GREEN VOLT

# Green Volt Offshore Windfarm

## Onshore Environmental Impact Assessment Report

Volume 3

GREEN VOLT

# Appendix 1.1

## Initial Scoping Report

Onshore EIA Report: Volume 3

# Green Volt Offshore Windfarm – Onshore Infrastructure

EIA Scoping Report

**Client:** Green Volt Offshore Wind Ltd
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**Report Prepared for:**
Green Volt Offshore Wind Ltd

**Author:**
Green Cat Renewables Ltd

GLM Ecology

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# Preface

This Scoping Report has been prepared in order to support a request for a formal Scoping Opinion in relation to the onshore elements of the proposed Green Volt Offshore Windfarm from Aberdeenshire Council and Consultees. The Applicant, Green Volt Offshore Wind Ltd (Green Volt), intends to submit separate consents, licences and permissions for the offshore (below Mean High Water Springs (MHWS)) and onshore (above Mean Low Water Springs (MLWS)) infrastructure of the project. A separate offshore scoping report has been prepared for the offshore infrastructure.

Green Volt Offshore Windfarm is being proposed as the first major step towards the goals of the UK North Sea Transition Deal, a sector deal between the oil and gas industry and UK government, signed in March 2021. This Deal recognises that oil and gas will continue to play an essential role in our energy supply as part of the transition towards Net Zero and that it is, therefore critical, to reduce the CO2 emissions generated by offshore oil and gas production from the earliest possible time point, with a minimum reduction of 50% by 2030.

To be operational by 2026, Green Volt offers the opportunity to mitigate 500,000 tonnes of CO2 per year and fully electrify Buzzard, one of the UK's largest oil and gas assets. The opportunity is being evaluated in partnership with CNOOC Petroleum Europe Ltd (CPEL), the operator and largest shareholder in the Buzzard field and would enable removal of the offshore power station, which currently fuels oil and gas production from the field. With a dedicated grid connection, Green Volt Offshore Windfarm would also provide renewable energy to Scotland for decades to come and accelerate Scotland's path towards being a global leader in floating wind capability by creating the world's largest offshore floating windfarm. Green Volt is proposing the development of the Green Volt Offshore windfarm on a brownfield site previously hosting the Ettrick and Blackbird oil field, 75 km east of the Aberdeenshire coast. The development will supply power to the Buzzard oil field and the National Grid, making landfall near Peterhead.

This Scoping Report considers all onshore infrastructure required to facilitate the connection of the offshore elements of the windfarm, notably:

- Cable Landing/Jointing Pit;
- Cable Route between Landing point and grid connection point at New Deer; and
- A new substation at New Deer.

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# 1 Introduction

## 1.1 Overview

1. This submission consists of a request for a Screening Opinion under Regulation 8 of the same regulations and a Scoping Opinion under Regulation 17 of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.
2. The Scoping Request has been prepared by Green Cat Renewables (GCR) on behalf of Flotation Energy Ltd, hereafter referred to as 'the Applicant'. For the purposes of this Scoping Report, the Proposed Development would comprise the onshore infrastructure associated with the proposed Green Volt project from MHWS. The Green Volt project aims to install a 300MW floating wind farm on the decommissioned Ettrick / Blackbird oil and gas fields in the North Sea by 2026. The Green Volt project will provide renewable electricity to power the operations of the Buzzard oil field, one of the largest oil and gas developments on the UK continental shelf and provide surplus renewable electricity to the UK grid as part of the North Sea electrification programme outlined in the North Sea Transmission deal.
3. To facilitate the connection of the wind farm to the national grid, a new buried export cable will be required to connect the development at the offshore / onshore interface to a new substation at New Deer, approximately 25km west of Peterhead (the 'Proposed Development ').
4. Options for an appropriate landing point for the offshore cable and associated infrastructure are being investigated along with the cable route from each of the landing points back to a new substation at New Deer. These options form the basis for the Scoping Exercise.
5. A separate EIA scoping exercise is being progressed in respect of offshore elements of the Project ("the offshore works"). Responsibility for that scoping response lies with Marine Scotland.
6. Figures accompanying this scoping report are presented in Appendix A.

