.29km of new access tracks located within the Northern Array, and discernible disturbance within the Southern Array, resulting in a total disturbance area of 1.16ha. In addition, a total of 0.44ha hardstanding

associated with the crane pad and turbine foundation of T2 and T3 is considered. Total land area associated with permanent high sensitivity peat loss is estimated to be **1.17ha**.

- 11.9.27. Temporary disturbance or reversible impact across areas of high sensitivity soils is expected for 1.29km of underground cabling within the Northern Array, resulting in a total of 1.50ha. This would also involve the temporary storage areas for T2 and T3, resulting in a combined temporary footprint of 0.3ha. The construction compound within the Northern Array is also sited partly in an area with potential for high sensitivity soils, covering an area of 0.55ha. Total land area associated with temporary high sensitivity peat loss is estimated to be **2.35ha**.
- 11.9.28. Soil and peat survey has not yet been completed for the Forestry Access Track due to lack of design information. As noted in **Section 11.16**, the need for additional survey will be considered at the next stage of assessment and baseline updated as needed for the assessment in the Final ES. However, some design information is available for the section of track between the Northern and Southern Arrays and a worst-case assessment has been included in the assessment of effects on soils due to permanent development based on available information for this section of track. In the absence of survey information, available baseline soil information for the Forestry Access Track between the Northern and Southern Arrays is as follows: BGS do not identify peat, the Peatlands of Wales Evidence Map shows no peat, and the National Soil Map shows Gelligaer soils (peat to loam over sandstone). The ALC grade for this area is 4 or 5, or non-agricultural land. There are no nature conservation designations or Ancient Woodland along this track section. Additionally, much of the track already exists, indicating that soils are likely to be compacted, and/or covered by stone. On this basis, the soils are assessed to be of low sensitivity, however this will be reviewed for the assessment in the Final ES once more baseline information is available.

## Development on other soils

- 11.9.29. The remaining soils within the Northern and Southern Arrays are located in land assigned ALC grades 4 and 5 which is poor or very poor agricultural land, and soil resources in this land would be assigned low sensitivity according to **Table 11.13**.

## Mitigatory factors under maximum design scenario

- 11.9.30. Disturbance of soil cannot be entirely avoided by the Proposed Development and, as a living resource, soil is inherently vulnerable to damage during stripping, handling, storage and reinstatement activities, even where disturbance is considered temporary. Some soil types are less resilient to disturbance than others due to their physical and chemical characteristics. However, the impact assessment is based on a conservative maximum design scenario that identifies the maximum potential footprint of infrastructure prior to detailed micro-siting and final design optimisation.
- 11.9.31. In accordance with the Planning Policy Wales Step-wise Approach, the Applicant will continue to seek opportunities to avoid sensitive soil resources where practicable and, where avoidance is not possible, to minimise impacts through the development and application of effective soil management principles informed by additional site characterisation and design refinement with micro-siting. Embedded mitigation in **Table**

**11.20** includes that where the Proposed Development cannot avoid soils, areas with soils of lower sensitivity will be preferred to areas with high or medium sensitivity soils.

- 11.9.32. This process will be used to reduce the extent of disturbance to soil resources and to support the maintenance of soil functions wherever practicable.
- 11.9.33. Where soils are handled appropriately and reinstated in accordance with best practice and as soon as reasonably practicable, their functional characteristics are expected to recover over time. For the purposes of this assessment, soil sensitivity is assessed primarily on the basis of soil function rather than solely on structural characteristics. However, due consideration of soil texture and wetness, both of which affect soils susceptibility to damage during construction works, will be given in soil management planning. Development of an Outline Soil Management Plan (Outline SMP) is an embedded measure for the Proposed Development and this will set out soil handling measures tailored to the soil types present.
- 11.9.34. Soil type and soil structure influence the sensitivity of soils to handling, storage and placement. Soil resilience to structural degradation depends on the interaction between soil texture and soil moisture content at the time of handling. To inform the Outline SMP, further soil resource surveys, including but not limited to investigation of areas of high sensitivity soil will be undertaken for the Proposed Development. The investigation findings will be used to update the baseline and assessment in the Final ES and to inform the Outline SMP, which will also form part of the Final ES.
- 11.9.35. These measures will support the application of the Step-wise Approach by helping to avoid, reduce and manage impacts on sensitive soils, including localised areas of peat (upon discovery), through careful infrastructure siting, minimisation of construction footprints, appropriate soil handling techniques and restoration measures. Differences in soil sensitivity and handling requirements will therefore be addressed through the embedded measures set out in **Table 11.20** and incorporated into the final design of the Proposed Development.

## 11.10 Embedded measures

- 11.10.1. A range of environmental measures have been embedded into the Proposed Development as outlined in **Chapter 4**. A summary of the embedded environmental measures is included in **Table 11.20**.

**Table 11.20 Summary of embedded environmental measures**

| Receptor              | Potential changes and effects*                                                                                                                | Embedded measures                                                                                                                                                                                                                                                                                               | Compliance mechanism                                                                                                                                        |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Soil resources</b> | Compaction of soil by vehicles or during soil stockpiling/ handling leading to damage to soil structure and damage to/loss of soil functions. | A soil resources survey will be completed by a soil scientist / experienced soil specialist for the Northern Array, Southern Array and sections of Forestry Access Track that require upgrades prior to construction. The findings of the soil resources survey will be used to inform the Outline SMP and Soil | Outline SMP, this may form part of a Materials Management Plan (MMP) or a Site Waste Management Plan (SWMP), and Construction Environmental Management Plan |

