VOLUME 2: GEOLOGY AND SOILS ENVIRONMENT

7. GEOLOGY AND SOILS ENVIRONMENT

7.1 Executive Summary

7.1.1 An assessment has been undertaken on geology, peat and soils (the geology and soils environment) during the construction and operational phases of the Proposed Development across the seven defined Sections of the project (Section 0 to Section 6). The assessment has also considered the potential effects of dismantling the existing overhead line (OHL) on the geology and soils environment.

7.1.2 Information for the study area was compiled using baseline data from a desk study which was verified by an extensive programme of investigative field work.

7.1.3 The assessment was undertaken considering the sensitivity of the receptors identified during the baseline study and considering the mitigation measures incorporated in the development design.

7.1.4 The scope of the assessment was informed by scoping responses and pre-application advice received from statutory and non-statutory consultees.

7.1.5 The assessment is supported by Appendices that consider potential effects on peat landslide and peat management, to ensure that there has been systematic consideration of peat throughout the development process.

7.1.6 Subject to adoption of best practice construction techniques and a project specific Construction Environmental Management Plan (CEMP), no significant adverse effects on the geology and soils environment have been identified for the Proposed Development.

7.2 Introduction

7.2.1 This Chapter considers the likely significant effects associated with the construction and operation of the Proposed Development on the geology and soils environment (soils, peat and geology). It also considers the effects associated with the dismantling of the existing 132 kV OHL and outlines standard best practice methods which have been incorporated into the design to prevent or reduce any identified effects and risks.

7.2.2 Further mitigation methods to address any potential effects are proposed, where appropriate, and residual effects are then assessed.

7.2.3 In addition, the assessment uses information and findings presented in **Volume 2, Chapter 4: Ecology** and **Volume 2, Chapter 6: Water Environment**. This Chapter also presents summary information from the following Appendices:

- **Appendix V2-7.1: Significance Criteria;**
- **Appendix V2-7.2: Peat Landslide Hazard and Risk Assessment (PLHRA); and**
- **Appendix V2-7.3: Peat and Carbon Management Plan (PCMP).**

7.2.4 This Chapter has been prepared by SLR Consulting Ltd (SLR), who has also undertaken the assessment. It has been informed by a detailed programme of site investigation and surveys undertaken by the report authors.

Statement of Qualifications

7.2.5 Production of this Chapter has been overseen and reviewed by Colin Duncan, a Technical Director for SLR Consulting with over 40 years experience as a geologist. His recent specialist area is Engineering Geological Assessment in the renewables and transmission sectors. He has been involved in engineering and geological assessment on a number of EIA projects for proposed wind farms, transmission lines and substations, providing both pre- and post-consent services in geological and geotechnical services. He has experience in

infrastructure design, geological assessment, borrow pit assessments, mining related studies and peat slide risk assessments.

7.2.6 A table presenting relevant qualifications and experience is included in **Appendix V1-5.1: EIA Team**, contained within Volume 5 of this EIA Report.

7.3 Scope of Assessment and Methodology

7.3.1 The potential effects from the Proposed Development on the geology and soils environment have been assessed by completing an initial desk study and a detailed programme of site investigation followed by an impact assessment.

7.3.2 This Chapter:

- describes the existing baseline established from desk studies, dedicated surveys and consultation;
- outlines the potential environmental effects on the geology and soils environment arising from the works associated with the Proposed Development, based on the information gathered and the analysis and assessments undertaken;
- provides an assessment of the potential direct and indirect impacts of the Proposed Development on ground conditions and land use;
- identifies any assumptions and limitations encountered in compiling the environmental information; and
- highlights any necessary monitoring and/or mitigation measures which could prevent, minimise, reduce or offset the possible significant environmental effects identified.

Study Area

7.3.3 The study area includes all elements of the Proposed Development, as described within **Volume 1, Chapter 3: Project Description** of this EIA Report. In addition, details of local geology and soil environments within a buffer of at least 250 m from the Proposed Development have been considered. The study area encompasses the Proposed Development as well as geological features which could potentially be affected by the construction and operation of the Proposed Development and dismantling of the existing OHL. The study area is shown on **Figure V2-7.1** and **Figure V2-7.2.**

Consultation and Scoping

7.3.4 The scope of the assessment has been determined through a combination of professional judgement, reference to relevant guidance documents and consultation with stakeholders through a formal EIA scoping process and pre-application advice.

7.3.5 Scoping responses, relevant to the geology and soils environment, are provided in **Table V2-7-1**.

Table V2-7-1: Scoping Responses

Organisation	Response	Comment
Energy Consents Unit (ECU)	Where there is a demonstrable requirement for peat landslide hazard risk assessment (PLHRA), the assessment should be undertaken as part of the EIA process.	A PLHRA has been carried out as part of this assessment and is included in **Appendix V2-7.2**.
The Highland Council (THC)	THC require that the EIA Report include; a. a full assessment on the impact of the development on peat, including peat probing for all areas where development is proposed;	The following confirms where each point listed in THC's response has been addressed: a. A peat probing campaign has been carried out across the project to

Organisation	Response	Comment
	b. carbon balance calculations should be undertaken and included within the EIA Report; c. a full description of the likely significant effects of the development on the local geology including aspects such as borrow pits, earthworks, site restoration and the soil, generally including direct effects and any indirect; and d. where borrow pits are proposed, details including location, size, nature and the final reinstated profile should be provided.	establish peat depth and appropriate mitigation (see **Appendix V2-7.3**); b. The potential loss of carbon associated with the Proposed Development is discussed within this Chapter and **Appendix V2-7.3;** c. This is included within this Chapter; and d. Borrow pits are not included within the section 37 consent application, and therefore not considered in detail within this EIA Report. However, indicative locations are provided in **Appendix V1-3.3**, and a preliminary appraisal of anticipated volume, and potential environmental constraints at each location is provided as part of this appendix.
Ironside Farrar (IF)	Given substantial areas of Class 1 and / or 2 peat along all seven sections of the route, as well as areas of Class 3 and 5 Peatland, and slopes of greater than 2 degrees present along the route, a PLHRA will be required. IF would anticipate that the PLHRA would include fieldworks and probing of towers, tracks, UGC and associated infrastructure. The PLHRA should be submitted as a standalone document closely linked to the geology / soils chapter and any peat management plan.	A PLHRA has been carried out as part of this assessment and is included in **Appendix V2-7.2**.
Ness District Salmon Fishery Board (NDSFB)	NDSFB request that particular attention in Section 5 of the project is paid towards the risk of peat, and land slide risk given landslide near Quoich Dam in 2018.	This has been considered within this Chapter.
NatureScot (NS)	NS advise that the EIA Report includes full details of the habitat survey results to NVC sub-community level supported by peat depth survey where relevant. They recommend that maps of the NVC polygons are included with all infrastructure and access routes overlain.	This Chapter and associated figures and appendices set out peat depth survey results and assessment of impacts on peat soils. Results of habitat surveys and assessment of likely impacts on ecological receptors are set out in **Volume 2: Chapter 4 - Ecology**.
	NS would expect the siting of infrastructure to avoid direct impacts to the features of the An Cleirach, Druim Losal and Quoich Spillway SSSIs and to ensure that rock faces and outcrops remain	Potential effects on these SSSIs are discussed in this Chapter.

Organisation	Response	Comment
	accessible and are not damaged or obscured.	
	Scottish Planning Policy affords 'significant protection' to carbon-rich soils, deep peat and priority peatland habitat. If such areas could be affected, NS would expect the EIA Report to demonstrate how any significant effects can be substantially overcome by siting, design or other mitigation. Site specific surveys should be carried out along to confirm the quality and distribution of peatland habitats. Peatland surveys should be carried out in accordance with the Peatland Survey 2017 "Guidance on Developments on Peatland", and proposed Peat Slide Risk Assessment should follow the latest 2017 guidance "Peat landslide hazard and risk assessments: best practice guide for proposed electricity generation developments".	The potential effects on carbon rich soils, deep peat and priority peatland habitats is discussed in this Chapter. The Proposed Development has been informed by a peat probing campaign to establish peat depth and appropriate mitigation (see **Appendix V2-7.3**), and a NVC survey to identify priority peatland habitats (see **Volume 2 – Chapter 4: Ecology**).
	NS advise that the EIA Report includes details of reinstatement and habitat restoration measures (including those associated with removal of the existing line) within a Peatland Management Plan and Habitat Management Plan.	A peat management plan is included in **Appendix V2-7.3**. The Applicant is committed to delivering a HMP for the Proposed Development, details of which will be provided and agreed upon with relevant consultees post submission of the application and prior to construction commencing, secured by a condition of consent.
Scottish Environment and Protection Agency (SEPA)	The project is identified as having an impact on Class 1 peatland. In addition to peat depth information, an assessment of peat habitat quality is also required. It should be demonstrated that impacts on good quality peatland habitats have been avoided. A peat management plan should be provided for the project. There may be areas where peat probing will be required to demonstrate the extent of deep peat and the options for avoidance.	Details of peat survey and assessment are set out in this Chapter. A peat management plan is included in **Appendix V2-7.3.**
	SEPA encourage the Applicant to outline any opportunities for habitat restoration or enhancement, particularly peatland restoration or improvements to riparian habitats.	A peat management plan is included in **Appendix V2-7.3**. The Applicant is committed to delivering a HMP for the Proposed Development, details of which will be provided and agreed upon with relevant consultees post submission of the application and prior to construction

Organisation	Response	Comment
		commencing, secured by a condition of consent.
	The planning submission must a) demonstrate how the layout has been designed to minimise disturbance of peat and consequential release of CO_2 and b) outline the preventative / mitigation measures to avoid significant drying or oxidation of peat through, for example, the construction of access tracks, drainage channels, cable trenches, or the storage and re-use of excavated peat.	This Chapter details the likely impacts from the Proposed Development on peat and an overview of peat management measures during construction.
	The submission must include: a. a detailed map of peat depths, to full depth, with all the built elements (including peat storage areas) overlain to demonstrate how the Proposed Development avoids areas of deep peat and other sensitive receptors such as GWDTEs; and b. a table which details the quantities of acrotelmic, catotelmic and amorphous peat which will be excavated for each element and where it will be re-used during reinstatement. Details of the proposed widths and depths of peat to be re-used and how it will be kept wet permanently must be included.	The peat management plan, included in **Appendix V2-7.3** comprises details regarding peat depth and re-use.
	To avoid delay and potential objection proposals must be in accordance with Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and Minimisation of Waste and SEPA's Developments on Peat and Off-Site uses of Waste Peat.	Assessment of likely impacts from the Proposed Development on peat in accordance with recognised guidance is included in this Chapter.

Potential Impacts

7.3.6 The following potential impacts have been assessed in full in relation to the Proposed Development:

- erosion and sedimentation which could give rise to potential impact on soil quality and resource during forest felling from construction and operation;
- potential impact on areas of peat during construction, operation and dismantling activities;
- potential impact on areas of geology during construction, operation and dismantling activities; and
- potential cumulative impact during construction, operation and dismantling activities.

Issues Scoped Out

7.3.1 As assessment of potential cumulative effects associated with the Proposed Development and other proposed electrical transmission projects has also been 'scoped out' of the assessment. Other developments would also be designed, developed, and managed in accordance with best practice, industry standards and relevant legalisation, planning policy and guidance regulated by statutory consultees. These standards ensure, with respect to the geology and soils environment, potential impacts are mitigated and controlled at source.

7.3.2 It will be necessary to establish borrow pits and construction compounds to facilitate the Proposed Development. They do not form part of this consent application and measures required to control or mitigate the potential effects of these on the environment will be presented as part of their respective planning application(s). Indicative locations and a preliminary appraisal of the potential environmental constraints associated with these works is included in **Appendix V1-3.3**.

Policy and Guidance

7.3.3 Relevant policy and guidance documents have been reviewed and considered as part of this assessment.

Planning Policy

7.3.4 In addition to Scottish Planning Policy (SPP) published by The Scottish Government[1], THC Highland-wide Local Development Plan (HwLDP)[2] provides planning guidance on the type and location of development that can take place in the region. The LDP presents development polices of which the following are relevant to this study:

- Policy 53: Minerals;
- Policy 54: Mineral Wastes;
- Policy 55: Peat and Soils; and
- Policy 69: Electricity Transmission Infrastructure.

Guidance

- SEPA Regulatory Position Statement - Developments on Peat (SEPA, 2010);
- Good Practice during Windfarm Construction, 4th Edition (Scottish Renewables, Scottish Natural Heritage (now NatureScot), SEPA, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science and AEECoW, 2019);
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, January 2017);
- Developments on Peatland - Guidance on the assessment of peat volumes, re-use of excavated peat and the minimisation of waste (Scottish Renewables & SEPA, 2012);
- Floating Roads on Peat - Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with particular reference to Wind Farm Developments in Scotland (Forestry Commission Scotland & Scottish Natural Heritage, 2010);
- Managing Geotechnical Risk: Improving Productivity in UK Building and Construction (Institution of Civil Engineers, 2001);
- Ground Engineering Spoil: Good Management Practice CIRIA Report 179 (CIRIA, 1997);
- Scottish Roads Network Landslides Study Summary Report (Scottish Executive, 2005); and
- Guidelines for the Risk Management of Peat Slips on the Construction of Low Volume/Low Cost Roads on Peat (Forestry Commission, 2006).