## 1.2 The Applicant

7. Green Volt Offshore windfarm is being developed by Green Volt Offshore Windfarm Ltd (herein referred to as Green Volt), a new company formed by Flotation Energy Plc (FE) and CNOOC Petroleum Europe Ltd (CPEL). The project proposes to develop a floating offshore windfarm to facilitate a first of its kind decarbonisation of the Oil and Gas industry through the complete electrification of the Buzzard oil and gas field (operated by CPEL) with the support of a fully connected UK grid connection back to the New Deer substation in Aberdeenshire.
8. Flotation Energy is an offshore wind development company, headquartered in Edinburgh, UK. Founded in 2018, the company is pioneering the deployment of both floating and fixed offshore wind in the UK and Internationally. Flotation Energy's UK projects include:
    - Green Volt Offshore Floating windfarm (this development)
    - Morecambe Offshore Windfarm (480 MW offshore wind, awarded as part of the England and Wales Round 4 auction)
    - White Cross floating windfarm (100 MW offshore wind, south-west England)
9. The company is also active in Europe and Internationally, with a total offshore wind development pipeline of over 10-Gigawatt (GW) capacity.
10. CNOOC Petroleum Europe Ltd (CPEL) is the operator of the Buzzard, Golden Eagle and Scott platforms. CPEL is also the largest shareholder in the Buzzard oil field and is seeking to maximize the value of its existing

portfolio, while creating new opportunities for global growth. CPEL fully supports the transition to Net Zero and the UK North Sea Transition Deal and recognises the importance of reducing the carbon intensity of UK oil and gas. As a shareholder in Green Volt, CPEL will work with Flotation Energy to deliver the windfarm in the rapid timescale required by the North Sea Transition Deal.

## 1.3 The Agent

11. GCR Green Cat Renewables Ltd has been commissioned to prepare this report. GCR is an environmental and engineering consultancy focused on all aspects of development support, based in Scotland. With a team of 60 staff spread across three offices, the company's multi-disciplinary resource base spans all stages of project delivery from feasibility and concept development through to planning, engineering, project management and operational asset management. While much of the company's experience is within the renewable sector, GCR's emphasis is on supporting farmers, landowners and developers in a wide range of renewable projects. GCR have also developed expertise in helping a range of businesses find sustainable energy solutions to aid economic viability in a climate where energy costs are forecast to continue to rise.
12. The GCR EIA team brings a diverse skill set that includes planning, environmental and technical expertise, and is comprised of Project Managers, planners, consultants, environmentalists, engineers, acousticians, CAD technicians, GIS technicians, hydrologists and resource analysts.

## 1.4 Purpose of the Scoping Report

13. The purpose of this report is to formally request the Screening and Scoping Opinions of Aberdeenshire Council as a planning authority, and other stakeholders in accordance with the Town and Country Planning (Environmental Impact Assessment (Scotland) Regulations 2017. The assessments undertaken, as outlined within this report, will be presented in an Environmental Impact Assessment (EIA) Report, which will be submitted to the council in support of a full planning application.
14. The scoping report has been prepared as the initial stage of the EIA process in support of a formal request for a scoping opinion from Aberdeenshire Council, under regulation 17 of the EIA Regulations.
15. As outlined in Regulation 17(2) this report includes:
    - A description of the location of the development, including a plan sufficient to identify the land;
    - A brief description of the nature and purpose of the development and of its likely significant effects on the environment; and
    - Such other information or representations as the developer may wish to provide or make.
16. This report has been produced in line with these requirements.
17. The EIA process must identify and assess, in an appropriate manner, in light of the circumstances relating to the Proposed Development, the direct and indirect significant effects of the Proposed Development on a number of factors and the interaction between these factors (Regulation 4(2) and (3)). These factors under the 2017 Regulations are:
    - Population and human health;
    - Biodiversity, and in particular species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
    - Land, soil, water, air and climate;
    - Material assets, cultural heritage and the landscape.

    The purpose of the scoping report is to:

- Identify the key areas to be considered as part of the EIA;
- Identify areas which can be scoped out of the EIA or which do not require to be addressed in greater detail; and
- Review activities which may give rise to potential significant environmental impacts during the lifecycle of the development.

18. This scoping report outlines the proposed approach to the assessment of environmental impacts and the proposed EIA Report content, for approval with Aberdeenshire Council and other Statutory Consultees. A number of questions to assist in the focus of the overall EIA scope are included at the end of each section.
19. The Applicant has appointed an EIA project team to provide the relevant assessment, advice, and reporting to support the delivery of the EIA. The appointed team have the necessary experience and qualifications to carry out the assessments.

## 1.5 Phasing of Information Provided

20. The Development Management Procedures[1] indicates that the information required for proposals to be assessed should be:
    - Necessary to inform the decision;
    - Relevant to the development proposal; and
    - Proportionate to the scale and complexity of likely impacts arising and are clearly scoped to avoid unnecessary costs.

    It also indicates that the information submitted should be:
    - Focussed;
    - Fit for purpose; and
    - Clear in its findings.
21. The level of information provided will be commensurate with the stage of the development. A progression is anticipated between the high-level scoping stage, site specific details for the planning application stage and detailed technical stage for the discharge of conditions.
22. Given the scale of the Proposed Development, it is anticipated that a robust set of controlling conditions will be attached to any consent to ensure appropriate environmental protections. It is expected that a Construction Method Statement will be produced, containing an Environmental Management Plan, Water Management Plan, Access Management Plan, Landscape Mitigation Plan and a Surface Water Management Plan.