| Receptor | Potential changes and effects* | Embedded measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Compliance mechanism                    |
|----------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
|          |                                | <p>Resources Plan (which may be part of a Materials Management Plan, MMP, or a Site Waste Management Plan, SWMP).</p> <p>A peat survey may be needed for the proposed Forestry access track, this will provide information on the soils present and the findings of the survey will be used inform soil handling during construction.</p> <p>Excavated topsoil will be stored separately from excavated subsoil. Soil will be reinstated in reverse order to replace the original soil profile in the original order.</p> <p>Storage and handling of soil will be informed by the Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites to avoid damage to soil structure and help to minimise soil compaction, and associated measures will be detailed in the Outline SMP. The Outline SMP will be submitted to the local authority for comment prior to construction.</p> <p>If Ground Conditions require it, a temporary trackway of either metal, wood, or plastic, would be used for vehicles to access the working areas. This would be removed once construction is complete.</p> <p>During topsoil stripping, machinery with low ground pressure will be used to minimise soil compaction, including during construction of the access tracks, the tracks will then be available for heavier vehicles to use to avoid impacts on other areas.</p> <p>Temporary storage of soils will be carried out in accordance with the Outline CEMP. This document will outline where excavated non-waste materials will be reused. If peat cannot be avoided, then a Peat Management Plan (PMP) will be developed for the Proposed</p> | <p>(CEMP) secured via DNS condition</p> |

| Receptor       | Potential changes and effects*                                                                                         | Embedded measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Compliance mechanism                                                                  |
|----------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                |                                                                                                                        | <p>Development and appended to the CEMP.</p> <p>Vegetation stripping will be carried out on an as-needed basis to minimise the period of time that bare soils are left exposed.</p> <p>Storage of excavated soils intended for reuse will be kept local to the point of excavation wherever possible, to avoid mixing of soil types. Soils will be reinstated at the earliest opportunity to avoid long-term (e.g., &gt; six months) soil storage.</p>                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |
| Soil resources | Erosion of soil due to vegetation stripping, or soil handling and storage, leading to loss of organic matter in runoff | <p>A soil resources survey will be completed for the Northern Array, Southern Array and sections of Forestry Access Track that require upgrades by a soil scientist / experienced soil specialist prior to construction and the findings of the soil resources survey will be used to inform the Outline SMP for soil handling and measures to minimise soil erosion from exposed (stripped) soils or stockpiled soils.</p> <p>Measures to avoid soil compaction (which can result in soil erosion by increasing surface run-off) are integrated into the Outline CEMP to avoid damage to soil.</p> <p>The CEMP will detail how temporary storage of soils is to be managed.</p> <p>Soil stockpiles will be stored for the shortest amount of time possible.</p> <p>If peat cannot be avoided, then a Peat Management Plan will be developed for the Proposed Development.</p> | Outline SMP and CEMP secured via DNS condition                                        |
| Soil resources | Permanent loss of soil and associated soil functions due to construction of the wind farm and access route             | <p>Where the Proposed Development cannot avoid soils, areas with soils of lower sensitivity will be preferred to soils with the highest sensitivity (e.g., by design refinement and micro-siting).</p> <p>The footprint of the permanent hard development will be kept to that required for the safe</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Outline SMP, this may form part of an MMP or SWMP, and CEMP secured via DNS condition |

| Receptor | Potential changes and effects* | Embedded measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Compliance mechanism |
|----------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|          |                                | <p>construction and operation of the wind farm and associated infrastructure.</p> <p>Storage and handling of soil will be informed by the Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites to avoid damage to soil structure. This measure included in the Outline CEMP (<b>Appendix 4A</b>) will be updated following the proposed peat and soil survey (in support of the Final ES).</p> <p>Permanently displaced soil will be reused within the Site where practicable in accordance with the CEMP and/or MMP or SWMP. The measures contained in the Outline CEMP (<b>Appendix 4A</b>) will be updated in support of the Final ES.</p> <p>A soil resources survey will be completed for the wind farm development site by a soil scientist / experienced soil specialist prior to construction and the findings of the soil resources survey will be used to inform the Outline SMP for soil handling and storage, which will allow excavated soil that is surplus to the Proposed Development to be retained in good condition and potentially reused offsite (in accordance with the MMP or SWMP).</p> <p>Where it is identified through soil resource and materials management planning that topsoil or subsoil cannot be reinstated at its original location, sampling and testing of excavated topsoil and subsoil will be completed in accordance with BS:3882:2015 and BS:8601:2013, respectively, at the earliest opportunity, to inform the reuse of these soils elsewhere within the Proposed Development or at a suitable offsite receptor site.</p> <p>Peat depth survey has been completed for the Northern &amp; Southern Array Site and has</p> |                      |

| Receptor                               | Potential changes and effects*                                                                                                                                                                                                                                                                               | Embedded measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Compliance mechanism                                    |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
|                                        |                                                                                                                                                                                                                                                                                                              | confirmed the absence of peat. Phase 2 Peat survey will be completed for sections of the access track to collect data on where peat is present along the route. This data will inform detailed design, to enable the Proposed Development to avoid peat where possible and will inform the assessment in the Final ES. If peat cannot be avoided, then a Peat Management Plan will be developed for the Proposed Development.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |
| Land contamination receptors (various) | Mobilisation of contaminants due to ground disturbance e.g., dust generation, contaminated run-off, creation of new pollutant migration pathways during excavation or construction, failure to manage and segregate excavated materials appropriately, resulting in effects on land contamination receptors. | <p>A PRA study has been completed for the Proposed Development (Appendix 11A) for the Northern and Southern Arrays. The need for a PRA to cover all or part of the Forestry Access Track will be considered during the next stage of the assessment and included in the Final ES as needed to update the baseline and inform the assessment.</p> <p>Phase 2 intrusive geo-environmental ground investigation will be completed during the pre-construction phase, including soil sampling and chemical testing, to confirm the Ground Conditions.</p> <p>Potential risks to human health from any known, suspected or unexpected ground contamination will be avoided by adopting appropriate working methods and all aspects of construction will be completed in compliance with the Construction (Design and Management) Regulations 2015, CAR 2012 and the Health and Safety at Work Act (1974) and regulations made under the Act. These legal obligations include the requirement for risk assessments and method statements for all construction related activities and the use of appropriate working methods, training and Personal Protective Equipment (PPE).</p> | CEMP, to include MMP or SWMP, secured via DNS condition |