[1] The Scottish Government (2014) Scottish Planning Policy

[2] The Highland Council (April 2012) Highland-wide Local Development Plan

Desk Study

7.3.5 A desk-based review of soil and geological maps, Ordnance Survey (OS) mapping and Digital Terrain Model (DTM) mapping has been undertaken. Baseline data with respect to geology and soils environment has been collected from publicly available information and open-source data from a range of sources. The data review includes:

- NatureScot Environment map viewer[3];
- British Geological Survey (BGS) Geoindex mapping[4];
- NatureScot SiteLink[5];
- Department for Environment, Food and Rural Affairs (DEFRA) Multi-Agency Geographic Information for the Countryside (MAGIC) online viewer[6];
- Public Health England UK Radon Map[7];
- The Coal Authority Interactive Map[8];
- Zetica UXO Risk Maps[9];
- A review of current and historical Ordnance Survey maps; and
- Site Specific Ground Investigation (GI) Reports (Card Geotechnics Ltd).

Field Work

7.3.6 The geologists and hydrogeologists have worked closely on this assessment to ensure that appropriate information is gathered to allow a comprehensive impact assessment to be completed.

7.3.7 Detailed site visits and walkover surveys have been undertaken by SLR on the following dates:

- October 2021 – reconnaissance visit of the route. The length of the Proposed Development was walked or driven;
- November / December 2021 – Section 3 peat probing to collect peat depth and condition data;
- January 2022 – Section 6 peat probing to collect peat depth and condition data;
- February 2022 – Section 0, Section 1 and Section 2 peat probing to collect peat depth and condition data; and
- No peat probing was undertaken along Sections 4 and 5. The assessment for these sections has been primarily desk based supported by GI information.

7.3.8 In addition, a programme of intrusive field investigation was undertaken by Card Geotechnics Limited (CGL) between the following dates:

- Section 1 – 22 November 2021 and 4 February 2022[10] which included investigation at the location of 66 of the 86 proposed towers;
- Section 2 – 12 January 2022 and 22 March 2022[11] which included investigation at the location of 27 proposed towers and 15 km of the underground cable route;

[3] Nature Scot, The Scottish Government., (2016). available at: https://www.environment.gov.scot/ [Accessed 22 March 2022]
[4] British Geological Survey (BGS) Online Viewer/Geoindex website, available at: http://mapapps.bgs.ac.uk/geologyofbritain/home.html ; http://www.bgs.ac.uk/geoindex / [Accessed 22 March 2022]
[5] NatureScot SiteLink, available at: https://sitelink.nature.scot/about [Accessed 22 March 2022]
[6] Department for Environment, Food and Rural Affairs (2013), available at: https://magic.defra.gov.uk/ [Accessed 22 March 2022]
[7] UK Radon Map (2022), available at: https://www.ukradon.org/information/ukmaps [Accessed 22 March 2022]
[8] Coal Authority (2022), available at: https://mapapps2.bgs.ac.uk/coalauthority/home.html [Accessed 22 March 2022]
[9] Zetica UXO (2022), available at: https://zeticauxo.com/downloads-and-resources/risk-maps/ [Accessed 22 March 2022]
[10] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 1 Edinbane Substation to Sligachan, Geotechnical Interpretative Report, Revision 0
[11] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 2 Broadford to Sligachan, Geotechnical Interpretative Report, Revision 0

- Section 3 – 1 November 2021 and 8 April 2022[12] which included investigation at the location of 77 proposed towers;
- Section 4 – 4 May 2021 and 13 October 2021[13] which included investigation at the location of 155 of the 170 proposed towers;
- Section 5 – 16 August 2021 and 25 November 2021[14] which included 90 exploratory holes; and
- Section 6 – 18 November 2021 and 11 January 2022[15] which included 15 exploratory holes at proposed Cable Sealing End (CSE) Compounds and horizontal directional drilling (HDD) locations, and 69 exploratory trial pit locations.

7.3.9 The field work has been undertaken in order to:

- verify the information collected during the desk and baseline study;
- undertake a visual assessment of the site and main geological features;
- inspect rock exposures and establish by probing, an estimate of overburden thicknesses, peat depth and stability;
- confirm underlying substrate, based on the type of refusal of a peat probe and by coring; and
- allow appreciation of the site, determine gradients, access routes, ground conditions, etc., and to assess the relative location of all the components of the Proposed Development.

7.3.10 The desk study and field surveys have been used to identify potential development constraints and have been used as part of the iterative design process.

Significance Criteria

7.3.11 The significance of effects of the Proposed Development has been assessed by considering two factors: the sensitivity of the receiving environment and the potential magnitude of impact, should that effect occur.

7.3.12 This approach provides a mechanism for identifying the areas where mitigation measures are required and for identifying mitigation measures appropriate to the significance of likely effects presented by the Proposed Development.

7.3.13 Criteria for determining the significance of effect are provided in **Appendix V2-7.1**.

Limitations of the Assessment

7.3.14 The assessment uses site investigation and survey data and publicly available data sources, including but not limited to SEPA, NatureScot, BGS, and commercial data supply companies, as well as additional information supplied from stakeholders during the scoping and consultation stages.

7.3.15 It is considered that the data and information used to complete this assessment is robust and that there are no significant data gaps or limitations.

7.4 Baseline

7.4.1 This part of the Chapter describes the present conditions which constitute the existing baseline environment for geology and soils within the study area. For a description of the Proposed Development, and the proposed

[12] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 3 & 3A Broadford to Kylerhea, Geotechnical Interpretative Report, Revision 0

[13] Card Geotechnics Limited (2021) LT91 Fort Augustus to Skye OHL Reinforcement – Section 4: Geotechnical Interpretative Report. Revision 0.

[14] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 5 Quoich to Invergarry: Ground Investigation Report. Revision 1.

[15] Card Geotechnics Limited (2022), LT91 Fort Augustus to Skye OHL Reinforcement – Section 6: Geotechnical Interpretative Report. Revision 0.

works relevant to each of the seven sections, refer to **Volume 1, Chapter 3: Project Description**, and **Volume 2: Chapter 2: Section by Section Overview.**

Section 0

Designated Sites

7.4.2 Within the study area for Section 0, the An Cleireach SSSI and Geological Conservation Review (GCR) sites are present, see **Figure V2-7.1 (Map 4)**. These comprise a 64.81 ha site designated for a Tertiary igneous intrusion, which is of significant petrogenetic importance in revealing the characteristics of the dyke-like bodies and sills containing gabbroic-anorthosite and gabbro which intrude the plateau lavas of northwest Skye.

7.4.3 There are no other sites designated for geological, soils or peat interests that are present within 1 km of the study area within Section 0.

Land Use and Topography

7.4.4 The land use within Section 0 is mainly rural settlements, public roads, moorland and forested areas with occasional tracks and roads for woodland maintenance. A number of small streams flow down the southern slopes of moorland summits and peaks.

7.4.5 In the north of Section 0 ground elevations generally decrease westwards towards Loch Bay and the Bay River from between approximately 95 m Above Ordnance Datum (AOD) to less than 10 m AOD near the banks of Loch Bay and Bay River. Ground elevations within the south of the Section fall to the south towards Loch Caroy.

Slope

7.4.6 In areas with sloping ground, the composition and extent of the superficial geology affects the stability of the slopes and therefore the potential for landslide.

7.4.7 The Proposed Development within Section 0 traverses the Watermish Peninsula before heading further inland. Slope mapping indicates that gradient of the slope varies from 0 degrees to 8 degrees within the study area of this Section, with isolated areas that pass over or intersect areas of slope gradients between 8 to 12 degrees.

Soils

7.4.8 The Carbon and Peatland 2016 map[16] shows the distribution of peatland classes across Scotland. The details of the classifications are shown in **Table V2-7-2**. The mapping shows peat may be present within Section 0, and where peat is indicated, the majority has been classified as Class 1. Small areas of other peat class are also mapped within the study area for Section 0, the details of which are shown on **Figure V2-7.3 (Maps 1-4)**.

Table V2-7-2: Classification of Peat

Class of Peat	Peat Description	Indicative Soil	Indicative Vegetation
1	Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value.	Peat Soil	Peatland

[16] NatureScot, (2016) Carbon and Peatland 2016 map. Available from: http://map.environment.gov.scot/soil_maps/ Scottish Government, 2016, [Last accessed 22 March 2022]

Class of Peat	Peat Description	Indicative Soil	Indicative Vegetation
2	Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential.	Peat soil with occasional peaty soil	Peatland or areas with high potential to be restored to peatland
3	Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat.	Predominately peaty soil with some peat soil	Peatland with some health
4	Area unlikely to be associated with peatland habitat or wet and acidic soils. Area unlikely to include carbon-rich soils.	Predominantly mineral soil with some peat soil	Heath with some peatland
5	Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat.	Peat soil	No peatland vegetation
0	Mineral soil – Peatland habitats are not typically found on such soils.	Mineral soils	No peatland vegetation

7.4.9 Peat is defined as a material consisting of the partially decomposed remains of plant material and organic matter preserved over a period in a waterlogged environment resulting in anaerobic conditions and is of depths >0.5 m. Accumulations of peat less than 0.5 m thick are too thin to be classified as true peat deposits and are often classified as organic soils or peaty soils.

7.4.10 Within the study area of the Proposed Development there are a range soil types recorded on the National soil map of Scotland[17]. The study area within Section 0 comprises mainly peaty gleys, with isolated pockets of other soil types including:

- peaty gleys;
- mineral gleys;
- mineral podzols; and
- brown soils.

7.4.11 As part of the baseline assessment, a comprehensive peat probing and characterisation exercise has been conducted within the study area for the Proposed Development within Section 0. The peat depths are shown on **Figure V2-7.4 (Maps 1-4)**. For Section 0, no ground investigation works were undertaken.

7.4.12 A summary of the results relevant to Section 0 is noted below (see also **Appendix V2-7.2** and **Appendix V2-7.3**):

- the presence and depth of peat was assessed at 328 H pole locations along Section 0 of the Proposed Development;
- peat was found to be limited along the Section footprint with the majority being classified as a soil (i.e., less than 0.5 m depth) draped extensively across glacial till and bedrock and dissected by watercourses;

[17] Scottish Government, 2022, National Soil Map of Scotland. Available from: https://map.environment.gov.scot/Soil_maps/?layer=1 [Last accessed 22 March 2022]

- a total of 138 H pole locations have been identified as located within areas of deep peat (>0.5 m deep) and only 34 over 1.0 m. One H pole location exceeds 3.0 m depth of peat.
- the overall conclusion regarding peat stability is that there is negligible to low risk of peat instability over most of the Section although some limited areas of medium risk have been identified; and
- a hazard impact assessment has been completed, which has concluded that subject to the employment of appropriate mitigation measures, all these areas can be considered constructable with minimal peat slide risk.

Superficial Geology

7.4.13 The BGS published mapping indicates that the superficial geology present within the Section 0 study area comprises alluvium, peat and till deposits. The superficial deposit covering the majority of the Section 0 study area is mapped as peat. There are sporadic areas within the Section 0 study area that are mapped without superficial deposits. The published superficial geology is illustrated in **Figure V2-7.1 (Maps 1-4)**.

Bedrock Geology and Linear Features

7.4.14 The north and west of Skye including the Watermish Peninsula comprises the laterally extensive and thick Paleogene plateau type lava fields and pyroclastic rocks, overlying Jurassic sedimentary rocks which crop out along the west coast. The Skye Lava Group mainly basalt and basic tuffs.

7.4.15 A summary of the published bedrock geology of the site and surrounding area for Section 0 is presented in **Table V2-7-3**. The published bedrock geology is illustrated in **Figure V2-7.2 (Maps 1-4)**.

Table V2-7-3: Bedrock Geology - Section 0

Age	Stratigraphic Group	Unit	Description
Paleogene (23 – 66 Ma)	North Britain Palaeogene Dyke Suite	Dykes	Variously: Basalt & micrograbbro, olivine-basalt, troctolite, bytownite, Grabbro
Paleogene (56 – 66 Ma)	Skye Lava Group	Dykes and Sills	Variously: Basalt & microgabbro, hawaiite and mugearite, benmoreite, trachyte, feldspar phyric hawaiite

7.4.16 There are no faults recorded in the northern part of Section 0 around the Watermish peninsula. There are however several faults shown within the central and southern part of the Section 0 study area on BGS 1:50,000 scale mapping, with several recorded to pass beneath the Proposed Development. These are continuous faults that generally trend north-west – south-east, while some shorter faults are present that vary in orientation from west – east to north-east – south-west.

Hydrogeological Conditions

7.4.17 The hydrogeological setting of the study area and ground conditions are described in detail within **Volume 2, Chapter 6: Water Environment**. A summary is included below.

7.4.18 The aquifer status within the majority of the bedrock of the study area of Section 0 is characterised as a Class 2C a '*low productivity aquifer*', where '*flow is virtually all through fractures and other discontinuities*'[18].

7.4.19 The glacial and peat superficial deposits are not considered an important aquifer. These are likely to be discontinuous and limited in extent and as such can have limited groundwater potential.