[1] The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013

# 2 Proposed Development

## 2.1 Introduction

1. To facilitate the connection of the offshore wind farm to the national grid, a new buried cable will be required to connect the development to a new substation at New Deer, approximately 25km west of Peterhead. The wind farm will be connected to the onshore work package via a joint bay (underground), where the offshore cables will be brought onshore and connected to the onshore works.
2. This connection will also facilitate the supply of power to offshore platforms during periods of down time or inactivity from the wind farm.
3. The proposed cable corridor is generally 50m in width centred on the cable route The main high voltage underground cables have capacity to transmit 300 megawatts ('MW') of electricity. Note for the purposes of this scoping report, the corridor width is 100m.
4. Two search areas for an appropriate landing point for the offshore cable and associated infrastructure are being investigated, along with a number of options for the cable run from each of the landing points to the substation at New Deer. All of these options form the basis for the Scoping Exercise. During the scoping phase a final point of connection and route will be selected for the final EIA submission.
5. Preliminary constraints mapping of the jointing bays, route options and substation locations are shown in Figures 2.1a to 2.1d.

## 2.2 The Need for the Proposed Development

6. Green Volt Offshore Windfarm is being proposed as the first major step towards the goals of the UK North Sea Transition Deal, a sector deal between the oil and gas industry and UK government, signed in March 2021. This Deal recognises that oil and gas will continue to play an essential role in our energy supply as part of the transition towards Net Zero and that it is, therefore critical, to reduce the CO2 emissions generated by offshore oil and gas production from the earliest possible time point, with a minimum reduction of 50% by 2030.
7. To be operational by 2026, Green Volt offers the opportunity to mitigate 500,000 tonnes of CO2 per year and fully electrify Buzzard, one of the UK's largest oil and gas assets. The opportunity is being evaluated in partnership with CNOOC Petroleum Europe Ltd (CPEL), the operator and largest shareholder in the Buzzard field and would enable removal of the offshore power station, which currently fuels oil and gas production from the field. With a dedicated grid connection, Green Volt Offshore Windfarm would also provide renewable energy to Scotland for decades to come and accelerate Scotland's path towards being a global leader in floating wind capability by creating the world's largest offshore floating windfarm. Green Volt is proposing the development of the Green Volt Offshore windfarm on a brownfield site previously hosting the Ettrick and Blackbird oil field, 75 km east of the Aberdeenshire coast. One export cable would supply the Buzzard oil field 15 km away, whilst a second export cable would supply the National Grid, via the onshore connection to New Deer.
8. The Proposed Development is supported by a framework of international, UK and Scottish climate change and renewable energy policies. These policies are material considerations which will be reviewed in the EIA report.
9. The Proposed Development supports the recently published Crown Estate Scotland leasing process for offshore wind farms to help decarbonise Scotland's oil and gas sector (Innovation and Targeted Oil and Gas Decarbonisation– INTOG leasing round) and the associated INTOG sectoral marine plan that is currently in the

public consultation phase which is being managed by Marine Scotland and the Scottish Government[2]. This aims to provide the mechanism to support the North Sea Transition Deal[3] and the decarbonisation of oil and gas installations in the North Sea by 50% by 2030.

10. National Planning Framework 3 (NPF3) (2014) is a strategy setting out plans for development and investment in infrastructure by the Scottish Government over the next 25 years. It is supported by Scottish Planning Policy (SPP) which includes policies on renewable energy and acknowledges Scotland's offshore renewable energy resources. NPF3 acknowledges the deployment of offshore renewables will become increasingly important in Aberdeen and the north-east and that there is a desire for Scotland to become a world leader in offshore renewable energy. There is recognition that focusing on enhancing the high voltage transmission network supports this and will help to facilitate offshore renewable energy developments.
11. The Climate Change (Emissions Reduction Target) (Scotland) Act 2019 provides targets for a reduction in greenhouse gas emissions. It includes the net-zero emissions target year of 2045.
12. The Scottish Energy Strategy: The Future of Energy in Scotland (Scottish Government, 2017) sets out the Scottish Government 2050 vision for energy in Scotland. One of the visions includes renewable solutions, specifically championing Scotland's renewable energy resources and their ability to support energy targets.
13. The Scottish Government published a Climate Change Plan (CCP) in February 2018 which set out how Scotland could deliver a climate change target of emissions reductions (66% relative to baseline for 2018-2032). With regards to electricity, the CPP notes that; *"By 2032, Scotland's electricity system will supply a growing share of Scotland's energy needs and by 2030, 50% of all Scotland's energy needs will come from renewables"*.
14. The Scottish Government, along with many others across the world, declared a climate emergency in 2019, outlining the need for swift and decisive action to limit the warming of the planet by 1.5 degrees compared to 1990 levels.