| Receptor                                                    | Potential changes and effects*                                                                                                             | Embedded measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Compliance mechanism            |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
|                                                             |                                                                                                                                            | <p>Temporary storage of excavated materials will be in accordance with the MMP or SWMP.</p> <p>Contamination if found will be subject to appropriate risk assessment and if necessary, either removed, treated and/or mitigated as part of the Proposed Development. The CEMP will include an unexpected contamination protocol (Appendix 4A).</p> <p>Best practice air quality management measures will be applied as described in Institute of Air Quality Management (IAQM) (2014) guidance on the Assessment of Dust from Demolition and Construction 2024, version 2.2<sup>46</sup>.</p>                                      |                                 |
| Contaminated land receptors: humans (site users), buildings | Accumulation of mine gas within enclosed spaces leading to potentially toxic and/or explosive atmospheres in enclosed spaces.              | In accordance with LCRM, PRAs have been completed for the Northern & Southern Array, and the report is appended to the Draft ES (Appendix 11A). Further investigation or remediation will also be undertaken in accordance with LCRM.                                                                                                                                                                                                                                                                                                                                                                                              | CEMP and DNS planning condition |
| Built environment (buildings, structures, services)         | Aggressive or unstable Ground Conditions with potential to cause damage to buildings/structures due to ground movement or chemical attack. | Coal Mining Risk Assessments (CMRAs) will be completed for the Site prior to the Final ES and will include recommendations to address potential ground instability risks associated with former deep coal mining and possible unrecorded shallow mine workings. The CMRAs will ensure that land stability issues are understood and adequately addressed in the design, and that appropriate measures, such as intrusive investigation, are considered or completed during the pre-construction phase, as recommended in the CMRA, i.e., boreholes and trial pits. Remediation may subsequently be needed. The potential intrusive | DNS planning condition          |

<sup>46</sup> Institute of Air Quality Management, Assessment of Dust from demolition and construction (2024). Available at: [Construction-Dust-Guidance-Jan-2024.pdf](#) (Accessed July 2026).

| Receptor                                                                                                                                                                                                                                                                                                                                                        | Potential changes and effects*                                                                                                                                     | Embedded measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Compliance mechanism           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                    | <p>investigations and any remediation work required based on the findings of these investigations will be communicated to the Mining Remediation Authority in advance of undertaking the works.</p> <p>Further peat investigation and assessment will be undertaken and as part of this work and the requirement for a PLHRA will be assessed.</p> <p>The basis of the structural design for the Proposed Development will be completed in general accordance with design standards to minimise the risk of future structural or geotechnical instability.</p>                                                                                                                                                                                                                                                                                            |                                |
| Land contamination receptors (various)                                                                                                                                                                                                                                                                                                                          | Unintended release of contaminants to the environment from materials used in the operational parts of the Proposed Development during operation or decommissioning | <p>Materials selected for the above and below ground wind farm equipment will be suitably resistant to weather and Ground Conditions and have sufficient anticipated lifespan to ensure that they are unlikely to significantly degrade during the operational phase.</p> <p>In the event that damage to above ground equipment is observed, appropriate action will be taken to investigate any potential impacts to ground (soils and groundwater) in accordance with LCRM.</p> <p>Underground electrical cables installed for the Proposed Development will not be oil-filled.</p> <p>Buried cables will be protected from damage/ deterioration by the use of sand/ soil cushioning to avoid them being in contact with sharp stones/ objects, and placement of marker tape above the cables will help to alert anyone digging to their presence.</p> | CEMP secured via DNS condition |
| <p>*Effects during operation and decommissioning are anticipated to be similar to those identified for the construction phase but smaller in scale, with the exception that during the operation and decommissioning phase no effects associated with permanent loss of soil resources are expected, as no additional permanent land take should be needed.</p> |                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                |

## 11.11 Assessment of effects – Construction Phase

- 11.11.1. As noted above, the assessment does not currently include the Forestry Access Track other than inclusion of the section of track between the Northern and Southern Arrays in regard to effects on soils from permanent hard development. As further design information becomes available, assessment of effects on soils along the entire Forestry Access Track will be completed and included in the final ES. Additional baseline data will be collected to inform this, as outlined in **Section 11.16**. The assessment below therefore relates to the Northern Array, including the Grid Connections, and the Southern Array except for assessment of permanent effects on soils which does include a section of the Forestry Access Track.

### Assessment of construction effects: soils

#### Permanent loss of soils and associated soil functions

- 11.11.2. The construction of permanent infrastructure associated with the Proposed Development will result in the permanent removal, displacement, burial and sealing of soil resources. As identified in **Table 11.12**, this will result in the permanent loss or reduction of soil functions.
- 11.11.3. The maximum area of potential permanent loss, displacement or sealing of soil associated with the Proposed Development is estimated to be **10.52ha**. This represents a conservative maximum design scenario prior to detailed micro-siting, design optimisation, and completion of further soil and peat survey work. Other mitigation measures in **Table 11.20** include implementation of the soil management hierarchy, development of an Outline SMP, intended to enable excavated soils that cannot be reinstated where they came from, to be handled and maintained in a condition where they can potentially be reused within the Proposed Development or offsite.
- 11.11.4. In accordance with the sensitivity criteria in **Table 11.13**, soils within the Northern and Southern Arrays are assessed as predominantly low sensitivity. Although the Phase 1 Soil and Peat Survey identified no peat meeting NPAP criteria (see **Section 11.2**) within the Northern Array and Southern Array, localised areas of peaty soils have been identified and their potential extent is shown on a precautionary basis on **Figure 11.7**, as areas of possible high sensitivity soils. If no peat is confirmed during further survey in these areas, peaty soils alone would meet the criteria for medium sensitivity in **Table 11.13** but for the purposes of the assessment, high sensitivity has been applied. Possible high sensitivity soils are estimated to occur in **1.17ha** where permanent hard development could be located within the identified “Zones of Interest” described in **Section 11.5**. There is a SINC partly within the Southern Array, soils within this area would be assigned medium sensitivity according to **Table 11.13**, however permanent development for the Proposed Development will avoid this area.
- 11.11.5. With the mitigation measures, it is expected that the potential high sensitivity soils can be largely avoided by permanent development features of the Proposed Development and therefore based on low soil sensitivity, and applying the magnitude criteria in **Table 11.14**, a moderate magnitude of impact is assessed, resulting in a **slight adverse effect**, which is **not significant** in EIA terms.

- 11.11.6. This conclusion should be revisited for the Final ES following completion of further peat and soil survey work.