7.4.20 Hydrogeological conditions are considered to be similar across the length of the Proposed Development and are therefore not discussed further for the other sections under Baseline.

Mineral Resources

7.4.21 The HwLDP states that a mineral audit will be conducted to assess mineral supply, and should the result of the audit highlight a need, THC will seek to identify areas of search and areas to be safeguarded for minerals. At the present time no mineral safeguarding plans have been formulated by THC and therefore the superficial or bedrock geology within the study area are not recorded as safeguarded minerals.

7.4.22 THC minerals audit of 2015-2016[19] has no records of active quarries within the study areas or surrounding areas for Section 0.

Radon Gas

7.4.23 The UK Radon Plan indicates that the majority of the study area of Section 0 is located in an area where less than 1 % of homes are at or above the National Radiological Protection Board (NRPB) action level therefore the risk of significant ingress of radon into structures on-site is considered low.

7.4.24 Particular areas along the southern point of Loch Bay are indicated to be in bands of elevated radon potential, the maximum potential is noted as 1 – 3 %.

7.4.25 Given the anticipated ground conditions, the risk associated with ground gas is considered generally low risk in accordance with BS8576[20]. Current advice confirms that protection measures would not be required for any permanently enclosed structure. This is therefore not considered further in this assessment beyond identifying potential within other sections of the Proposed Development.

Historical Past Use and Contaminated Land

7.4.26 The 1:10,000 scale historical maps for the study area have been reviewed. In general, these show that the study area has been predominantly forest or moorland with scattered settlements from the 1800s to present day.

7.4.27 The study area is not within a coal mining reporting area and there are no coal bearing bedrock units present.

7.4.28 There is no record of any mining underlying the study area, although there are several records of ceased gravel pits, these appear to have been small scale and are generally located adjacent to existing roads or other infrastructure.

7.4.29 Contaminated soils are generally associated with historical or current industrial activities where localised or widespread contamination has occurred. In general, these former activities are concentrated in and around urban areas, or in rural areas which served specific industries or activities (e.g. mining).

[18] Scotland's Environment, Scottish Government (2018). available at: https://map.environment.gov.scot/sewebmap/ [Accessed 22 March 2022]

[19] Highland Council Minerals Audit 2015-2016, available at: https://www.arcgis.com/apps/webappviewer/index.html?id=80b35ea0385a44728b6e4dacc07a4719 [accessed on 22 March 2022]

[20] BSI Standards Publication 2013, BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)

7.4.30 Information on the status of the soils with regard to contamination along the route of the Proposed Development was sought from THC and SEPA. Consultation with THC, site visits and information provided for the EIA Report has identified a number of former land uses within the study area for the Proposed Development, where there is some potential for contaminated land to be encountered.

7.4.31 These may include:

- areas of former mineral workings;
- sites of limited agricultural activity; and
- sites associated with current or former electrical transmission infrastructure.

7.4.32 These are examples of typical current and previous land uses and given the predominantly rural nature of the study area, it is unlikely that a large number of such sites would be encountered during construction or dismantling activities.

7.4.33 The SEPA[21] website was consulted for the presence of landfills (authorised and historic). The search identified no licensed sites within the study area for the Proposed Development.

7.4.34 Contaminated land on construction workers and human receptors from pre-existing ground conditions has been effectively ruled out of further assessment, as no contamination sources have been identified along the route of the Proposed Development as part of this assessment. Where potentially contaminated sites are encountered during project works, the Principal Contractor would undertake further assessment. Other than some further baseline details identified for Section 2 and Section 5, Contaminated Land and Past Use are not discussed further in this assessment.

Unexploded Ordnance (UXO)

7.4.35 The Zetica UXO mapping indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing. There is no evidence of any areas impacted by UXO within the study area. The Proposed Development area is identified as a Low Risk site. Therefore, this is not considered further within this assessment.

Section 1

Designated Sites

7.4.36 The study area of Section 1 contains the following designated sites:

- Sligachan SSSI. A 532 ha site designated for its blanket bogs and peat related landscape features; and
- Sligachan Peatlands Special Area of Conservation (SAC). A 1,438 ha site designated for freshwater habitats and upland habitats including blanket bog, mires, and heathland.

7.4.37 The designated sites are shown on **Figure V2-7.1 (Maps 6-8)**.

7.4.38 There are also a number of sites designated for geological, soils or peat interests that are present within 1 km of the study area of Section 1, outlined below. It is considered that the distance between the Proposed Development and the designated site provides geographical separation. Therefore, the designated sites are beyond the reach of impact from the Proposed Development and are not considered further within this assessment:

[21] Scottish Environment Protection Agency (SEPA), Waste site information. Available from: https://www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/waste-site-information/ [Last accessed 22 March 2022]

- Ros a' Mheallain GCR. A 96 ha site located near the western extent of the site on Beinn na Cloiche. It is thought to be designated for its tertiary igneous features. A NatureScot research report from 2018[22] recorded the GCR category as *"igneous petrology"*, the abstract of the feature is noted as *"a sequence of glacial deposits has yielded pollen and beetle remains…"*;
- Roineval GCR and SSSI. A 42 ha site designated for tertiary igneous features. It is located in the hills to the north-west of Sligachan and east of the A863 road; and
- Cullins Hills GCR and SSSI. Designated for tertiary and quaternary geological features. The Cuillins are noted as the best area in Britain for the study of a major Palaeogene age volcanic complex. The Cuillins encompasses the dramatic, jagged peaks of the main Cuillin ridge and the adjacent Bla Bheinn, as well as the more rounded summit of Marsco.

Land Use and Topography

7.4.39 In Section 1 land use is rural, comprising mainly moorland and forested areas with public roads and forest tracks. The Proposed Development passes to the west of the hamlet of Glenmore and Mugeary. A number of streams and rivers traverse the hilly terrain. Ground elevations are generally between 100 m AOD and 200 m AOD, with small hilly areas. Elevations increase south and north of the study area.

Slope

7.4.40 The Proposed Development within Section 1 traverses the upland areas of central Skye. Slope mapping indicates that gradient of the slope varies from 0 degrees to 8 degrees within the study area of this Section, with isolated areas that pass over or intersect areas of slope gradients between 8 to 12 degrees.

Soils

7.4.41 Soil types within the study area of Section 1 were identified as follows:

- peaty gleys;
- mineral podzols; and
- peat.

7.4.42 The Carbon and Peatland 2016 Map identifies the predominant peat classifications as Class 1 and Class 5. Areas of other peat class are also mapped within the study area. Refer to **Figure V2-7.3 (Maps 4 – 7)** for further details.

7.4.43 As part of the baseline assessment a comprehensive peat probing and characterisation exercise has been conducted within the study area for the Proposed Development within Section 1. The peat depths are shown on **Figure V2-7.4 (Maps 4-7)**.

7.4.44 A summary of the results relevant to Section 1 is noted below (see also **Appendix V2-7.2** and **Appendix V2-7.3**):

- the presence and depth of peat was assessed at 75 steel tower locations and along the length of the OHL route in Section 1;
- peat was found to be extensive along the Section footprint draped extensively across glacial till and bedrock and dissected by watercourses;

[22] NatureScot (2018), available at https://www.nature.scot/sites/default/files/2019-06/Publication%202018%20-%20SNH%20Research%20Report%201014%20-%20Appendix%201%20-%20Site%20codes%20data.xls [accessed on 14 April 2022]

- a total of 65 tower locations have been identified as located within areas of peat (>0.5 m deep) with only 38 tower locations identified on peat over 1.0 m and 11 tower locations on peat that exceeds 2.5 m;
- the overall conclusion regarding peat stability is that there is negligible to low risk of peat instability over most of the Section although very limited areas of medium risk have been identified; and
- a hazard impact assessment has been completed, which has concluded that subject to the employment of appropriate mitigation measures, all these areas can be considered constructable with minimal peat slide risk.

7.4.45 Ground investigation works carried out within Section 1 reported that "*Peat generally occurred as firm or plastic slightly sandy pseudofibrous peat to a maximum depth of 6.4 m bgl…On average, peat deposits were around 1.5 m in thickness across Section 1*" [23].

Superficial Geology

7.4.46 The BGS published mapping indicates that the superficial geology present within the Section 1 study area comprises alluvium, peat and till deposits. The superficial deposit covering the majority of the Section 1 study area is mapped as peat. Within Section 1, sporadic areas within the study area are mapped without superficial deposits. The published superficial geology is illustrated in **Figure V2-7.1 (Maps 4-7).**

7.4.47 CGL oversaw an investigation programme within Section 1 of the project which included boreholes which were advanced to 6.3 m and 16.5 m below ground level. The ground investigation noted that *"… superficial strata across the route vary depending on physical characteristics of the proposed tower location and the proximity to physical features (e.g., plateaus, rivers etc). There is little spatial association between different superficial deposits."* [24]

7.4.48 The superficial deposits recorded across Section 1 comprise River Terrace deposits, Head and Glacial Till. River Terrace deposits were encountered in two locations adjacent to rivers and burns to a maximum depth of 5.7 m bgl. The deposits comprised *"orangish brown silty very gravelly sand, with gravels of basalt."*[25]

7.4.49 Head deposits were encountered in six locations near the Varragill Forest where the topography was steeply sloping. The deposit *"comprised clayey gravelly sand and clayey sandy gravel, with gravel of microgabbro and basalt. The stratum was noted to be between 1.1 m and 4.0 m in thickness."*[26]

7.4.50 "*Glacial Till occurs across the length of the route generally at the base and side of valleys; and was recorded between 0.4 m and 7.4 m thick, to a maximum depth of 11.5 m bgl. The stratum was recorded in 25 locations, all underlying Peat deposits."*[27]

Bedrock Geology and Linear Features

7.4.51 Section 1 has similar bedrock geology to that of Section 0. The north and west of Skye comprises the laterally extensive and thick Paleogene plateau type lava fields and pyroclastic rocks, overlying Jurassic sedimentary rocks which crop out along the west coast. The Skye Lava Group mainly basalt and basic tuffs.

7.4.52 A summary of the published bedrock geology of the site and surrounding area for Section 1 is presented in **Table V2-7-4**. The published bedrock geology is illustrated in **Figure V2-7.2 (Maps 4-7)**.

[23] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 1 Edinbane Substation to Sligachan, Geotechnical Interpretative Report, Revision 0
[24] Ibid.
[25] Ibid.
[26] Ibid.
[27] Ibid.

Table V2-7-4: Bedrock Geology – Section 1

Age	Stratigraphic Group	Unit	Description
Paleogene (23 – 66 Ma)	North Britain Palaeogene Dyke Suite	Dykes	Variously: Basalt & micrograbbro, olivine-basalt, troctolite, bytownite, Grabbro
Paleogene (56 – 66 Ma)	Skye Lava Group	Dykes and Sills	Variously: Basalt & microgabbro, hawaiite and mugearite, benmoreite, trachyte, feldspar phyric hawaiite

7.4.53 The CGL ground investigation noted that *"there is little variation in the bedrock deposits across Section 1. The predominant geological unit is the Skye Lava Group; of which basalt, microgabbro and mugearite were encountered."* [28]

7.4.54 There are several faults shown within the Section 1 study area on BGS 1:50,000 scale mapping, with several recorded to pass beneath the Proposed Development. These are continuous faults that generally trend north-west – south-east, while some shorter faults trend roughly east north-east to west south-west. Faulting and seismicity are not known to occur within this area in recent times.

Mineral Resources

7.4.55 THC minerals audit of 2015-2016[29] has no records of active quarries within the study area or surrounding area for Section 1.

Radon Gas

7.4.56 The UK Radon Plan indicates that the majority of the study area of Section 1 is located in an area where less than 1 % of homes are at or above the NRPB action level therefore the risk of significant ingress of radon into structures on-site is considered low.

Section 2

Designated Sites

7.4.57 The study area for Section 2 does not contain any designated sites of relevance to the geology and soils environment.

7.4.58 There is one site designated for geological, soils or peat interests within 1 km of the study area within Section 2; the Meall A' Mhaoil GCR and SSSI, see **Figure V2-7.1 (Maps 8 and 9)**. A 297 ha site designated for its

[28] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 1 Edinbane Substation to Sligachan, Geotechnical Interpretative Report, Revision 0

[29] Highland Council Minerals Audit 2015-2016, available at: https://www.arcgis.com/apps/webappviewer/index.html?id=80b35ea0385a44728b6e4dacc07a4719 [accessed on 22 March 2022]

exposures of Paleogene granite intrusions and felsic, mafic-felsic hybrid rocks of the Western Red Hills and contacts of granite with Precambrian country rock.

7.4.59 It is considered that the distance between the Proposed Development and the designated site provides geographical separation. Therefore, it is concluded that the designated site is beyond the reach of impact from the Proposed Development and is therefore not considered further within this assessment:

Land Use and Topography

7.4.60 The land use within Section 2 is mainly rural settlements, public roads, moorland and forested areas with tracks used for recreational purposes. Section 2 broadly follows the A87 southwards towards Luib and Broadford. Section 2 lies to the north of the Red Hills (Red Cullin Hills) and passes within the vicinity of Loch Sligachan and Loch Ainort. The Proposed Development crosses a number of rivers or streams that flow northwards from the slopes of the Red Hills summits and peaks.