## 2.3 The Required Onshore Infrastructure

15. Two option search areas were identified to investigate suitability for an appropriate landing point for the offshore cable and associated infrastructure. As well as the landing point for the cable, a number of development corridors to facilitate the cable connection from the onshore/offshore landing point back to the substation at New Deer are also considered as part of the scoping exercise. All of these options form the basis for the Scoping Exercise.
16. The Proposed Development consists of electrical cables and a new substation to be installed as well as a small number of temporary work elements required as part of the installation process, as follows:
    - Joint bays (underground);
    - Electrical cables installed in a single trench;
    - Temporary working area alongside trench;
    - Temporary storage and welfare compounds that move along the cable route;
    - Temporary compounds associated with Horizontal Directional Drilling (HDD) that move along the route; and
    - A new substation with temporary storage and welfare compound.

[2] Marine Scotland Sectoral plan for offshore wind INTOG - https://marine.gov.scot/data/sectoral-marine-plan-offshore-wind-innovation-and-targeted-oil-and-gas-decarbonisation-intog
[3] North Sea Transition Deal – BEIS https://www.gov.uk/government/publications/north-sea-transition-deal

17. The new substation will comprise of Gas Insulated Switchgear (GIS) substation on a site approximately 170 m by 185 m.
18. The cable will comprise 3 single core 33,000-volt cross-linked polyethylene (XLPE) cables, copper earth strip (50 mm2 or greater. The cables will be buried for the entire length of the route in a trench excavated to 1.5 m depth and approximately 3m in width, except where they are ducted under watercourses or roads.
19. At the end of each cable drum, a joint bay is required which allows each length of cable to be jointed to the next. The joint bay will be excavated 1.5 m deep max, 2 m x 2 m in area.
20. An area extending 10 m alongside the trench will be required as a temporary working area. On the opposite side a 4 m area for temporary storage of spoil materials prior to reinstatement will also be required.
21. During the installation phase of the project there will be two temporary compounds housing a skip container (approx. 2 m x 3 m), a welfare unit (approx. 6 m x 3 m) and the cable drums (approx. 2 m in diameter and 1.5 m in width). There will be approximately 20 drums stored at any one time. It is not anticipated that hardstanding is required to provide a suitable and level working platform. Following completion of the cable route the facilities will be removed and the area returned to its original use.
22. Additional smaller temporary compounds will be required at the locations where HDD activities are proposed to take place. These are described in Section 3.5.2.

## 2.4 The Proposed Offshore Development

23. An offshore wind farm of nominal capacity 300MW is proposed above the Ettrick and Blackbird oil fields, which are in their final stages of decommissioning in 2021/2 and will have been fully removed prior to Green Volt construction. The offshore wind farm will include 20-25 floating wind turbines, associated mooring structures, mooring chains, a single offshore station and inter array cables.
24. The offshore substation will provide the marshalling point for the offshore wind turbine inter array cables. It will provide the required voltage conversion transformers to enable export of electricity to the Buzzard facility at [33kV] and to the High Voltage (HV) offshore export cable (back to shore). The substation will also provide relevant metering of power to/from Buzzard and to/from the onshore grid connection point.
25. An offshore export cable (approx. 80km) will connect the offshore substation to a jointing bay, to be located on land and within 500m of the Aberdeenshire coastline.

## 2.5 Grid Connection Process

26. The Proposed Development is required to connect the offshore wind farm to the national electricity grid, for the export of electricity generated as well as providing import power from the national electricity network to the operations of the Buzzard oil field. The electrical grid connection does not form part of the planning application for the Proposed Development.
27. A new Bilateral Connection Agreement (BCA) to provide 300MW Export and 60MW Demand. The onshore connection point will be New Deer 400kV Substation. The offer for connection to, and for use of the National Electricity Transmission System at Green Volt offshore substation (formerly Whirlwind) is made based on the Connect and Manage Arrangements, and on the basis of the Offshore Transmission System Development User Works (OTSDUW) Arrangements.

## 2.6 Landing Points

28. The interface point for the offshore/onshore cabling is required to be sited in close proximity to the coastline, this is to allow for to cable ducting to be sited in an appropriate depth of water to allow the installation team

to carry out works safely. Two search areas were identified by the offshore team as suitable for further investigation.