## Compaction of soils

- 11.11.7. Construction activities associated with the Proposed Development have the potential to increase the susceptibility of soils to erosion through vegetation removal, excavation, soil handling and temporary storage. As identified in **Table 11.12**, erosion of soils can result in the loss of soil material, organic matter and associated nutrients, leading to adverse effects on soil health and a reduction in soil functions, including carbon sequestration, biomass production, biodiversity support and hydrological regulation.
- 11.11.8. In accordance with the sensitivity criteria in **Table 11.13**, soils within the Northern and Southern Arrays are assessed as predominantly low sensitivity. Although the Phase 1 Soil and Peat Survey identified no peat meeting NPAP criteria (see **Section 11.2**) within the Northern Array and Southern Array, localised areas of peaty soils have been identified and their potential extent is shown on a precautionary basis on **Figure 11.7**, as areas of possible high sensitivity soils. If no peat is confirmed during further survey in these areas, peaty soils alone would meet the criteria for medium sensitivity in **Table 11.13** but for the purposes of the assessment, high sensitivity has been applied. There is a SINC partly within the Southern Array, soils within this area would be assigned medium sensitivity according to **Table 11.13**, however temporary development for the Proposed Development will avoid this area.
- 11.11.9. Under the maximum design scenario, construction activities would lead to temporary disturbance of approximately **7.22ha** of soil (of which an estimated 2.35ha could be located high sensitivity soils) associated with cable installation, temporary compounds, and other temporary construction working areas. Additional areas of soil would also be subject to vehicle trafficking and construction activities during infrastructure installation. These activities have the potential to result in localised degradation of soil structure and temporary impairment of soil functions if not appropriately managed.
- 11.11.10. Embedded mitigation measures to limit impacts on soils include:
- completion of a site-specific Outline SMP informed by the available soil and peat resource survey information and further survey to be completed prior to the Final ES;
  - separate storage of excavated topsoils and subsoils and the implementation of soil handling measures based on the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites;
  - planning the construction works to minimise periods when soils are exposed either due to vegetation stripping or where they are temporarily stored in stockpiles;
  - use of low ground pressure machinery where appropriate;
  - provision of temporary trackway where required by ground conditions; and
  - control of soil stripping, stockpiling, storage and reinstatement through the Construction Environmental Management Plan (CEMP) and an associated Materials Management Plan (MMP) or Site Waste Management Plan (SWMP).
- 11.11.11. Where peat cannot be avoided, additional measures including preparation of a Peat Management Plan (PMP) would be implemented.

- 11.11.12. These measures would substantially reduce the likelihood and extent of adverse effects on soil structure by minimising unnecessary trafficking of exposed soils, restricting handling activities during unsuitable ground conditions where practicable, and ensuring that disturbed soils are stored and reinstated in accordance with recognised good practice. As a result, the magnitude of change is assessed as Minor.
- 11.11.13. Applying the significance matrix presented in **Table 11.15** with implementation of the embedded mitigation measures, for low sensitivity soils and a minor magnitude of change for compaction of soil (based on a temporary, reversible loss of one or more soil functions over <5 ha) this results in a **neutral or slight adverse effect** which is not significant in EIA terms. If high sensitivity soils are found in further surveys, based on a minor magnitude of change this would result in a **slight to moderate adverse effect** which is considered to be not significant in EIA terms.
- 11.11.14. This conclusion will be reviewed for the Final ES following completion of additional soil and peat surveys and further design refinement.

## Erosion of soils

- 11.11.15. Construction activities associated with the Proposed Development have the potential to increase the susceptibility of soils to erosion through vegetation removal, excavation, soil handling and temporary storage. As identified in **Table 11.12**, erosion of soils can result in the loss of soil material, organic matter and associated nutrients, leading to adverse effects on soil health as well as impacts on surface water quality due to silt-laden or nutrient-rich runoff.
- 11.11.16. Baseline information presented in **Section 11.5** indicates that soil resources across the Proposed Development comprise a range of soil types, including predominantly shallow medium-textured mineral soils, localised peaty soils associated with flushes, depressions and wetter ground conditions. There are areas with the potential for peat to be present within identified “Zones of Interest” on the Northern and Southern Arrays and along sections of the Forestry Access Track. National soil mapping also identifies Gelligaer, Withnell, Wilcocks and Crowdy soil associations within the Development Site, reflecting a transition from freely draining mineral soils to wetter peaty and peat-forming soils in more localised areas. These soil types exhibit differing susceptibility to erosion as a consequence of variations in texture, organic matter content, drainage characteristics and resilience to disturbance.
- 11.11.17. In accordance with the sensitivity criteria in **Table 11.13**, soils within the Northern and Southern Arrays are assessed as predominantly low sensitivity. Although the Phase 1 Soil and Peat Survey identified no peat meeting NPAP criteria (see **Section 11.2**) within the Northern Array and Southern Array, localised areas of peaty soils have been identified and their potential extent is shown on a precautionary basis on **Figure 11.7**, as areas of possible high sensitivity soils. If no peat is confirmed during further survey in these areas, peaty soils alone would meet the criteria for medium sensitivity in **Table 11.13** but for the purposes of the assessment, high sensitivity has been applied. There is a SINC partly within the Southern Array, soils within this area would be assigned medium sensitivity according to **Table 11.13**, however temporary development for the Proposed Development will avoid this area.