7.4.61 Analysis of mapping indicates that ground elevations within the study area for Section 2 are generally around 50 m AOD to 150 m AOD. Decreasing below 50m AOD through stream and river valleys around the banks and heads of the lochs.

Slope

7.4.62 Section 2 lies to the north of the Red Hills. Slope mapping indicates that gradient of the slope generally ranges from 0 degrees to 8 degrees within the study area of Section 2, with isolated areas associated with the northern slopes of the Red Hills within the study area that pass over or intersect areas of slope gradients in excess of 12 degrees.

Soils

7.4.63 Soil types within the Section 2 study area were identified as follows:

- peaty gleys;
- peaty podzols;
- mineral podzols; and
- immature soils.

7.4.64 The majority of soils comprise peaty gleys and peaty podzols. The Carbon and Peatland 2016 Map identifies the predominant peat classification as Class 3. Areas of other peat class are also mapped within the study area. Refer to **Figure V2-7.3 (Maps 8 – 10)** for further details.

7.4.65 As part of the baseline assessment a comprehensive peat probing and characterisation exercise has been conducted within the study area for the Proposed Development within Section 2. The peat depths are shown on **Figure V2-7.4**.

7.4.66 A summary of the results relevant to Section 2 is noted below (see also **Appendix V2-7.2** and **Appendix V2-7.3**):

- the presence and depth of peat was assessed at 279 locations along the route of the underground cable and at 30 steel tower locations along Section 2 of the Proposed Development;
- peat was found to be limited along the Section footprint with the majority being classified as a soil (i.e., less than 0.5 m depth) draped across glacial deposits and bedrock and dissected by watercourses;
- a total of 7 tower locations and have been identified as located within areas of peat (>0.5 m deep) with no tower locations identified on peat recorded over 1.0 m, while 17 locations along the route of the underground cable recorded peat at depths over 1.0 m.

- the overall conclusion regarding peat stability is that there is negligible to low risk of peat instability across the Section, with very limited areas of medium risk; and
- a hazard impact assessment has been completed, which has concluded that subject to the employment of appropriate mitigation measures, all these areas can be considered constructable with minimal peat slide risk.

7.4.67 Ground investigation works carried out within Section 2 reported that where peat was encountered it was generally described as "*spongy dark brown pseudofibrous peat" and typically less than 1.0 m in thickness."*

Superficial Geology

7.4.68 The BGS published mapping indicates that the superficial geology present within the Section 2 study area comprises alluvium, peat and till deposits. Section 2 comprises large areas mapped without superficial deposits indicating that bedrock is at or near the surface.

7.4.69 CGL oversaw an investigation programme within Section 2 of the project which included *"43 exploratory boreholes at proposed locations along the proposed OHL and underground cable route. In addition, machine excavated trial pits were excavated both along the underground cable route, and in proximity to towers with bedrock shallower than 3.50m bgl, to confirm the depth to bedrock."*[30]

7.4.70 The ground investigation encountered alluvium, raised marine deposits and glacial till. Alluvium was recorded at one borehole location and three trial pit locations at a maximum depth of 2.2m bgl. These deposits were typically located adjacent to rivers and burns.[31]

7.4.71 *"Raised Marine Deposits were encountered where the underground cable route passes closest to the end of Loch Ainort and the end of Loch Sligachan."*[32] The unit was recorded to be between 0.1m and 1.5m in thickness. *"Glacial Till occurs across the length of the route generally at the base and side of valleys; and was recorded between 0.15m and 8.1m thick, to a maximum depth of 8.5m bgl, either underlying peat or from surface."*[33]

Bedrock Geology and Linear Features

7.4.72 The central portion of the island of Skye is dominated by the Skye Western and Eastern Red Hills Centre, the last focal point of volcanic activity preserved on Skye. These, with the Cullins Hills, give rise to the mountainous region in the centre of Skye. The Red Hills are formed by Lower Tertiary (Paleogene) intrusive rocks dominated by grabbro and granite. The igneous rocks have been intruded into the older Torridon and Lias Group sedimentary rocks, which still crop out in some locations.

7.4.73 A summary of the published bedrock geology of the site and surrounding area for Section 2 is presented in **Table V2-7.5.** The published bedrock geology is illustrated in **Figure V2-7.2 (Maps 8 – 10).**

Table V2-7-5: Bedrock Geology – Section 2

Age	Stratigraphic Group	Unit	Description
Paleogene (23 – 66 Ma)	North Britain Palaeogene Dyke Suite	Dykes	Variously: Basalt & micrograbbro, olivine-basalt,

[30] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 2 Broadford to Sligachan, Geotechnical Interpretative Report, Revision 0
[31] Ibid.
[32] Ibid.
[33] Ibid.

Age	Stratigraphic Group	Unit	Description
			troctolite, bytownite, Grabbro
	Red Hills Centre (Multiple Phases)	Beinn Deag Mhor Granite	Granite, granophyric
		Broadford Gabbro	Gabbro
		Marsco Granite	Granite, granophyric
		Beinn Na Cro Granite	Granite, granophyric
		Glas Bheinn Mhor Granite	Granite, granophyric
Paleogene (56 – 66 Ma)	Skye Lava Group	Dykes and Sills	Variously: Basalt & microgabbro, hawaiite and mugearite, benmoreite, trachyte, feldspar phyric hawaiite
Jurassic (145 to 201 Ma)	N/A	Pabay Shale Formation	Mudstone
	N/A	Ardnish Formation	Sandstone and mudstone
	N/A	Breakish Formation	Limestone with sandstone and argillaceous rocks
	N/A	Bearreraig Sandstone Formation	Mudstone, sandstone and limestone
Permian (247 to 272 Ma)	N/A	Stornoway Formation	Sandstone and conglomerate
Ordovician (446- 478 Ma)	N/A	Strath Suardal Formation	Dolostone
Neoproterozoic	N/A	Applecross Formation	Sandstone

7.4.74 Across much of the Section 2 study area there are no faults recorded on BGS 1:50,000 scale mapping. However, along the southern shore of Loch Sligachan there are several faults recorded, generally trending north-west to south-east. Faulting and seismicity are not known to occur within this area in recent times.

7.4.75 The ground investigation observed that the bedrock geology varied across the OHL and underground cable route, the bedrock geology is igneous rock *"attributed to either the North Britain Paleogene Dyke Suite, Skye Lava Group or Skye Central Complex. Sedimentary bedrock of the Breakish Formation and Bearreraig Sandstone Formation"*[34] was encountered southwest of Sconser and west of Strollamus.

[34] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 2 Broadford to Sligachan, Geotechnical Interpretative Report, Revision 0

7.4.76 The CGL report notes that there is natural variability in the rockhead upslope and/or downslope of the borehole positions. This is anticipated to be a result of the hummocky geomorphology of the surrounding area. Generally, the rockhead was measured between 1.4m and 2.0m bgl.

Mineral Resources

7.4.77 THC has one record of an active quarry within the surrounding area (outside of the study area) of Section 2: Sconser Quarry, to the east of Sconser, noted for working sandstone.

Radon Gas

7.4.78 The UK Radon Plan indicates that the majority of the study area of Section 2 is located in an area where less than 1 % of homes are at or above the NRPB action level therefore the risk of significant ingress of radon into structures on-site is considered low.

7.4.79 Particular areas along Loch Sligachan and Loch na Cairidh are indicated to be in bands of elevated radon potential, the maximum potential is noted as 1 – 3 %.

Historical Past Use and Contaminated Land

7.4.80 In addition to the points raised for Section 0, within Section 2 the dormant (inactive) Sligachan Quarry is situated north of Sligachan adjacent to the A87.

Section 3

Designated Sites

7.4.81 The study area of Section 3 contains the following designated sites:

- Mointeach nan Lochan Dubha SAC and SSSI – comprising and cited for presence of blanket bog, depressions on peat substrates, acid peat stained lakes and ponds, oligotrophic to mesotrophic standing water, transition mires and quaking bogs; and
- Kinloch and Kyleakin Hills SAC and SSSI – comprising an area of highlands at the eastern end of the island of Skye. The site is cited for important flora and fauna as well as significant geological sites at the head of Glen Arroch and the north east coast of Loch Na Dal round into the sound of Sleat.

7.4.82 There are also a number of sites designated for geological, soils or peat interests that are present within 1 km of the study area, outlined below. It is considered that the distance between the Proposed Development and these designated sites provide geographical separation. Therefore, these designated sites are beyond the reach of impact from the Proposed Development and are not considered further within this assessment:

- Loch Ashaig SSSI and GCR site. This 3.3 ha site designated for fossil pine stumps is approximately 700 m downslope from the Proposed Development; and
- Strath SSSI and SAC. An 1,847 ha site designated for geological features and a range of limestone habitats including fen, marsh and swamp habitats. The SSSI / SAC is approximately 500 m up slope from the Proposed Development.

7.4.83 The designated sites are shown on **Figure V2-7.1 Maps 10-12**.

Land Use and Topography

7.4.84 The land use within Section 3 is rural, mainly moorland and forested areas with occasional tracks and roads for woodland maintenance. A number of small streams flow down the northern slopes of Beinne na Grèine, Sgùrr

na Coinnich and Beinn na Callich and other peaks within the Kinloch and Kyleakin Hills into Loch na Beiste and Loch Alsh.

7.4.85 Analysis of mapping indicates that ground elevations within this Section decrease sharply northwards towards the coast. Elevations range from between approximately 30 m AOD near Broadford Substation to in excess of 250 m AOD north of Beinn na Caillich at the eastern part of this Section.

Slope

7.4.86 Section 3 traverses the northern slopes of the Kinloch and Kyleakin Hills. Slope mapping indicates that gradient of the slope varies significantly and ranges from 2 degrees to more than 12 degrees along the route within this Section, with several locations that pass over or intersect areas of slope gradients between 8 to 12 degrees.

Soils

7.4.87 Soil types within the Section 3 study area were identified as follows:

- peat;
- peaty podzols;
- peaty gleys; and
- brown soils.

7.4.88 The majority of soils comprise peaty gleys and brown soils. The Carbon and Peatland 2016 Map identifies the predominant peat classifications as Class 1 and Class 5. Areas of other peat class are also mapped within the study area. Refer to **Figure V2-7.3 (Maps 10 – 12)** for further details.

7.4.89 As part of the baseline assessment a comprehensive peat probing and characterisation exercise has been conducted within the study area for the Proposed Development within Section 3. The peat depths are shown on **Figure V2-7.4**.

7.4.90 A summary of the results relevant to Section 3 is noted below (see also **Appendix V2-7.2** and **Appendix V2-7.3**):

- the presence and depth of peat was assessed at 35 tower locations along the length of the route in Section 3;
- peat was found to be limited along the Proposed Development footprint with the majority being classified as a soil (i.e., less than 0.5 m depth) draped extensively across glacial deposits and bedrock, and dissected by watercourses;
- a total of 14 tower locations have been identified as located within areas of peat (>0.5 m deep) with 9 tower locations identified on peat recorded over 1.0 m deep;
- the overall conclusion regarding peat stability is that there is negligible to low risk of peat instability over most of the Section although some limited areas of medium risk have been identified; and
- a hazard impact assessment has been completed, which has concluded that subject to the employment of appropriate mitigation measures, all these areas can be considered constructable with minimal peat slide risk.

7.4.91 Ground investigation works carried out within Section 3 noted that topsoil was encountered at one location as a silty sandy gravelly clay to a depth of 0.7mbgl.[35] "*Peat was encountered across the route generally on shallow*

[35] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 3 & 3A Broadford to Kylerhea, Geotechnical Interpretative Report, Revision 0

valley sides, plateaus, and valley floors. Peat generally occurred as spongy or plastic slightly sandy fibrous or pseudofibrous peat to a maximum depth of 3.6m bgl. Typically, peat deposits are thinner than 1.00m in thickness across Section 3"[36].

Superficial Geology

7.4.92 The BGS published mapping indicates that the superficial geology present within Section 3 comprises areas of peat, alluvium, till and raised marine deposits, although the majority of the Proposed Development is mapped without superficial deposits indicating that bedrock is at or near surface. The Proposed Development crosses an area of peat and alluvium between Broadford Substation and the B8083, and an area of alluvium and undifferentiated till and morainic deposits south-west of the western shore of Loch na Bèistre. The published superficial geology is illustrated on **Figure V2-7.1 (Maps 10-12)**.

7.4.93 BGS Borehole records indicate that the thickness of superficial deposits in the vicinity of the study area within Section 3 ranges from 0 m to >2 m, comprising glacial deposits overlying the bedrock. Glacial till (diamicton) which is highly variable in composition and may contain lenses of sand and gravel which can support perched water tables. These are likely to be discontinuous and limited in extent and as such can have limited groundwater potential.