### 2.6.1 North Peterhead

29. A number of potential option areas have been identified to the north of Peterhead, located on the eastern side of the A90, between the main road and the coastline. These option areas are shown on **Figure 2.1c.**

### 2.6.2 Peterhead and South

30. **Figure 2.1d** shows the landing point options under consideration to the west and south of Peterhead. This also includes the potential to tie in with the North Connect cable landing point. Early discussions have been held regarding the use of this area.

## 2.7 Cable Corridors

31. Once the cable is landed and connected onshore, it is required to connect with the national electricity network. The location of the connection specified by SSE Transmission (SHET) is at the New Deer Substation.

32. A preliminary options appraisal process was undertaken to identify preferred site and route options for the landing point (landfall) for the subsea cables on the coastline, the underground cable connection from the landfall to the proposed substation site and the proposed substation site.

33. The detailed site and routeing appraisal considering environmental constraints, technical and economic feasibility, and deliverability will continue throughout the EIA process.

34. **Figure 2.7** provides a high-level overview of the proposed locations for the landing points, cable routes and substations. These elements comprise the scoping boundary for the purpose of this report, and it is anticipated that the planning application boundary around the cable will be approximately 100m wide in order to accommodate a working area for the construction phase of the project.

## 2.8 Construction Phase

### 2.8.1 Construction Environmental Management Plan

35. A draft Construction Environmental Management Plan (CEMP) will accompany the planning application. The CEMP sets out the general approach of environmental management and mitigation of impacts associated with the construction works. The appointed Construction Contractor will update and finalise the CEMP and will be responsible for ensuring that any adverse effects from the construction phase are minimised.

### 2.8.2 Cables

36. Cable installation will be undertaken via the excavation of a trench to facilitate the installation of the cables. The cables will be surrounded by stabilised backfill material and protected with warning tape above them. Excavated soil material will be used to back-fill the excavation, with the excess material spread in the immediate proximity to the excavation or removed from site.

37. The cable installation works will likely take place within a 50m wide excavation corridor accommodating working area, excavated soils and the cable trenches. The cables will be installed using methodology suited to the existing land use although it is anticipated at this stage that open cut trenching will be used for the majority of the cable length and horizontal directional drilling as an alternative to cross significant constraints such as watercourses and roads.

### 2.8.3 Jointing Bay

38. The marine cables will be connected to the land cables in a jointing bay buried in the ground. This location will be a temporary construction compound and will likely require topsoil stripping and shallow excavation. HDD cable ducts will be installed, and the HDD will drill seaward, installing the ducts for cables. The cables will be pulled inland from a marine vessel which will be located offshore as close to land as possible. The final size of the jointing bay will be approximately 10m by 10m.
39. Once the cables are installed, the ground will be reinstated and there will be no above ground infrastructure left in position. A temporary haul road will likely be required.

### 2.8.4 Substation

40. The proposed substation will be located in agricultural land approximately 6km south-east of New Deer and approximately 1km south of the New Deer Substation which, at the time of reporting, is under construction.
41. The proposed substation will be a Gas Insulated Switchgear (GIS) substation. The site will be approximately 170 m by 185 m and will connect into the existing adjacent 400kV overhead lines. A temporary construction compound will be required adjacent to the site. Existing overhead lines and underground cables will require some amendments to connect them into the new substation.

## 2.9 Operational Phase

42. Following completion of the works, the substation will be unmanned and will be visited intermittently for monitoring and maintenance. Maintenance works will be required during the lifetime of the substation. The underground cables will be routinely assessed to ensure safety clearances are maintained.

## 2.10 Decommissioning Phase

43. The lifespan of a substation is approximately 50 years although there is the potential for to extend this with maintenance. Once expired, the materials would be recycled and it is anticipated that foundations would be removed and shallow soils reinstated.
44. It is assumed that the substation will be removed approximately 50 years. Similarly, underground cables have a life expectancy of approximately 50 years at which point they would remain buried in the ground. For assessment purposes, the EIA will assume that the cables would remain in situ at the end of their life.

# 3 EIA Methodology

## 3.1 Introduction

1. EIA is a statutory process governed by UK and retained EU (European Union) law. It is a means of drawing together in a systematic way an assessment of the likely significant environmental effects arising from a Proposed Development. In Scotland, the relevant regulations are provided in The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.
2. This section presents an overview of the methodology to be utilised for the production of the EIA. It outlines the methodology for the identification and evaluation of potential likely significant environmental effects and presents the methodology for the identification and evaluation of potential cumulative and any inter-related impacts.
3. To ensure that the information is presented in a structured and consistent way in each topic, the assessments will be presented broadly as outlined below:
   - Introduction: Identifies key objectives and issues;
   - Guidance: Summarises the relevant policy and guidance documents used to inform the assessment;
   - Methodology: Summarises the methods used in undertaking the assessment work;
   - Baseline: Summarises the existing situation;
   - Assessment of Predicted Impacts and Effects: Identifies and assesses the predicted effects (both positive and negative) associated with the construction, operation and decommissioning of the Development;
   - Mitigation: Summarises measures envisaged to avoid, reduce or remedy predicted negative effects of the Development;
   - Summary of Predicted Impacts and Effects: Summarises impacts and effects predicted and proposed mitigation measures
   - Conclusion: Summarises the conclusions of the assessment

## 3.2 Assessment Methodology

4. The individual methodologies for assessing each EIA topic area will be described in more detail in each of the individual chapters of the EIA Report. The following sections briefly outline the overarching assessment methodology to be undertaken.