- 11.11.18. Under the maximum design scenario, construction activities would lead to temporary disturbance of approximately **7.22ha** of soil (of which an estimated 2.35ha could be located high sensitivity soils) associated with cable installation, temporary compounds, and other temporary construction working areas. Additional areas of soil would also be subject to vehicle trafficking and construction activities during infrastructure installation. These activities have the potential to result in localised degradation of soil structure which can result in increased likelihood of erosion.
- 11.11.19. Embedded mitigation measures to limit impacts on soils include:
- completion of a site-specific Outline SMP informed by the available soil and peat resource survey information and further survey to be completed prior to the Final ES;
  - implementation of soil handling measures based on the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites;
  - planning the construction works to minimise periods when soils are exposed either due to vegetation stripping or where they are temporarily stored in stockpiles;
  - use of low ground pressure machinery where appropriate to avoid soil compaction and subsequent erosion;
  - provision of temporary trackway where required by ground conditions; and
  - control of soil stripping, stockpiling, storage and reinstatement through the Construction Environmental Management Plan (CEMP) and an associated Materials Management Plan (MMP) or Site Waste Management Plan (SWMP).
- 11.11.20. Where peat cannot be avoided, additional measures including preparation of a Peat Management Plan (PMP) would be implemented.
- 11.11.21. These measures would substantially reduce the likelihood and extent of soil erosion by minimising unnecessary trafficking of exposed soils, minimising soil compaction, undertaking phased vegetation clearance as needed to avoid leaving soil exposed, ensuring that soil stockpiles are stored for the shortest amount of time possible, restricting soil handling activities during unsuitable climatic or ground conditions whenever practicable, and ensuring that disturbed soils are stored and reinstated in accordance with recognised good practice and at the earliest opportunity. As a result, the magnitude of change is assessed as **minor**.
- 11.11.22. Applying the significance matrix presented in **Table 11.15** with implementation of the embedded mitigation measures, for low sensitivity soils and a minor magnitude of change for compaction of soil (based on a temporary, reversible loss of one or more soil functions over <5 ha) this results in a **neutral or slight to adverse effect** which is not significant in EIA terms. If high sensitivity soils are found in further surveys, and cannot be avoided, based on a minor magnitude of change this could result in a **slight or moderate adverse effect**. This is considered to be not significant in EIA terms given the localised nature of the receptor and uncertainty over its presence.
- 11.11.23. This conclusion should be revisited for the Final ES following completion of further peat and soil survey work.

## Assessment of construction effects - Land contamination

### Mobilisation of contaminants during construction activities

- 11.11.24. The receptor sensitivity on the Proposed Development Site is medium for human health, based on commercial use of the future windfarm and continuation of agricultural use (see **Table 11.16**). The water environment sensitivity is considered to be high based on a secondary bedrock aquifer and the presence of surface watercourses onsite. The sensitivity of the future buildings and services on the Proposed Development Site is considered to be low given the nature of the Proposed Development.
- 11.11.25. Based on the findings of the PRAs (**Appendix 11A**), there are localised potential sources of contamination on the Development Site, mainly associated with historical mining activity. This means that it is likely that the Proposed Development can be constructed in a manner that avoids disturbance to localised areas of soil or groundwater contamination. Additional measures are also in place as follows.
- 11.11.26. As outlined in the embedded measures set out in **Table 11.20**, phased assessment of land contamination risks will be carried out in accordance with LCRM (Environment Agency, 2025)<sup>47</sup>. A ground investigation will be undertaken during pre-construction and soil samples collected for laboratory testing, including an environmental testing suite. If groundwater is encountered and is within possible excavation depths for the Proposed Development, this will also be sampled and submitted for laboratory testing for relevant contaminants. The environmental risk assessment in the PRAs (**Appendix 11A**) will be updated during pre construction using the data from the ground investigation.
- 11.11.27. During construction, materials management planning will be undertaken to avoid cross contamination of excavated material, and temporary storage of soils or other excavated materials will be in accordance with the MMP or SWMP, with appropriate segregation, and containment to prevent contaminated run-off reaching the ground. Unexpected contamination, if found during construction, will be subject to appropriate risk assessment and if necessary, either removed or treated as part of the Proposed Development.
- 11.11.28. As the Proposed Development can potentially avoid land contamination, remediation is unlikely to be needed, and negligible beneficial effects would therefore be expected. Based on the embedded measures above, the potential for construction of the Proposed Development to result in deterioration of soil or groundwater quality is also considered to be negligible.
- 11.11.29. In relation to conventional contaminants such as fuels and oils, relevant embedded environmental measures (**Table 11.20**) that will influence the magnitude of change by limiting the potential for uncontrolled releases of contaminants to ground from the above or below ground infrastructure during the operational phase of the Proposed Development. These relate to:
- the implementation of best practice for storage of potentially polluting substances or materials, set up of construction work (to ensure compliance with The Construction (Design and Management) Regulations 2015, and the Health and Safety at Work Act etc.1974);

<sup>47</sup> Environment Agency, Land Contamination Risk Management (2020). Available at: [LCRM: Before you start - GOV.UK](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/431111/LCRM_Before_you_start_-_GOV.UK.pdf) (Accessed Jult 2026).

- control of construction activities and drainage, including incident management; and
- compliance with legislation and guidance for pollution prevention, such as Pollution Prevention Guidance Notes (PPGs) and Guidance for Pollution Prevention Notes (GPPs) (both maintained by NetRegs and provide environmental good practice guidance for the UK, and environmental regulatory guidance directly to Northern Ireland, Scotland, and Wales only)<sup>30</sup>.

- 11.11.30. With the mitigation measures there should not be potential for an impact magnitude due to leaks, spills or other environmental incidents during construction that is greater than negligible.
- 11.11.31. Based on the presence of high sensitivity receptors and a negligible magnitude of impact, in accordance with Table 11.18, this results in an overall **Minor adverse effect** (not significant).

## 11.12 Assessment of Effects: Operation and maintenance

### Assessment of Operation Effects: Soils

#### Disturbance and Compaction of Soils (and Peat)

- 11.12.1. During the operation and maintenance phase (up to 30 years), physical soil disturbance and displacement is expected to be minimal, highly localised, and confined to routine inspection and minor repair activities. Access tracks will enable vehicles to avoid driving over exposed vegetation or exposed soils. No large-scale excavation of soil is anticipated, nor activities which would result in compaction. Any unplanned works would be subject to good practice mitigation associated with soil (and peat) management (as well as the management of other constraints) and are assumed to be implemented successfully.
- 11.12.2. Soils of medium sensitivity (SINC partly within the Southern Array) or possibly high sensitivity (this is not confirmed but there is potential for localised peat in the “Zones of Interest” identified in **Appendix 11B**, otherwise peaty soils in these areas would be assigned medium sensitivity) are considered unlikely to be adversely affected by the Proposed Development as permanent development and temporary development will be located to avoid SINC and peat and to avoid peaty soils where possible.
- 11.12.3. Therefore, operational and maintenance effects will be substantially less than those during construction and based on soils across most of the Northern and Southern Arrays being a **low sensitivity** receptor and a **minor adverse effect**, so are assumed to be **neutral or slight adverse effect (not significant)**. No additional mitigation is therefore required.