7.4.94 The ground investigation encountered raised marine deposits at three locations to a maximum depth of 5.5m bgl. "*Glacial Till occurs across the length of the route generally at the base and side of valleys occurring to a mean depth of 3.05m bgl either from surface or underlying Peat or Topsoil. Glacial Till was recorded at a maximum of 5.90m bgl."*[37]

Bedrock Geology and Linear Features

7.4.95 The Sleat Peninsula and the eastern part of the island comprises Neoproterozoic sedimentary rocks of the Torridon and Sleat groups with Paleaogene igneous intrusions . These units lie to the west of the Moine Thrust, which trends northeast southwest through the Sound of Sleat and the Sleat Peninsula, and have been subject to faulting and folding.

7.4.96 A summary of the published bedrock geology of the site and surrounding area for Section 3 is presented in **Table V2-7.6**. The published bedrock geology is illustrated in **Figure V2-7.2 (Maps 10 -12)**.

Table V2-7-6: Bedrock Geology – Section 3

Age	Stratigraphic Group	Unit	Desctiption
Paleogene (23 – 66 Ma)	North Britain and Central Skye igneous suites	Dykes	Variously: Basalt & microgabbro, felsite and granophyric granite, basaltic andesite and rhyolite, and peridotite.
Mesozoic (Jurassic Hettangian) (c.200 Ma)	Lias Group	Ardnish Formation	Sandstone, siltstone, fissile micaceous mudstone with thin ironstone
		Breakish Formation	Quartzose sandstone, limestone, fissile

[36] Ibid.
[37] Ibid.

Age	Stratigraphic Group	Unit	Desctiption
			mudstone with coral beds
Neoproterozoic (541 – 1000 Ma)	Torridon Group	Applecross Formation	Sandstone with conglomerate
	Sleat Group	Kinlock Formation	Grey sandstone with mudstone
		Beinn na Seamraig Formation	Greenish grey sandstone with mudstone

7.4.97 Numerous north northwest to south south-east trending faults intersect the Lias Group strata, with at least five mapped faults underlying the Proposed Development in Section 3. A further five recorded or inferred faults are mapped within the Neoproterozoic strata. Faulting and seismicity are not known to occur within this area in recent times.

7.4.98 The CGL ground investigation observed variation in the bedrock geology across Section 3. "The Breakish formation, a Jurassic limestone/mudstone can be seen at the western extent of Section 3, … Torridon Group Sandstone is the most prominent strata. To the east a few instances of igneous rocks belonging to the North Britain Palaeogene Dyke Suite are noted."[38] It was noted that the depth to rockhead indicates a natural variation in the deposits.

Mineral Resources

7.4.99 THC has one record of an active quarry within the surrounding area of Section 3: Kyleakin Quarry, to the east of Kyleakin, noted for working sand and gravel.

Radon Gas

7.4.100 The UK Radon Plan indicate that the majority of the study area of Section 3 is located in an area where 1-3% of homes are at or above the NRPB action level therefore the risk of significant ingress of radon into structures on-site is considered low.

Section 4

Designated Sites

7.4.101 The study area of Section 4 contains the following designated sites:

- Druim Losal SSSI and GCR. A 50.6 ha site designated for Lewisian Gneiss rock exposures of the Glenelg Inlier. The north-eastern corner of this SSSI is located on the route of the OHL;
- Glen More GCR. Shown on NatureScot mapping, but no description is provided. A NatureScot research report from 2018[39] recorded the GCR as '*igneous petrology'.* Noted for the major facies of the Ratagain pluton and its importance for understanding plate tectonics of the northwest Highlands.

7.4.102 The designated sites are shown on **Figure V2-7.1 Maps 13-17**.

[38] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 3 & 3A Broadford to Kylerhea, Geotechnical Interpretative Report, Revision 0

[39] NatureScot (2018), available at https://www.nature.scot/sites/default/files/2019-06/Publication%202018%20-%20SNH%20Research%20Report%201014%20-%20Appendix%201%20-%20Site%20codes%20data.xls [accessed on 14 April 2022]

7.4.103 There are also a number of sites designated for geological, soils or peat interests that are present within 1 km of the study area, outlined below. It is considered that the distance between the Proposed Development and these designated sites provide geographical separation. Therefore, these designated sites are beyond the reach of impact from the Proposed Development and are not considered further within this assessment:

- Beinn a' Chapuill SSSI and GCR. A 522 ha site designated for Lewisian Gneiss rock exposures of the Glenelg Inlier. This SSSI is approximately 800 m from the Proposed Development.
- Kinloch Hourn GCR. Shown on NatureScot mapping, but no description is provided. The NatureScot report[40] categorised this GCR for structural and metamorphic geology.

Land Use and Topography

7.4.104 The land use within Section 4 is rural, mainly moorland and forested areas with occasional tracks and roads for woodland maintenance. The route of the Proposed Development rises steeply from Kyle Rhea over forested land around Druim na Leitire. The route then crosses the Glen More river valley before traversing over mountainous terrain towards the east before falling towards Kinlochhourn and Loch Cuaich.

7.4.105 Ground elevations within Section 4 range from sea level at Kyle Rhea and Glen More to approximately 470 m AOD at the watershed between Glen More and Loch Hourn, while elevations along the northern side of Loch Cuaich vary between approximately 220-250 m AOD.

Slope

7.4.106 Section 4 traverses the mountainous regions east of Balvraid. Slope mapping indicates that gradient of the slope varies significantly but the majority of the land records slopes of more than 12 degrees within this Section. Where possible, the Proposed Development has been sited on land ranging from 2 to 8 degrees, although several locations along the route pass over or intersect areas of slope gradients between 8 to >12 degrees.

Soils

7.4.107 Soil types within Section 4 were identified as follows:

- peaty podzols;
- peaty gleys;
- brown soils;
- montane soils; and
- mineral podzols.

7.4.108 The Carbon and Peatland 2016 Map identifies the predominant peat classifications as Class 0 and Class 4. Where peat is present, the majority has been mapped as Class 2 and Class 5. Refer to **Figure V2-7.3 (Maps 13 – 17)** for further details.

7.4.109 Section 4 of the Proposed Development is located along shallow bedrock and glacial till, with little peat present. This was confirmed by the ground investigation work undertaken along the route of the Proposed Development Section 4. A summary of the results relevant to Section 4 is noted below (see also **Appendix V2-7.2** and **Appendix V2-7.3**):

- the presence and depth of peat was assessed during the ground investigation at 163 tower locations and length of the route in Section 4;

[40] Ibid.

- peat was found to be limited but localised along the Proposed Development footprint with the majority being classified as a soil (i.e., less than 0.5 m depth) draped across glacial deposits and bedrock and dissected by watercourses;
- a total of 85 tower locations have been identified as located within areas of peat (>0.5 m deep) with 38 towers recorded on peat over 1.0 m deep and eight towers recorded at locations with peat in excess of 2.5 m deep;
- the overall conclusion regarding peat stability is that there is low to medium risk of peat instability at most of the tower locations, although some areas of high risk have been identified; and
- a hazard impact assessment has been completed, which has concluded that subject to the employment of appropriate mitigation measures, all these areas can be considered constructable with minimal peat slide risk.

7.4.110 Ground investigation works carried out within Section 4 reported that where peat was encountered across the route it was *"generally on shallow valley sides, plateaus, and valley floors. Peat generally occurred as spongy or plastic slightly sandy fibrous or pseudofibrous peat not exceeding a depth to base of 1.00 m bgl."*[41].

Superficial Geology

7.4.111 The BGS published mapping indicates that much of Section 4 is absent of superficial deposits and bedrock is marked at or near the surface. Where present the superficial geology predominately comprise Quaternary age Head, Alluvium, River Terrace deposits, and Glacial Till. The published mapping indicates that the glacial deposits comprise diamicton and sand and gravel. The published superficial geology is illustrated in **Figure V2 7.1 (Maps 13-17)**.

7.4.112 There are no published borehole records within the study area of Section 4. Glacial till (diamicton) which is highly variable in composition and may contain lenses of sand and gravel which can support perched water tables. These are likely to be discontinuous and limited in extent and as such can have limited groundwater potential.

7.4.113 The CGL ground investigation within Section 4 noted that *"… superficial strata across the route vary depending on physical characteristics of the proposed investigation location and the proximity to physical features (e.g., plateaus, rivers etc). There is little spatial association between different superficial deposits*."[42]

7.4.114 Head, Alluvium and River Terrace deposits were encountered at a small number of locations and comprised a range of silty and/or clayey gravelly sands or sandy gravels.

7.4.115 Glacial Till occurs "*across the length of the route generally at the base and side of valleys occurring to a mean depth of 3.00m bgl either from surface or underlying Peat, Alluvium or River Terrace Deposits. At some localities Glacial Till deposits reached depths up to a maximum 15.50m bgl. These were generally encountered as grey or orangish brown slightly clayey and/or slightly silty gravelly sands or sandy gravels*."[43]

Bedrock Geology and Linear Features

7.4.116 The bedrock geology within Section 4, east of the Moine fault, comprises Archaean age basement gneiss inliers (the Lewisian Complex) overlain by younger Morar and Glenfinnian psammites and pelites. The deposits typically follow a west to east younging pattern.

[41] Card Geotechnics Limited (2021) LT91 Fort Augustus to Skye OHL Reinforcement – Section 4: Geotechnical Interpretative Report. Revision 0.
[42] Ibid.
[43] Ibid.

7.4.117 A summary of the published bedrock geology of the site and surrounding area in Section 4 is presented in **Table V2-7.7**. The published bedrock geology is illustrated in **Figure V2-7.2 (Maps 13-17)**.

Table V2-7-7: Bedrock Geology – Section 4

Age	Stratigraphic Group	Unit	Description
Paleogene (23 to 66 Ma)	North Britain Palaeogene Dyke Suite	Dykes	Micrograbbro and basalt, felsite and granophyric granite
Palaeozoic (359 – 444 Ma)	North Britain Siluro-devonian Calc-alkaline Dyke Suite	Dykes	lamprophyre
	Ratagain Plutonic Complex	N/A	Granitic rocks
	Argyll And Northern Highlands Granitic Suite	N/A	Meladiorite, hornblende
Neoproterozoic (541 – 1000 Ma)	Glenfinnan Group	Lochailort Pelite Formation	Psammite, pelite
		Beinn An Tuim Striped Formation	Psammite, pelite, Quartzite
		Easter Glen Quioch Psammite	Psammite, pelite
	Morar Group	Morar Group	Psammite, semipelit and pelite
		Lower Morar Psammite Formation	Psammite, pelite and migmatitic
Proterozoic to Archaean (542 – 4000 Ma)	Lewisian Complex	Loch Duich Gneisses	Marble and calcsilicate-rock.
		Lewisian Complex	Undefined

7.4.118 The study area within Section 4 has records on the BGS mapping of several faults shown at 1:625,000 scale and at 1:50,000 scale that pass beneath the Proposed Development. The faults generally trend in two directions, roughly north-east – south-west and north-west – south-east. Faulting and seismicity are not known to occur within this area in recent times.

7.4.119 The CGL ground investigation noted that in Section 4 "*bedrock deposits typically follow a west to east younging pattern. The Lewisian Gneiss Complex is encountered in the west of the site around Glenelg, which is unconformably overlain by the Morar Group between Glenelg and Kinloch Hourn. The Morar Group is the dominant bedrock group encountered within the western areas of Section 4. A south east trending geological fault around Kinloch Hourn distinguishes the Morar Group from the Glenfinnan Group with the northern side of the fault reflecting the Morar Group and the southern side the Glenfinnan Group. As the route continues south east the Glenfinnan Group is the dominant bedrock group encountered. This is differentiated with intrusions of the Argyll and Northern Highlands Granitic Suite around Loch Quioch at the eastern extent of Section 4*." [44]

[44] Card Geotechnics Limited (2021) LT91 Fort Augustus to Skye OHL Reinforcement – Section 4: Geotechnical Interpretative Report. Revision 0.

Mineral Resources

7.4.120 THC minerals audit of 2015-2016[45] has no records of active quarries within the study area or surrounding areas for Section 4.

Radon Gas

7.4.121 The UK Radon Plan indicates that the majority of the study area of Section 4 is located in an area where less than 1 % of homes are at or above the NRPB action level therefore the risk of significant ingress of radon into structures on-site is considered low.

Section 5

Designated Sites

7.4.122 The study area of Section 5 contains the following designated site:

- Quoich Spillway SSSI and GCR. Located immediately to the east of Loch Quoich dam, the SSSI covers an area of 5.53 ha and is cited for its distinct exposures of 'Quoich granite geniss and its contacts with the Moine meta-sedimentary rocks into which it is intruded'.

7.4.123 The designated site is shown on **Figure V2-7.1 (Maps 17-18)**.

Land Use and Topography

7.4.124 The land use within Section 5 is rural, mainly moorland and forested areas with occasional tracks and roads for woodland maintenance. The Proposed Development route is situated to the north of Loch Garry. A number of small streams flow down the northern slopes into Loch Garry. The settlement of Tomdoun and hamlet of Inchlaggan are situated along the northern bank of Loch Garry. The hamlet of Faichem and village of Invergarry are situated to the east of Loch Garry.

7.4.125 Ground elevations generally decrease southwards towards the lochs. Elevations range from between approximately 240 m AOD to the west of this Section near the dam at Loch Cuaich to 140 m AOD at the proposed CSE Compound to the east of this Section (at the boundary with Section 6). Elevations decrease to approximately 90 m AOD along the northern banks of Loch Garry.