### 3.2.1 Identification of Environmental Baseline

5. A review of the current environmental conditions will be undertaken to determine the appropriate baseline for assessment. In the majority of assessments this will involve the following:
   - Definition of an appropriate study area, based on guidance and best practice;
   - A review of currently available information relating to the development study area;
   - Identification of likely or potential impacts;
   - Outline further data/survey/monitoring required to obtain relevant information if required to support assessment;
   - Review information to ensure sufficient data is available to provide a robust assessment.

### 3.2.2 Assessment of Impacts

6. The Applicant has appointed a competent team of EIA specialists who will undertake the required assessments using available data, new data (if required), professional and expert judgement.
7. The methods for predicting the nature and magnitude of any potential impacts vary dependent on the subject area. Quantitative methods of assessment can predict values that can be compared against published thresholds and indicative criteria in Government guidance and standards. Where it is not possible to use a quantitative method, a qualitative assessment method will be utilised, these assessments rely on the experience and professional judgement of the technical specialist.
8. The potential significant effects of development must be considered in relation to the characteristics of development and the location of development, with regard to the impact of the development on the factors specified in Regulation 3A (3), considering:
   - The magnitude and special extent of the impact (for example geographical area and size of the population likely to be affected);
   - The nature of the impact;
   - The intensity and complexity of the impact;
   - The probability of the impact;
   - The expected onset, duration, frequency and reversibility of the impact;
   - Cumulative impacts with the impact of other existing and/or approved development; and
   - The possibility of effectively reducing the impact.
9. Table 3.1 illustrates how the criteria will be applied to ascertain the level of significance of a potential impact.

**Table 3.1 - Significance of effect matrix**

| Sensitivity | Magnitude of Change | | | |
|---|---|---|---|---|
| | High | Medium | Low | Negligible |
| **High** | Major | Major/Moderate | Moderate | Moderate/Minor |
| **Medium** | Major/Moderate | Moderate | Moderate/Minor | Minor |
| **Low** | Moderate | Moderate/Minor | Minor | Minor |
| **Key:** | | Significant in terms of the EIA Regulations | | |

## 3.3 Mitigation

10. The aim of the EIA is to avoid, reduce and offset any significant adverse environmental effects arising from the Proposed Development.
11. Where possible, reasonable steps will be taken during the design process to avoid the creation of significant or adverse impacts. Where these cannot be avoided completely, appropriate mitigation will be proposed to avoid or reduce the impacts to acceptable levels.

## 3.4 Conclusion and Residual Effects

12. The conclusion will summarise the key findings of the assessment and outline any residual effects which remain following the assessment and appropriate mitigation process and whether these are acceptable in EIA terms.

## 3.5 Structure and Content of the EIA Report

13. It is expected that the EIAR will be structured as below:

- Introduction & Background
- The Proposed Development
- Design Statement
- Planning Statement
- Landscape and Visual Impact Assessment
- Archaeology and Cultural Heritage
- Hydrology and Hydrogeology
- Ecology
- Ornithology
- Air Quality
- Other Issues
- Summary of Mitigation
  - Landscape & Visual Impact Assessment Figures
  - Planning Drawings & Technical Figures
  - Non-Technical Summary

# 4 Planning Policy

## 4.1 Introduction

1. The Proposed Development relates to the installation of an underground cable and ancillary infrastructure to connect the Green Volt Offshore Wind Farm with substation infrastructure at New Deer, Aberdeenshire to the cable landing location where the marine cable joins to the onshore cable. The forthcoming planning application will include a planning statement that appraises the Proposed Development against the Development Plan and other material planning considerations. Note: a separate offshore EIA will be submitted to Marine Scotland to cover all elements of the project up to mean high water spring (MHWS).
2. By the nature of the Proposed Development, being underground for the vast majority of the length of the cable, the potential for environmental impacts is most likely during the construction phase of the development – the underground sections of the Proposed Development will not generate emissions or additional traffic and will not be visible within the wider area once operational. As such, while planning applications should be commensurate with the scale of the Proposed Development, they should also be commensurate with scale of potential environmental impacts. The planning application submission will be reflective of that balance.