### Assessment of Operation Effects: Land Contamination

#### Human health impacts due to accumulation of mine gas

- 11.12.4. The Proposed Development will introduce new potential mine gas migration pathways and new receptors, including wind farm workers who may have to enter buildings/ enclosed spaces. Receptor sensitivity on the Proposed Development Site is medium for human

health, based on commercial use of the future windfarm and continuation of agricultural use (see **Table 11.16**). The Proposed Development will include some limited enclosed spaces e.g., within the substation and smaller spaces such as at the wind turbines.

- 11.12.5. The PRAs (**Appendix 11A**) produced in line with LCRM have identified a High risk to future site users in regard to mine gas, which is a higher risk than in the current scenario, as explained further below.
- 11.12.6. The current risk level to site users from mine gas is low, given there are no enclosed spaces currently on the Development Site and no recorded mine gas issues. The Proposed Development will introduce new enclosed spaces, although these will not be routinely occupied. In this scenario, the hazard has a medium consequence, due to potential for gas accumulation in enclosed spaces to result in asphyxiation or explosion/fire risk. The Proposed Development could introduce new gas migration pathways including along buried cable routes. With a likelihood of likely, the risk to future site users with the Proposed Development if no mitigation were to be applied would be High.
- 11.12.7. However, the embedded measures include a commitment to ensure that the land subject to construction will be suitable for the proposed future use in line with LCRM guidance (Environment Agency, 2025)<sup>45</sup> and the recommendations in the PRAs for the Northern & Southern Array (**Appendix 11A**), completed in line with LCRM, include undertaking a Detailed Mine Gas Risk Assessment in line with CL:AIRE 2021 guidance and monitoring for ground gas, which should be undertaken at the proposed turbine and substation locations. Consideration of the risks from ground gas (in particular, enclosed spaces where ground gas can accumulate) is therefore an embedded measure through compliance with LCRM and obtaining ground investigation data preconstruction to confirm the risk level from mine gas.
- 11.12.8. Based on the implementation of this mitigation, either the ground investigation data will demonstrate that the hazard from mine gas is absent at levels that could result in explosion or it will identify that a post development mine gas risk is present. In this instance, there may be a need for design change to avoid mine gas hazards and/ or physical gas protection mitigation measures will need to be incorporated into the design of structures.
- 11.12.9. Further assessment of former coal mining features is ongoing for the CMRAs for the Northern and Southern Arrays and the PRAs will be updated following completion of the CMRAs for the Northern and Southern Arrays. Due to uncertainty over whether the risk can be adequately controlled with the current design information, the assessment of effects relating to mine gas will be undertaken once further information is available and will be included in the Final ES.

### Potential releases of contaminants during maintenance, potential new contaminant migration pathways, potential releases from wind farm equipment

- 11.12.10. The receptor sensitivity on the Proposed Development Site is medium for human health, based on commercial use of the future windfarm and continuation of agricultural use (see **Table 11.16**). The water environment sensitivity is considered to be high based on a

secondary bedrock aquifer and the presence of surface watercourses onsite. The sensitivity of the future buildings and services on the Proposed Development Site is considered to be low given the nature of the Proposed Development.

- 11.12.11. By the operational phase, potential risks associated with land contamination would have already been controlled by ensuring that land required for the Proposed Development is suitable for the proposed use in line with LCRM. This includes the implementation of remediation, where required.
- 11.12.12. This will ensure that inappropriate reuse of materials that could generate a build-up of ground gas, or result in contaminated leachate is not likely.
- 11.12.13. During the operation phase, maintenance activities requiring excavation of soils would be undertaken following the risk assessment and management procedures as per construction work, including to avoid impacts to soils from possible leaks or spills (such as fuels or soil from vehicles), and an unexpected contamination protocol would be in place for excavations.
- 11.12.14. During operation, there is the potential for degradation of or damage to above and below ground wind farm infrastructure, which could result in the accidental release of hazardous chemicals to ground resulting in pollution of soils and groundwater (and potential impacts on surface water quality) including PFAS and microplastics. Wind turbine paints and coatings can contain PFAS, this is due to the desirable properties of PFAS which include heat resistance, water resistance, and anti-reflectiveness<sup>48</sup>. In normal operating conditions, there should be a very low potential for release of PFAS contaminants to the environment from the turbines due to wear and tear, given the expected lifespan of the wind turbine parts and components.
- 11.12.15. As outlined in **Chapter 4: Development Description**, there will be regular onsite maintenance of the turbines and high voltage equipment (substation) by technicians (typically at 6 monthly intervals). Technicians would also visit turbines to repair faults, identified through remote monitoring of the wind farm performance. At regular periods through the project life, oils and components will require changing which will increase the service time on site per machine. Gearbox oil changes are required approximately every 18 months. Blades would be inspected annually, either by drone or rope access.
- 11.12.16. In the unlikely event of damage to above ground wind farm equipment appropriate action will be taken to investigate any potential impacts to ground (soils and groundwater) in accordance with LCRM and Environmental Damage (Prevention and Remediation, Amendment Wales, 2015)<sup>49</sup> including, where appropriate, testing of soils and groundwater for contaminants including PFAS.
- 11.12.17. Other key mitigation measures include the commitment for the Proposed Development to comply with good practice in structural design including compliance with the Eurocodes and relevant British Standards (**Table 11.20**). The design will account for the expected Ground Conditions and design loads, accounting for the effects of climate change. Materials selected for the wind farm equipment and associated above and below ground infrastructure will be suitably resistant to weather and ground conditions and have

<sup>48</sup> UK Parliament (2025) UK Parliament POSTnote 747. (online) Available at:

<https://researchbriefings.files.parliament.uk/documents/POST-PN-0747/POST-PN-0747.pdf>. Accessed 27 July 2026

<sup>49</sup>The Environmental Damage (Prevention and Remediation) (Amendment) (Wales) Regulations 2015 Accessed 27 July 2026.

sufficient anticipated lifespan to ensure that they are unlikely to significantly degrade during the operational phase (**Table 11.20**).