Slope

7.4.126 Section 5 traverses the northern flank of the Loch Garry valley. Slope mapping indicates that gradient of the slope varies significantly and ranges from 2 degrees to more than 12 degrees within the study area of this Section, with several locations that pass over or intersect areas of slope gradients between 8 to >12 degrees.

7.4.127 In November 2018, a large landslide occurred to the north of Loch Quoich Dam (within Section 5). This was a significant landslide at approximately 1 km long, which damaged powerlines to Skye and the Western Isle leading to power outages. In addition, the landslide forced the road to be closed and power station operations to be stopped due to the material deposited across the landscape[46]. Following the landslide, the damaged transmission towers were replaced with New Suite of Transmission Structures (NeSTS) towers.

[45] Highland Council Minerals Audit 2015-2016, available at: https://www.arcgis.com/apps/webappviewer/index.html?id=80b35ea0385a44728b6e4dacc07a4719 [accessed on 22 March 2022]

[46] The Highland Council, 2018, Loch Quoich Landslip update. Available at: https://www.highland.gov.uk/news/article/11500/loch_quoich_landslip_update/ [Last accessed 05 May 2022]

Soils

7.4.128 Soil types within the study area of Section 5 were identified as follows:

- peaty podzols;
- peaty gleys;
- brown soils; and
- mineral podzols.

7.4.129 The Carbon and Peatland 2016 Map identifies the predominant peat classifications as Class 0 and Class 4. Where peat is present the majority has been mapped as Class 2 and Class 5. Refer to **Figure V2-7.3 (Maps 17 – 20)** for further details.

7.4.130 Section 5 of the Proposed Development is located along shallow bedrock and glacial till, with little peat present. This was confirmed by the ground investigation work undertaken along the OHL route across Section 5. A summary of the results relevant to Section 5 is noted below (see also **Appendix V2-7.2** and **Appendix V2-7.3**):

- the presence and depth of peat was assessed during the ground investigation at 95 tower locations and the length of the OHL route in Section 5;
- peat was found to be limited but localised along the Proposed Development footprint with the majority being classified as a soil (i.e., less than 0.5 m depth) draped extensively across glacial deposits and bedrock and dissected by watercourses;
- a total of 30 tower locations have been identified as located within areas of peat (>0.5 m deep) with 15 recorded at locations with peat over 1.0 m deep and one recorded with peat in excess of 2.5 m deep.
- the overall conclusion regarding peat stability is that there is negligible to low risk of peat instability at most of the tower locations, although some areas of medium risk have been identified; and
- a hazard impact assessment has been completed, which has concluded that subject to the employment of appropriate mitigation measures, all these areas can be considered constructable with minimal peat slide risk.

7.4.131 Ground investigation works carried out within Section 5 reported that where peat was encountered across the route it was *"generally on shallow valley sides, plateaus, and valley floors. Peat generally occurred as spongy or plastic slightly sandy fibrous or pseudofibrous peat to a maximum depth of 2.7 m bgl. Typically, peat deposits are thinner than 1.00 m in thickness across Section 5."* [47]

Superficial Geology

7.4.132 The BGS published mapping indicates that the superficial geology present across Section 5 predominately comprises Quaternary age hummocky glacial deposits, isolated pockets of peat and alluvial deposits associated with the River Garry. The published mapping indicates that the hummocky glacial deposits comprise diamicton and sand and gravel, though superficial deposits are absent over the highest ground and bedrock is marked at or near the surface. Isolated pockets of peat occur, coinciding with topographically low-lying areas. The published superficial geology is illustrated in **Figure V2-7.1 Maps 17-20**.

7.4.133 BGS Borehole records indicate that the thickness of superficial deposits in the vicinity of the study area within Section 5 ranges from 1.0 m to 2.7 m, comprising glacial deposits overlying the bedrock. Glacial till (diamicton) which is highly variable in composition and may contain lenses of sand and gravel which can support perched water tables. These are likely to be discontinuous and limited in extent and as such can have limited groundwater potential.

[47] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 5 Quoich to Invergarry: Ground Investigation Report. Revision 1.

7.4.134 The CGL report summarises that *"… superficial strata across the route vary depending on physical characteristics of the proposed investigation location and the proximity to physical features (e.g., plateaus, rivers etc). There is little spatial association between different superficial deposits*." [48] The superficial deposits recorded across Section 5 comprise River Terrace deposits and Glacial Till.

7.4.135 The GCL report notes that *"Made Ground was encountered in the western end of Section 5"* at three tower locations. *"Deposits usually consist of spongy pseudofibrous peat with brick, wood and metal fragments or as silty sandy gravels with brick, wood and metal fragments" [49]:* No visual or olfactory evidence of contamination was noted from the Made Ground deposits, and as such are not considered to be of concern.

7.4.136 River Terrace deposits were encountered at two locations within Section 5 as a thin unit of silt sandy gravels. Glacial Till "*occurs across the length of the route generally at the base and side of valleys occurring to a mean depth of 2.30 m bgl either from surface or underlying Made Ground, Peat or Topsoil*", and generally occurs as "grey or dark orangish brown slightly clayey and / or slightly silty gravelly sands or sandy gravels."[50]

Bedrock Geology and Linear Features

7.4.137 The bedrock geology within the study area of Section 5 between Loch Cuaich and Invergarry comprise the psammites of the Loch Eil Group (Moine Supergroup), which are the predominant geological unit with lithologies of the West Highland Granite Gneiss Intrusion and of the Argyll and Northern Highlands Granitic Suite. The region has been subject to significant metamorphism, thrusting and folding during tectonic and seismic activity during the Ordovician-Silurian Caledonian Orogeny. There are a range of igneous intrusions and dykes intersecting the older meta-sedimentary rocks.

7.4.138 A summary of the published bedrock geology of the site and surrounding area is presented in **Table 8**. The published bedrock geology is illustrated in **Figure V2-7.2 (Maps 17-20)**.

Table V2-7-8: Bedrock Geology - Section 5

Age	Stratigraphic Group	Unit	Description
Palaeozoic (359 – 444 Ma)	Argyll and Northern Highlands Granite Suite	Dykes	Granite, meladiorite, hornblende and microdiorite
	Glen Garry Vein Complex	Veins	Breccia, tuffsite, granodiorite, tiorite, pegmatite and leucogranite
	North Britain Siluro-devonian Calc-alkaline Dyke Suite	Dykes	Microdiorite, microgranodiorite

[48] Ibid.
[49] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 5 Quoich to Invergarry: Ground Investigation Report. Revision 1.
[50] Ibid.

Age	Stratigraphic Group	Unit	Description
	Glen Morriston Vein Complex	Veins	Pegmatite and leucogranite
Neoproterozoic (541 – 1000 Ma)	West Highland Granite Gneiss Intrusion	N/A	Granite, gneissose
	Moine SuperGroup	Loch Eil Group	Micaceous psammite
		Tarvie Psammite Formation	Quartzite
		Upper Garry Psammite Formation	Quartzite

7.4.139 The CGL ground investigation noted "*there is also little variation in the bedrock deposits across Section 5. The predominant geological unit is the Loch Eil Group, which is present between Loch Quioch dam and Invergarry. Igneous intrusions are encountered regularly along the 22 km stretch of the proposed route, with varying lithologies of the West Highland Granite Gneiss Intrusion and lithologies of the Argyll and Northern Highlands Granitic Suite*". [51]

7.4.140 There are no faults recorded that pass beneath the Proposed Development within Section 5.

Mineral Resources

7.4.141 THC has one record of an active quarry within the surrounding area of Section 5: Gleann Laogh Quarry, to the south of Loch Garry, noted for working igneous and metamorphic rock for crushed rock aggregates.

Radon Gas

7.4.142 The UK Radon Plan indicate that the majority of the study area within Section 5 is located in an area where 1-3% of homes are at or above the NRPB action level therefore the risk of significant ingress of radon into structures on-site is considered low.

7.4.143 Particular areas within Section 5 such as Invergarry and the surrounding land, as well as isolated areas along the north of Loch Garry, are indicated to be in bands of elevated radon potential, with the maximum potential noted as 3 – 5 % and 5 – 10 %.

Historical Past Use and Contaminated Land

7.4.144 In addition to the points raised for Section 0, within Section 5 there is no public record of any mining underlying the study area, although the aerial and OS mapping shows a shaft present to the north of Coille Mhorgil, within the study area, some 200 m south of the Proposed Development and existing OHL route. The shaft is centred at British National Grid (BNG) reference NH 10334 01779, although it is unknown what this shaft relates to. It is considered that it poses no significant risk as it is likely to be small scale, with a very limited extent.

[51] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 5 Quoich to Invergarry: Ground Investigation Report. Revision 1.

Section 6

Designated Sites

7.4.145 The study area for Section 6 does not contain any designated sites of relevance to the geology and soils environment.

- There is one site designated for geological, soils or peat interests present within 1 km of the study area; Fort Augusts GCR – NatureScot SiteLink[52] does not record any further information. A NatureScot research report from 2018[53] recorded the GCR category as *'quaternary geology and geomorphology'. 'The landforms and deposits give evidence for geomorphic processes in Loch Ness area.'*

7.4.146 This designated site is shown on **Figure V2-7.1 (Map 21)**.

Land Use and Topography

7.4.147 The land use within Section 6 is mainly rural, public roads, moorland and forested areas with occasional tracks and roads for woodland maintenance. Section 6 is situated to the west of the River Oich and the Caledonian Canal.

7.4.148 Ground elevations generally decrease south-east towards Loch Oich and the River Oich. Elevations range from between approximately 220 m AOD near Lon Mor to 50 m AOD at Fort Augustus Substation. The proposed CSE Compound near Loch Lundie is situated at an elevation of 140 m AOD.

Slope

7.4.149 Section 6 is situated to the west of the River Oich. Slope mapping indicates that within the southern part of the study area within this Section, the gradient of the slope generally ranges from 0 degrees to 4 degrees, with some areas of 4 to 8 degrees. The northern part of the study area in this Section generally appears to be steeper with gradients ranging between 4 to 12 degrees, with isolated areas that intersect areas of slope gradients in excess of 12 degrees.

Soils

7.4.150 Soil types within Section 6 were identified as follows:

- peaty podzols;
- peaty gleys; and
- brown soils.

7.4.151 The majority of soils comprise peaty podzols. The Carbon and Peatland 2016 Map identifies the predominant peat classifications as Class 2 and Class 5. Areas of other peat class are also mapped within the study area. Refer to **Figure V2-7.3 (Maps 20 – 21)** for further details.

7.4.152 As part of the baseline assessment, a comprehensive peat probing and characterisation exercise has been conducted within the study area for the Proposed Development within Section 6. The peat depths are shown on **Figure V2-7.4 (Maps 20-21)**.

[52] NatureScot (2018), available at https://sitelink.nature.scot/map [accessed on 14 April 2022]

[53] NatureScot (2018), available at https://www.nature.scot/sites/default/files/2019-06/Publication%202018%20-%20SNH%20Research%20Report%201014%20-%20Appendix%201%20-%20Site%20codes%20data.xls [accessed on 14 April 2022]

7.4.153 A summary of the results relevant to Section 6 is noted below (see also **Appendix V2-7.2** and **Appendix V2-7.3**):

- the presence and depth of peat was assessed at 664 locations along the full length of the Proposed Development within Section 6;
- peat was found to be limited along the Proposed Development footprint with the majority being classified as a soil (i.e., less than 0.5 m depth) draped extensively across glacial till and bedrock and dissected by watercourses;
- a total of 86 locations have been identified as located within areas of peat (>1.0 m deep) and 23 locations identified within peat over 2.5 m deep;
- the overall conclusion regarding peat stability is that there is negligible to low risk of peat instability over most of the Section although some limited areas of medium risk have been identified; and
- a hazard impact assessment has been completed, which has concluded that subject to the employment of appropriate mitigation measures, all these areas can be considered constructable with minimal peat slide risk.

7.4.154 Ground investigation works carried out within Section 6 reported that *"Topsoil was typically encountered in areas of deforested vegetation or within firebreaks between forests".* Also that *"Topsoil is generally thin surface layer, typically less than 0.50 m in thickness…"* [54]. The ground investigation also noted that *"peat was encountered across the route generally on shallow valley sides, plateaus, and valley floors. Peat generally occurred as spongy or plastic slightly sandy fibrous or pseudofibrous peat". "Typically, peat deposits are thinner than 1.00 m in thickness across Section 6".*[55]

Superficial Geology

7.4.155 The BGS published mapping indicates that the superficial geology present across Section 6 predominately comprises Quaternary age till and hummocky glacial deposits, isolated pockets of peat and alluvial deposits associated with the River Oich. The superficial deposits in the area immediately surrounding Fort Augustus Substation are mapped as glacial sheet deposits. Superficial deposits are absent across the central part of the study area of Section 6, and bedrock is marked at or near the surface. The published superficial geology is illustrated in **Figure V2-7.1 (Maps 20 and 21)**.