## 4.2 The Statutory Development Plan and Non-Statutory Guidance

3. The planning policy context applicable to the site will be taken into account within the iterative design process. The site is wholly within the Aberdeenshire Council area and, therefore, the applicable Development Plan for the site comprises the Aberdeen City and Shire Structure Plan 2009 (ACSSP) and the Aberdeenshire Local Development Plan 2017 (LDP 2017). The Aberdeenshire Proposed Local Development Plan 2020 (LDP 2020) has been published but not yet adopted, however, it should be given material weight in the planning balance. The key considerations arising from the Development Plan for this development are considered to be:

### 4.2.1 ACSSP

4. The structure plan includes a vision that aims to develop the economy, maintain and improve the quality of the environment and provide a high quality of life up to 2030. The plan contains no policies but the forthcoming Planning Statement will contain an appraisal of the vision, spatial strategy and objectives of the plan and how they relate to the Proposed Development.
5. It is noted that the ACSSP highlights electricity grid reinforcement in the wider area of the Proposed Development  The Proposed Development would tie in with wider energy infrastructure development in the area.

### 4.2.2 LDP 2017

- The site is wholly within the Buchan area as outlined in the plan.
- Policy B1 Employment and business land
- Policy R1 Special rural areas
- Policy R2 Housing and employment development elsewhere in the countryside
- Policy P1 Layout, siting and design
- Policy P4 Hazardous and potentially polluting developments and contaminated land
- Policy E1 Natural heritage
- Policy E2 Landscape

- Policy HE1 Protecting historic buildings, sites, and monuments
- Policy HE2 Protecting historic and cultural areas
- Policy PR1 Protecting important resources
- Policy PR2 Protecting important development sites
- Policy C2 Renewable energy
- Policy C4 Flooding
- Policy RD1 Providing suitable services

#### 4.2.3 LDP 2020

- Policy R1 Special Rural Areas (Coastal Zone)
- Policy R2 Development Proposals Elsewhere in the Countryside (brownfield site route preference)
- Policy P1 Layout, Siting and Design
- Policy E1 Natural Heritage
- Policy E2 Landscape
- Policy E3 Forestry and Woodland
- Policy HE1 Protecting Listed Buildings, Scheduled Monuments and Archaeological Sites (including other historic buildings)
- Policy PR1 Protecting Important Resources
- Policy PR2 Reserving and Protecting Important Development Sites (route selection)
- Policy PR3 Reuse, Recycling and Waste (construction activities and decommissioning)
- Policy C2 Renewable Energy (associated infrastructure)
- Policy C3 Carbon Sinks and Stores
- Policy C4 Flooding
- Policy RD1 Providing Suitable Services (surface water and construction waste management)

6. All guidance documents are regarded as material considerations. A Planning Statement will be provided with the application which will contain an assessment of the accordance of the Proposed Development with the relevant policy and guidance documents as referred to above.

## 4.3 Other Material Considerations

7. Reference will be made to various national planning policy and guidance documents including:
   - The National Planning Policy Framework 3 (NPF3);
   - The Interim 'Position' Statement on NPF 4;
   - Scottish Planning Policy (SPP); and
   - Scottish Government web-based Renewables Guidance.

### 4.3.1 The Need for Renewable Energy and the Renewable Energy Framework

8. The clear objectives of the UK and Scottish Governments will be summarised, in relation to encouraging increased deployment and application of renewable energy technologies, consistent with sustainable development policy principles and national and international obligations on climate change.
9. On 27th June 2019, a new legally binding target to reach net zero greenhouse gas emissions by 2050 came into UK law. By 2050, the UK will need an ultra-low carbon power sector to meet this economy wide net zero emissions target. In parallel, generation will need to increase to meet future demand and to achieve this it is estimated that low carbon electricity generation will need to quadruple by 2050.
10. At a Scottish Government level, a "Climate Emergency" was declared by the First Minister in April 2019. Furthermore, the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 sets a legally binding 'net zero' target for Scotland for 2045 (with challenging binding interim targets), five years ahead of the date set for the whole of the UK.
11. Reference will be made to the clear objective of the Scottish Government to encourage increased deployment and application of renewable energy technologies, consistent with sustainable development policy principles and national and international obligations on climate change.
12. The Proposed Development would clearly contribute to the attainment of renewable energy, electricity and climate change targets at both the Scottish and UK levels and the quantification of this contribution would be described in the forthcoming planning application. The description of the renewable energy policy framework will also refer to the Scottish Government's Climate Change Plan Update (December 2020), The Scottish Energy Strategy (2017) and Onshore Wind Policy Statement (2017).
13. As an essential part of the infrastructure required for a large-scale renewable energy source, it is anticipated that the Proposed Development would be afforded additional positive material weight in the planning balance.