- 11.12.18. Electrical transformers will be located within containers which will serve as bunds for oils used within the transformers, lowering the potential for a leakage of oil to reach the ground.
- 11.12.19. In relation to conventional contaminants such as fuels and oils, relevant embedded environmental measures (**Table 11.20**) that will influence the magnitude of change by limiting the potential for uncontrolled releases of contaminants to ground from the above or below ground infrastructure during the operational phase of the Proposed Development. These relate to:
  - the implementation of best practice for storage of potentially polluting substances or materials, set up of construction work (to ensure compliance with The Construction (Design and Management) Regulations 2015, and the Health and Safety at Work Act etc.1974);
  - control of construction activities and drainage, including incident management; and
  - compliance with legislation and guidance for pollution prevention, such as Pollution Prevention Guidance Notes (PPGs) and Guidance for Pollution Prevention Notes (GPPs) (both maintained by NetRegs and provide environmental good practice guidance for the UK, and environmental regulatory guidance directly to Northern Ireland, Scotland, and Wales only)<sup>30</sup>.
- 11.12.20. With the mitigation measures there should not be potential for an impact magnitude greater than negligible.
- 11.12.21. Based on the presence of high sensitivity receptors and a negligible magnitude of impact, in accordance with **Table 11.18**, this results in an overall **Minor adverse effect** (not significant).

## 11.13 Assessment of Effects: Decommissioning

- 11.13.1. During decommissioning of the Proposed Development, there are not anticipated to be any significant new earthworks, with the main activities associated with the removal of hardstandings, restoration of constructed drainage, and tracks were required.
- 11.13.2. It is anticipated that turbine foundations and other below-ground infrastructure would be removed to just below ground level and appropriately covered to facilitate natural regeneration. Complete removal of foundations solely on the basis of their anthropogenic origin is not considered necessary and would be contrary to sustainability principles, as it would require additional excavation and the import of soils to infill, resulting in unnecessary consumption of resources.
- 11.13.3. A Decommissioning Plan and programme will be prepared prior to construction and will be reviewed periodically throughout the operational phase to reflect current best practice, legislative requirements and advances in technology.
- 11.13.4. It is emphasised that associated impacts on Ground Conditions receptors are expected to be considerably less than those encountered during the construction phase (and therefore not significant in EIA terms).

## 11.14 Assessment of cumulative (inter-project) effects

- 11.14.1. A cumulative effects assessment (CEA) has been undertaken for the Proposed Development which considers the combined impacts with other developments on the same single receptor or resource (inter-project effects). The detailed method followed in identifying and assessing potential cumulative effects is set out in **Chapter 2**.
- 11.14.2. For the purposes of the cumulative assessment development within the 250m buffer study area for the Northern and Southern Arrays have been considered.
- 11.14.3. Likely impacts on soil receptors are limited to the permanent development areas within the Northern and Southern Arrays. There are no confirmed high sensitivity soil receptors present in the Northern or Southern Array, although some limited potential for localised peat to be present has been identified and further survey will be needed to investigate this. The soils impacted by the Proposed Development are mainly of Low sensitivity. No likely impacts in the wider study area (250m buffer) have been identified in relation to soil or land contamination receptors.
- 11.14.4. The Northern and Southern Arrays do not include any BMV agricultural land, which is to be protected according to national and regional planning policy.
- 11.14.5. Based on the above and given that there are currently no proposed developments within the 250m ZOI of the Northern or Southern Array, no potential for significant cumulative effects has been identified. This conclusion should be revisited for the Final ES following completion of further peat and soil survey work, and updating of the PRAs (**Appendix 11A**).
- 11.14.6. It should be noted that at this stage, only the Northern and Southern Arrays have been considered in regard to cumulative effects, as a PRA, associated walkovers and peat surveys are yet to be undertaken for the Forestry Access Track.
- 11.14.7. It is noted that the Forestry Access Track overlaps the footprint of a proposed windfarm redevelopment known as Upper Ogmores Wind Farm, which is being proposed by Renewable Energy Systems (RES). The details for the Upper Ogmores Wind Farm<sup>50</sup> indicate that the redevelopment will include 7 turbines, with associated substation, crane hardstanding, cabling and access tracks. The potential for cumulative effects to arise as a result of construction of the Forestry Access Track in conjunction with other developments will be considered in the Final ES once design information and necessary baseline information has been adequately updated.

## 11.15 Significance conclusions

- 11.15.1. A summary of the results of the Ground Conditions assessment is provided in **Table 11.21** and **Table 11.22**.

<sup>50</sup> Reference: DNS/3213662 - Upper Ogmores - Wind Turbines Developments of National Significance

**Table 11.21 Summary of significance of effects for Soil Resource**

| Receptor and summary of predicted effects                                                                                                                      | Sensitivity / importance / value of receptor <sup>1</sup> | Magnitude of change <sup>2</sup> | Significance <sup>3</sup>                                                                                       | Summary rationale                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction:                                                                                                                                                  |                                                           |                                  |                                                                                                                 |                                                                                                                                                                                  |
| Soil resources<br>Compaction of soil by vehicles or during soil stockpiling/ handling leading to damage to soil structure and damage to/loss of soil functions | Low to High                                               | Minor                            | Neutral or Slight adverse effect (Not significant)<br>Or<br>Slight or Moderate adverse effect (Not significant) | The assessment is based upon the area of soil to be disturbed and/or temporarily displaced, and the embedded environmental measures to limit and avoid soil compaction.          |
| Soil resources<br>Erosion of soil due to vegetation stripping, or soil handling and storage, leading to loss of organic matter in runoff                       | Low to High                                               | Minor                            | Neutral or Slight adverse effect (Not significant)<br>Or<br>Slight or Moderate adverse effect (Not significant) | The assessment is based upon the area of soil to be disturbed and/or temporarily displaced, and the embedded environmental measures to limit and avoid soil erosion.             |
| Soil resources                                                                                                                                                 | Low                                                       | Moderate                         | Slight adverse (Not significant)                                                                                | The assessment is based upon the area of soil to be permanently lost to hard development (i.e., soil sealing or soil removal, with most soil functions other than provision of a |