7.4.156 The CGL ground investigation noted that *"… superficial strata across the route vary depending on physical characteristics of the proposed investigation location and the proximity to physical features (e.g., plateaus, rivers etc). There is little spatial association between different superficial deposits*." [56]

7.4.157 The superficial deposits recorded across Section 6 comprise River Terrace Deposits and Glacial Till. River Terrace deposits were "*typically found at positions adjacent to rivers and burns. They are often comprised of gravelly sand with a low cobble content and have a typical thickness of less than 1.00 m*.."[57] While Glacial Till deposits were encountered at the base and sides of valleys with a mean depth of 2.0 m bgl, deposits reached up to 7.7 m in thickness and comprised "*grey or dark orangish brown slightly clayey and / or slightly silty gravelly sands or sandy gravels*." [58]

Bedrock Geology and Linear Features

7.4.158 The bedrock geology within Section 6 between Invergarry and Fort Augustus, is similar to that of Section 5. The psammites of the Loch Eil Group (Moine Supergroup) are the predominant geological unit with lithologies of the

[54] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 6: Geotechnical Interpretative Report. Revision 0.
[55] Ibid.
[56] Ibid
[57] Ibid.
[58] Ibid.

West Highland Granite Gneiss Intrusion and of the Argyll and Northern Highlands Granitic Suite. The region has been subject to significant metamorphism, thrusting and folding during tectonic and seismic activity during the Ordovician-Silurian Caledonian Orogeny. There are a range of igneous intrusions and dykes intersecting the older meta-sedimentary rocks.

7.4.159 A summary of the published bedrock geology of the site and surrounding area is presented in **Table 9**. The published bedrock geology is illustrated in **Figure V2-7.2 (Maps 20-21)**.

Table V2-7-9: Bedrock Geology - Section 6

Age	Stratigraphic Group	Unit	Description
Palaeozoic (359 – 444 Ma)	Argyll and Northern Highlands Granite Suite	Dykes	Granite, meladiorite, hornblende and microdiorite
	Glen Garry Vein Complex	Veins	Breccia, tuffsite, granodiorite, tiorite, pegmatite and leucogranite
	North Britain Siluro-devonian Calc-alkaline Dyke Suite	Dykes	Microdiorite, microgranodiorite

7.4.160 The CGL ground investigation noted "*there is also little variation in the bedrock deposits across Section 6. The predominant geological unit is the Loch Eil Group which is present between Invergarry and Auchterawe Substation. Igneous intrusions are encountered regularly along the stretch of the proposed underground cable route, these are of the West Highland Granite Gneiss Intrusion*".[59]

7.4.161 There are no faults recorded beneath the Proposed Development within Section 6. There are however several faults shown to the east of the Proposed Development associated with the Great Glen Fault zone, the major continuous faults trend roughly south-west to north-east.

7.4.162 Faulting and seismicity are known to occur in the wider area close to the Great Glen Fault and there is potential for the weathering of the bedrock to be deep. These ground conditions are assessed and confirmed within the Ground Investigations.

Mineral Resources

7.4.163 THC minerals audit of 2015-2016[60] has no records of active quarries within the study area or surrounding area for Section 6.

Radon Gas

7.4.164 The UK Radon Plan indicate that the majority of the study area of Section 6 is located in an area where 1 – 3 % of homes are at or above the NRPB action level therefore the risk of significant ingress of radon into structures on-site is considered low.

7.4.165 Land surrounding the course of the River Oich and Caledonian Canal from Invergarry to Fort Augustus are indicated to be in bands of elevated radon potential, with the maximum potential noted as 5 – 10 %.

[59] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 6: Geotechnical Interpretative Report. Revision 0.
[60] Highland Council Minerals Audit 2015-2016, available at: https://www.arcgis.com/apps/webappviewer/index.html?id=80b35ea0385a44728b6e4dacc07a4719 [accessed on 22 March 2022]

Summary of Sensitive Geological or Soil Receptors

7.4.166 **Table V2-7-10** outlines the receptors identified as part of the baseline study, and their sensitivity based upon the criteria contained in **Appendix V2-7.1**, together with a description of their sensitivity to potential impacts associated with the Proposed Development. These receptors form the basis of the assessment, and as per the previously introduced methodology, are used in conjunction with an estimate of the magnitude of an effect to determine significance.

Table V2-7-10: Sensitivity of Receptors

Receptor	Sensitivity	Reason for Sensitivity
Soils	Low	Soils are not of noted quality or habitat.
Peat	High	Peat Class 1 and 2 are mapped as present within the study area.
Geology	Negligible	The geological units present within the study area are widespread across this part of Scotland.
Statutory Designated Sites	High	The Proposed Development passes within the vicinity of the following designated sites: Section 0 – An Cleireach SSSI and GCR; Section 1 – Sligachan SAC and SSSI; Section 3 – Mointeach nan Lochan Dubha SAC and SSSI and Kinloch and Kyleakin Hills SAC and SSSI; Section 4 – Druim Losal SSSI and GCR and Glen More GCR; and Section 5 - Quoich Spillway SSSI and GCR.
Mining or quarrying	Negligible	Minimal sources within study area.
Contaminated land	Negligible	Minimal sources within study area.

7.5 Embedded Mitigation

7.5.1 Mitigation has been developed as the project design has evolved. The impact assessment and mitigation process has been iterative and therefore mitigation has been developed for the design to be as specific as possible and as an assumed part of the Proposed Development and associated infrastructure. This process has included, for example, using existing access tracks where possible, and the siting and location of infrastructure to avoid sensitive geological and soil areas, other than where these are unavoidable such as extensive areas of peat.

7.5.2 In addition to the mitigation embodied in the design and routeing of the project, best practice construction measures have also been developed to ensure that disturbance and pollution during construction is avoided. These are detailed below, and the assessment has been undertaken in the knowledge that such measures would be in place.

Good Practice Measures

7.5.3 The Proposed Development will be in accordance with good practice guidance, including UK and Scottish guidance on good practice for construction projects.

7.5.4 A contractual management requirement of the successful Principal Contractor would be the development and implementation of a comprehensive and site-specific Construction Environmental Management Plan (CEMP). This document would detail how the successful Principal Contractor would manage the works in accordance with all commitments and mitigation detailed in the EIA Report, Applicant's General Environmental Management Plans (GEMPs), statutory consents and authorisations, and industry best practise and guidance, including pollution prevention guidance.

7.5.5 The CEMP will also outline measures to ensure that the works minimise the risk to peat, soils and the geological environment. It is expected that the following measures outlined below will be included in the CEMP and would ensure the works are undertaken in accordance with good practice guidance.

Geology, Peat and Soils

7.5.6 A Design and Geotechnical Risk Register will be compiled to include risks relating to peat instability, as this will be beneficial in identifying potential risks that may be involved during construction.

7.5.7 Good construction practice and methodologies to prevent peat instability within areas that contain peat deposits are identified in **Appendix V2-7.2**. These include:

- measures to ensure a well-maintained drainage system, to include the identification and demarcation of zones of sensitive drainage or hydrology in areas of construction;
- minimisation of 'undercutting' of peat slopes, but where this is necessary, a more detailed assessment of the area of concern would be required;
- careful micro-siting of infrastructure including H poles, tower bases, crane hardstandings and cable route within the LoD to minimise effects on the prevailing surface and sub-surface hydrology and geology;
- raising peat stability awareness for construction site staff by incorporating the issue into the Site Induction (e.g. peat instability indicators and good practice);
- introducing a 'Peat Hazard Emergency Plan' to provide instructions for site staff in the event of a peat slide or discovery of peat instability indicators;
- developing methodologies to ensure that degradation and erosion of exposed peat deposits does not occur as the break-up of the peat top mat has significant implications for the morphology, and thus hydrology, of the peat (e.g. minimisation of off-track plant movements within areas of peat);
- developing robust drainage systems that would require minimal maintenance;
- developing drainage systems that would not create areas of concentrated flow or cause over-, or under-saturation of peat habitats;
- the removal and off-site disposal of soils would be avoided where possible and where soils are considered to have a value with regard to habitat (e.g. peat) and agricultural productivity, and where soils are to be used for restoration purposes following construction;
- best practice methods will be followed when soil handling and storage. This will be required in order to preserve soil, structure, texture and avoid compaction within sensitive locations. The principles that will be adopted to manage potential impacts upon soil during construction within the Proposed Development will be set out in the CEMP; and
- vehicle movements on untracked ground would be limited to reduce the impact of construction on surface cover loss and soil compaction and in particular in areas with softer drift deposits / soils (for example areas of peatland) and on steeper slopes (e.g. valley sides).

Geotechnical Stability

- earth cutting along steeper slopes would be avoided where possible to reduce the impact on slope stability. Where required, suitable engineering would be undertaken to ensure the stability of the slope is maintained, including in areas prone to peat slides.

Contaminated Land

- prior to construction works, an assessment would be made by the Principal Contractor as to the potential for contamination based on site specific information regarding potentially contaminated sites;
- where such investigations identify potentially contaminated land, strategies for mitigation or remediation of the land would be developed and agreed with the regulatory authorities (SEPA and the local authorities) and implemented prior to construction in these locations; and
- where previously unidentified contaminated land is encountered during construction, appropriate investigation and remedial measures would be developed and implemented by the Principal Contractor in accordance with relevant legislation and regulatory requirements to prevent pollution of environmental receptors and / or risk to human health.

Underground Cable Installation

- prior to construction, working areas will be demarcated with barriers or fencing and signage.
- prior to construction trench dimensions will be specified and recorded. Any deviation to the specified dimensions will be reviewed with the design team;
- temporary relatively shallow excavations should be supported with sheet piles or trench sheeting or be battered back to a temporary slope angle of 35 degrees except in peat;
- excavated materials of different types will be stored separately; such as peat, topsoil, subsoil and rock;
- the amount of ground exposed, and time period during which it is exposed, would be kept to a minimum to protect the quality and integrity of the peat and soils;
- trench excavations will be filled with an agreed sand base to be tested for any adverse effects. Once the testing has been approved, the remaining excavation will be backfilled with arisings in reverse order. Any excess natural soil will be spread on the surface in the vicinity of the excavation, or disposed from site; and
- where dewatering is required within the trench, pumping will take place in line with best practice measures described within **Volume 2, Chapter 6: Water Environment** and the CEMP.

Temporary Access Tracks

- In general, proposed construction site access would be taken via the existing public road network and would make use of existing forest and estate tracks as far as practicable, upgraded as required.
- The majority of access will be achieved through upgrade of existing and installation of new tracks. Floating stone road or trackway panel construction may be installed in sensitive areas such as over deeper areas of peat. All new tracks would be constructed in accordance with best practice construction methods, and with reference to NatureScot's good practice guide on constructing tracks in Scottish uplands[61].

Pollution Prevention

- water would be prevented as far as possible, from entering excavations such as cable trenches and foundations;
- procedures would be adhered to for storage of fuels and other potentially contaminative materials in line with the Controlled Activity Regulations, to minimise the potential for accidental spillage; and

[61] Constructed Tracks in the Scottish Uplands. Scottish Natural Heritage, September 2015.

- a plan for dealing with spillage incidents would be designed prior to construction, and this would be adhered to should any incident occur, reducing the effect as far as practicable. This would be included in the final CEMP for the Proposed Development.

7.5.8 A wet weather protocol would be developed. This would detail the procedures to be adopted by all site staff during periods of heavy rainfall. Toolbox talks would be given to engineering / construction / supervising personnel. Roles would be assigned and the inspection and maintenance regimes of soils and erosion control measures would be adopted during these periods.

7.5.9 In extreme cases, the above protocol would dictate that work onsite may have to be temporarily suspended until weather / ground conditions allow.

7.6 Assessment of Likely Significant Effects

The assessment of effects is based on the Proposed Development description outlined in **Volume 1, Chapter 3: Project Description**, and **Volume 2: Chapter 2: Section by Section Overview.**

7.6.1 Potential impacts on geology and the soils environment have been considered for the different phases of the Proposed Development (construction, operation and dismantling). The impacts have been identified with reference to relevant guidance, through consultation and project team discussions, through targeted research on geology, peat and soil effects and by considering the information provided by the project engineers on infrastructure and construction methods.

Construction effects of the Proposed Development

7.6.2 Site clearance and preparation works for installation of the Proposed Development has the potential to result in the following effects without appropriate controls or mitigation:

- over compaction of soils caused by the use of heavy machinery onsite;
- structural deterioration of soil materials during excavation, soil handling, storage and replacement;
- erosion and loss of soils during soil handling, storage and replacement;
- disturbance and loss of deposits of peat;
- ground instability (including peat slide risk) and contamination;
- impact to sensitive geological receptors (e.g., SSSI's); and
- an adverse effect on geological setting from pollution, fuel, oil, concrete or other hazardous substances;

<u>Designated Sites in proximity to the Proposed Development</u>

7.6.3 There are several designated sites associated with the geology and soils environment within the study area. The presence of the Proposed Development within a designated geological site has the potential to damage or have an adverse impact to the features of the designated site.

7.6.4 The Proposed Development within Section 0 crosses the southernmost area of the An Cleireach SSSI and GCR for a length of approximately 500 m. The overall designated site covers an area of 64.81 ha and the majority lies to the north beyond the LoD and would remain undisturbed by the Proposed Development. Careful site design and siting of the H pole locations to avoid rocky outcrops and features of potential interest, would ensure that negligible change from baseline conditions would occur as a result of the Proposed Development in relation to the SSSI / GCR.

7.6.5 Control of working areas and marking out of the designated site would be employed to avoid disturbance to these areas from construction plant and activities. The controls which would be adopted at site in accordance

with best practice would ensure that the potential magnitude of impact on the designated SSSI / GCR is negligible and thus the significance of effect is **Negligible**. No additional mitigation is required.

7.6.6 Within the study area of Section 1 is the designated site Sligachan SAC and SSSI, containing blanket bogs and peat related landscape features. Although there is no infrastructure associated with the Proposed Development within the SAC / SSSI, a new permanent access track and a new CSE Compound at the juncture between Section 1 and Section 2 would be constructed to the east of the SAC / SSSI. The SAC / SSSI's eastern boundary lies to the south of the A87, and therefore the Proposed Development and SAC / SSSI are geographically separated by the A87. This separation would ensure that negligible change from baseline conditions would occur as a result of the Proposed Development in relation to the SAC / SSSI.

7.6.7 The controls which would be adopted at site in accordance with best practice would ensure that the potential magnitude of impact on the designated SSSI is negligible and thus the significance of effect is **Negligible**. No additional mitigation, over and above best practice, is required.

7.6.8 The Proposed Development within Section 3 crosses the most northern part of the Mointeach nan Lochain Dubha SAC / SSSI, although no infrastructure is proposed within the designated site. A new temporary access track is proposed approximately 12 m north of the designated site.

7.6.9 The controls which would be adopted at site in accordance with best practice would ensure that the potential magnitude of impact on the designated site is negligible and thus the significance of effect is **Negligible**. No additional mitigation, over and above best practice, is required.

7.6.10 Approximately 4 km of the Proposed Development within Section 3 crosses the Kinloch and Kyleakin Hills SAC and SSSI. The Proposed Development involves the construction of 24 tower locations, new temporary and permanent access tracks, and the dismantling of the existing OHL within the SAC / SSSI boundary. The two areas of key geological importance found within the SSSI are situated at the head of Glen Arroch and following the north-east coast of Loch na Dal round into the Sound of Sleat. Neither of these geological features is located within the study area.

7.6.11 The controls which would be adopted at site in accordance with best practice would ensure that the potential magnitude of impact on the designated site is negligible in terms of the geology and soils environment, and thus the significance of effect is **Negligible**. No additional mitigation, over and above best practice, is required.

7.6.12 The Proposed Development within Section 4 crosses the Druim Losal SSSI and GCR, which is cited as a 50.6 ha site designated for Lewisian Gneiss rock exposures of the Glenelg Inlier. The Proposed Development involves the construction of two new tower locations on the north-east boundary of the designated site and the dismantling of the existing OHL. In addition, the existing access track present in the western part of the designated site and along the southern boundary would be upgraded.

7.6.13 The Proposed Development would pass through a small section of the Druim Losal site. A significant section of the exposure and key features are located to the south of the Proposed Development. Careful site design and siting of tower locations and access track to avoid rocky outcrops and features of potential interest would ensure that negligible change from baseline conditions would occur as a result of the Proposed Development in relation to the SSSI / GCR. With appropriate controls in accordance with best practice, the significance of effect is **Negligible**.

7.6.14 An existing access track is located to the north of the proposed OHL route within Section 4 which passes through the Glen More GCR roughly trending north – south. There are no proposed changes to this track. No change from the baseline conditions would occur as a result of the Proposed Development. With appropriate controls in accordance with best practice, the significance of effect is **Negligible**.

7.6.15 Within Section 5, the Quoich Spillway SSSI and GCR is located immediately to the south of the Proposed Development within the study area. However, there is no infrastructure associated with the Proposed Development within the SSSI / GCR and therefore no change from the baseline conditions would occur as a result of the Proposed Development. With appropriate controls in accordance with best practice, the significance of effect is **Negligible**.

Soils

7.6.16 During the construction phase there is potential from the siting of site infrastructure for the degradation, removal or loss of soils. The construction methodology chosen ensures that the direct impacts on soil resulting from excavation will be limited spatially to the Proposed Development and temporally to a one-off process of excavation, storage and replacement.

7.6.17 The sensitivity of the soil across the Proposed Development is rated as low. The magnitude of impact is considered negligible due to the careful micro-siting that has occurred during the design evolution stages of the project and, therefore, the significance of effect to potential soil receptors is assessed as **Negligible**. No additional mitigation, over and above best practice, is required.

Peat

7.6.18 The presence of peat within the study area formed a key consideration in the design of the Proposed Development. A peat management plan and detailed review of potential peat slide risk and appropriate mitigation is presented in **Appendices V2-7.2 and V2-7.3**

7.6.19 A peat probing exercise at over 5,800 locations across the Proposed Development, and specifically at 854 tower or H pole locations in areas of identified peaty soil/peat, was used to determine the thickness thereof. The assessment identified a total of 153 tower or H pole locations located within areas of peat (>1.0 m deep) with only 22 locations located within peat over 2.5 m deep. The site design has avoided these deeper areas of peat where technically possible.

7.6.20 There is very limited erosion to peat as a consequence of fluvial activity, grazing or natural movement, although locally in particular around Broadford there is evidence of peat cutting. Peat has been proven to be virtually absent from the hill tops locally and on steeper hills sides.

7.6.21 The Proposed Development has been assessed for potential hazards associated with peat instability. The tower and H pole locations were screened to assess risk, 25 sites were deemed medium risk and only 9 sites identified as high risk. The high risk sites should be assessed prior to construction by a qualified geotechnical engineer. The remainder of sites were deemed to be suitable for mitigation by construction design.

7.6.22 Ground investigation has proven that the majority of the excavated peat to be fibrous and thus readily handled and suitable for storage and re-use on site. Proposals for the re-use and management of peat on site have been outlined in **Appendix V2-7.3.**

7.6.23 The overall conclusion regarding peat stability is that there is negligible to low risk of peat instability over the majority of the Proposed Development although limited areas of medium and high risk have been identified. Subject to the employment of appropriate mitigation measures, all these areas can be considered constructable with minimal peat slide risk, as the area impacted by construction will be very limited, extent of excavation small and in most instances the peat will be used to restore the site.

7.6.24 Rated as a high sensitivity receptor. With the safeguards referred to in **Appendices V2-7.2** and **V2-7.3**, the potential magnitude of impact on peat across the Proposed Development is negligible and, therefore, the

significance of effect is assessed as **Negligible**. No additional mitigation, over and above best practice, is required.

Mineral Resource

7.6.25 At the present time no mineral safeguarding plans have been formulated by THC within the study area, therefore the superficial and bedrock geology within the study area are not recorded as safeguarded minerals. The reduction in extent of these deposits as a result of the construction activities is considered to be negligible because of their widespread occurrence in the region and the country, and therefore minimal percentage loss.

7.6.26 In general, aggregate products are only cost effective if transported over relatively short distances, and thus in order to make extraction viable, there must be a source of demand near-by. The low value of construction aggregates and the high cost of transport is such that the distance to market is critical in defining market values and viability of production sites.

7.6.27 Existing quarries and historical gravel pits appear to be directly adjacent to the existing transport infrastructure and the local potential sales market. Much of the Proposed Development is sited in a rural locality and is some distance from the towns and cities that would have a demand for local aggregate. Furthermore, there is an absence of infrastructure for transporting or processing of any potential mineral deposits.

7.6.28 The potential minerals resources are therefore considered to be of negligible sensitivity. The potential magnitude of impact on the mineral resource is negligible and, therefore, the significance of effect is assessed as **Negligible**. No additional mitigation, over and above best practice, is required.

Geotechnical and Ground Stability

7.6.29 The potential presence of peat and ground stability within the study area formed a key consideration in the design of the Proposed Development. Informed by the extensive programme of peat probing and ground investigation undertaken across the site, the design has avoided areas of deeper peat, where possible.

7.6.30 A detailed review of potential peat slide risk and appropriate mitigation is presented in **Appendices V2-7.2 and V2-7.3.**

7.6.31 Site conditions have been assessed for the proposed H pole and tower locations as part of the detailed project design. In regard to slope stability, slopes characterised by steep gradients and / or loosely consolidated superficial deposits are considered to represent a low baseline sensitivity. Key effects may include localised slippage and increased erosion.

7.6.32 The 2018 landslide near the Qouich Dam in Section 5 indicates this area is subject to slope instability. However, with the embedded mitigation and good practice measures as part of the design, it is considered that the magnitude of impact would be negligible.

7.6.33 Mining is considered to represent a negligible baseline sensitivity. Information from ongoing geotechnical site investigations would be used by the Principal Contractor to design the H pole and tower foundations appropriately.

7.6.34 The magnitude of impact on geotechnical aspects and ground stability is considered negligible due to the careful micro-siting that has occurred during the site design and with the safeguards referred to in **Appendix V2-7.2** and **V2-7.3.** Therefore, the significance of effect to potential instability is assessed as **Negligible** and requires no further mitigation.

Contaminated Land

7.6.35 Information from site walkovers and consultation indicates that contaminated land is unlikely to be encountered along the majority of the study area. The incurrence of contaminated land is predicted to be minor but ground conditions for each H pole, tower location underground cable route and CSE Compound would be assessed by the Principal Contractor as part of the detailed project design. Enabling works and construction would take place in accordance with current legislation and best practice.

7.6.36 Made Ground deposits were identified during ground investigation works within Section 5 and confined to three tower locations. No visual or olfactory evidence of contamination was noted from Made Ground deposits, and as such are considered typical of construction activities occurring in this area. [62]

7.6.37 The controls which would be adopted at site in accordance with best practice would ensure that the potential magnitude of impact on contaminated land is considered negligible. Therefore, the significance of effect to potential instability is assessed as **Negligible** and requires no further mitigation.

Operational effects of the Proposed Development

7.6.38 During the operation of the Proposed Development, it is anticipated that routine maintenance of infrastructure would be required. It is not anticipated that there would be any excavation or need to stockpile large volumes of soils or peat, reducing the potential effects on soils or ground stability. Should any excavation be required, this is likely to be limited. Any excavation, handling and placement of material would be subject to the same safeguards that would be used during the construction phase of the project.

7.6.39 Should any maintenance be required onsite which would involve construction activities, mitigation measures would be adhered to along with the measures in the CEMP to avoid potential effects.

Effects of Dismantling the Existing OHL

7.6.40 All dismantling works would be carried out in accordance with industry best practice construction measures, guidance and legislation.

7.6.41 The existing H pole OHL dismantling would require access by tracked vehicles to each pole location, making use of existing access tracks where practicable. Wood pole foundations are made up of the poles themselves plus some additional steel and timber below ground level. The extraction method for these is to dig down, remove the poles and backfill.

7.6.42 The dismantling of the existing steel towers s would typically require access by tracked vehicles utilising existing access tracks where practicable. Construction equipment would be fitted with standard embedded spill prevention systems and mitigation measures will be applied to prevent spills of oils, hydrocarbons and other contaminants by providing spill response equipment.

7.6.43 The dismantling of the tower foundations would involve excavation below ground level where access can be achieved. Foundation material would be safely removed offsite for disposal. The dismantling would not result in the requirement to dispose of, or import, significant volumes of soils (including topsoil and subsoil) as part of the Proposed Development. Any excavations associated with the tower locations would be backfilled with arisings in reverse order. Any excess natural soil would be spread on the surface in the vicinity of the excavation.

7.6.44 The dismantling plan is described in detail within **Appendix V1-3.8**.

[62] Card Geotechnics Limited (2022) LT91 Fort Augustus to Skye OHL Reinforcement – Section 5 Quoich to Invergarry: Ground Investigation Report. Revision 1.

7.6.45 The dismantling of the existing OHL is not likely to result in significant adverse effects on the geology and soils environment, subject to the implementation of a CEMP, with appropriate safeguards for pollution prevention, and similar to those adopted for construction of the Proposed Development.

7.7 Mitigation

7.7.1 As there are no predicted significant effects under the terms of the EIA Regulations, other than the good practice measures that the Applicant would implement as standard (and as described above), no specific mitigation, during construction, is required.

7.8 Residual Effects

7.8.1 Existing ground conditions have been identified and used to assess the potential impacts the Proposed Development might have on the geology and soils environment. No significant effects are predicted on the geology or soils environment receptors during the construction and operation of the Proposed Development as well as dismantling of the existing OHL.

7.8.2 Best practice construction techniques that would safeguard the geology and soils environment and would be incorporated in the detailed design of the works, have been identified.

7.9 Summary of Effects

7.9.1 A summary of effects and the proposed mitigation measures that are required to reduce such effects are identified in **Table V2-7-11**.

Table V2-7-11: Summary of Effects and Proposed Mitigation Measures

Potential effect	Proposed mitigation/ enhancements	Significance of residual effect
Construction Phase		
• Soil compaction and erosion • Peat erosion or instability • Adverse effect on geological designated sites • Adverse effect on ground stability • Adverse effects on contaminated land	• Mitigation by design • Good practice construction techniques	Negligible
Operation		
No additional effects or mitigation / enhancement identified.		