| Receptor and summary of predicted effects                                                                   | Sensitivity / importance / value of receptor <sup>1</sup> | Magnitude of change <sup>2</sup> | Significance <sup>3</sup>                             | Summary rationale                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Permanent loss of soil and associated soil functions due to construction of the wind farm and access tracks |                                                           |                                  |                                                       | <p>platform for buildings/ infrastructure being lost in the impacted area). The embedded measures include minimising the footprint required for the Proposed Development, applying the soil management hierarchy, favouring development on lower sensitivity soils wherever possible, and the assessment also considered the limited potential for high sensitivity soils to be present.</p> <p>The natural soil profiles and existing land use can largely be maintained around wind farm structures and tracks.</p> <p>This assessment will be revisited for the Final ES once additional soil and peat survey information is available.</p> |
| Operation:                                                                                                  | Low                                                       | Minor                            | Neutral or Slight adverse effect<br>(Not significant) | The assessment is based upon the area of soil to be disturbed and/or temporarily displaced, and the embedded environmental measures to limit and avoid soil compaction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in Section 1.8 and is defined as very low, low, medium, high and very high.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in Section 1.8 and is defined as very low, low, medium, high and very high.
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (potentially significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in Section 1.8.

**Table 11.22 Summary of significance of effects: land contamination receptors**

| Receptor and summary of predicted effects                                                            | Sensitivity / importance / value of receptor <sup>1</sup>                                                | Magnitude of change <sup>2</sup> | Significance <sup>3</sup>              | Summary rationale                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Construction:</b>                                                                                 |                                                                                                          |                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Mobilisation of contaminants during construction activities                                          | High (maximum sensitivity)                                                                               | Negligible                       | Minor adverse effect (Not significant) | Embedded measures include compliance with good practice for pollution prevention during the construction works and phased assessment of suspected or unexpected contamination in accordance with LCRM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Operation:</b>                                                                                    |                                                                                                          |                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Human health impacts due to accumulation of mine gas                                                 | Not currently assessed pending additional assessment in CMRAs and further consideration of mine gas risk |                                  |                                        | <p>Embedded measures include CMRAs, PRAs, and compliance with CL:AIRE coal mine gas risk guidance (CL:AIRE, 2021) and phased assessment of suspected or unexpected contamination in accordance with LCRM.to confirm the ground gas regime at the site so that ground gas sources can be characterised and ground gas hazards avoided and/ or suitable mitigation such as gas protection measures included in the design so that the risk to site users is reduced to low.</p> <p>CMRAs are ongoing at the time of writing the Draft ES, these will be used to update the PRAs including Detailed Mine Gas Risk Assessment, and the findings used to inform the assessment in the Final ES.</p> |
| Potential releases of contaminants during maintenance, potential new contaminant migration pathways, | High (maximum sensitivity)                                                                               | Negligible                       | Minor adverse effect (Not significant) | Embedded measures include phased assessment of suspected or unexpected contamination in accordance with LCRM. By the operational phase, potential risks associated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Receptor and summary of predicted effects   | Sensitivity / importance / value of receptor <sup>1</sup> | Magnitude of change <sup>2</sup> | Significance <sup>3</sup> | Summary rationale                                                                                                                                        |
|---------------------------------------------|-----------------------------------------------------------|----------------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| potential releases from wind farm equipment |                                                           |                                  |                           | with land contamination would have already been controlled by ensuring that land required for the Proposed Development is suitable for the proposed use. |

1. The approach to assessment of the significance is based on the change in the level of risk from the baseline condition, as a result of the Proposed Development, subject to the evaluation methodology outlined in **Section 11.8**.

## 11.16 Further work to be undertaken

- 11.16.1. Preparation of site-specific Coal Mining Risk Assessments (CMRAs) are ongoing to determine the significance of coal mining features identified with Northern and Southern Arrays to assess the need for intrusive investigation and/or remedial measures.
- 11.16.2. Site walkovers will be undertaken to assess coal mining features and potential contaminant sources across the Development Site to complete CMRAs and to update the PRAs (**Appendix 11A**) for the Final ES.
- 11.16.3. The need for a PRA and CMRA for all or parts of the Forestry Access Track will also be considered during the next phase of the EIA once additional design information is available for the Proposed Development at the Forestry Access Track. Regarding coal mining, the track is in a former coal mining area and intersects some Development High Risk Areas. Further consideration will be given to coal mining features along the Forestry Access Track for the Final ES. This may include preparation of a CMRA for all sections of the track of limited sections of the track where development in the form of track improvement or widening may be needed.
- 11.16.4. Soil resources survey will be undertaken for the Northern Array and Southern Array. The survey will be used to provide data on the soil types, textures, and thicknesses. As a minimum this should include further targeted investigation where the Proposed Development may overlap with high sensitivity soils, but also further soil resource survey to confirm soil profiles in the Northern and Southern Arrays in areas where soils may be disturbed by the Proposed Development. This will be used to inform soil handling, to support successful implementation of measures to protect soils during construction of the Proposed Development to be defined in the Outline SMP with the Final ES.
- 11.16.5. Soil and peat survey will be undertaken for the Forestry Access Track as required once additional design information is available. This would include targeting areas around the existing track where there is potential for track improvement/ widening to be needed for the Proposed Development.
- 11.16.6. The extent of the soil survey presented in **Appendix 11B** is judged as being sufficient to provide a robust assessment of the potential for adverse changes to peat and peaty soil within the Proposed Development. Notwithstanding, it is recommended that prior to final ES submission the survey should be expanded to include confirmatory coring and soil characterisation of the discrete areas of peat and peaty soils within the Proposed Development that are not underlain by the infrastructure, but are in adjoining areas including;
  - Areas around T2;
  - Access track sections towards T1 and T3 around an area of flow convergence and low gradient; and
  - North-eastern section of the Southern Array where there is overlap with T6.
- 11.16.7. The primary purpose of this would be to allow a broader understanding of the peat resource within the Proposed Development that could be leveraged as part of the design of habitat management and biodiversity enhancement proposal. The results could also be used to

validate the assessment of potential hydrological connectivity between peat bodies and nearby infrastructure. The outcome would be presented in the Final ES.

- 11.16.8. The results could also be used to validate the assessment of potential hydrological connectivity between peat bodies and nearby infrastructure. The outcome will be presented in the Final ES.
- 11.16.9. The CEMP will be updated in support of the Final ES and any further measures arising from future surveys will be included.