## 4.4 Permitted Development Rights

14. Green Cat Renewables Ltd is not a statutory undertaker for the purposes of The Town and Country Planning (General Permitted Development) (Scotland) Order 1992 (as amended) (GPDO). It is recognised that other organisations that are statutory undertakers benefit from significant permitted development rights for electricity undertakings under Class 40 of the GPDO, subject to prior approval. While the existence or not of permitted development rights is not material, it perhaps suggests that the nature of the Proposed Development warrants focussed assessment.

## 4.5 Key Questions for Council and Consultees

15. Q4/1: Can the Council confirm if there are any other current or emerging policy or guidance documents that have not been identified above?
16. Q4/2: Can the Council confirm if there are any other key policies that should be considered as part of the planning appraisal in the forthcoming planning application?

# 5 Landscape and Visual Impact

## 5.1 Introduction

1. The development will consist of underground cabling and ancillary infrastructure, including a substation and landing point. The Proposed Development will potentially have a direct impact on the physical characteristics of the landscape as well as indirect impacts through the visual presence of the substation on the character of the landscape and other visual receptors in the area.
2. Currently, there are several route options and substation location options under consideration, following scoping inputs and along with the other environmental considerations, a final route with the least impact and disruption to the landscape and landscape and visual resource will be selected.

## 5.2 Guidance

3. The methodology for the LVIA and the Cumulative Landscape and Visual Impact Assessment (CLVIA) has been undertaken in accordance with the methodology set out below and conforms to, *The Guidelines for Landscape and Visual Impact Assessment*, Third Edition (Landscape Institute and IEMA, 2013). Additional guidance has been taken from the following publications:
   - National Programme of Landscape Character Assessment: Banff and Buchan, NatureScot Review No. 37, Cobham Resource Consultants, 1997;
   - Landscape Character Assessment: Guidance for England and Scotland (Countryside Agency and NatureScot publication, produced by the University of Sheffield and Landuse Consultants), 2002;
   - Residential Visual Amenity Assessment, Technical Guidance Note 2/19, Landscape Institute, March 2019; and
   - Constructed Tracks in the Scottish Uplands, 2nd Edition, NatureScot, September 2015.

## 5.3 Consultation

4. Aberdeenshire Council and NatureScot will be consulted with regards to the scope of the LVIA, including, the requirement for any visualisations required to assist the assessment.

## 5.4 Methodology

### 5.4.1 Defining the Study Area

5. An overall study area of 1km buffer from the centre of each of the route options is proposed based on professional experience.

### 5.4.2 Zone of Theoretical Visibility

6. A Zone of Theoretical Visibility (ZTV) will be considered for each of the substation options, illustrating the visual influence of the buildings. The ZTV, however, does not take account of built development and vegetation, which can significantly reduce the area and extent of actual visibility in the field and as such provides the limits of the visual assessment study area.

### 5.4.3 Baseline Landscape and Visual Resource

7. This part of the LVIA will refer to the existing landscape character, quality or condition and value of the landscape and landscape elements on the site and within the surrounding area, as well as general trends in landscape change across the study area. A brief description of the existing landscape character and land use of the area which includes reference to settlements, transport routes, vegetation cover, as well as landscape planning designations, local landmarks, and tourist destinations.

### 5.4.4 Assessing Landscape Effects

8. Landscape Effects are defined by the Landscape Institute as "*changes to landscape elements, characteristics, character, and qualities of the landscape as a result of development*". The potential landscape effects, occurring during the construction and operation period, may therefore include, but are not restricted to, the following:

   - Changes to landscape elements: the addition of new elements or the removal of trees, vegetation, and buildings and other characteristic elements of the landscape character type;
   - Changes to landscape quality: degradation or erosion of landscape elements and patterns, particularly those that form characteristic elements of landscape character types;
   - Changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities and the cumulative addition of new features, the magnitude of which is sufficient to alter the overall landscape character type of a particular area; and
   - Cumulative landscape effects: where more than one wind farm may lead to a potential landscape effect.

9. The development may have a direct (physical) effect on the landscape as well as an indirect effect or effect perceived from out with the landscape character area. Landscape effects will be assessed by considering the sensitivity of the landscape against the degree of change posed by the development. The sensitivity of the landscape to the development is based on factors such as its quality and value and is defined as high, medium or low. Examples of landscape sensitivity and criteria are described below:

   - High Sensitivity – This would primarily be rare landscapes, or landscapes which have been afforded either a national or local designation such as National Parks, National Scenic Areas or Areas of Landscape Significance. These landscapes can be fairly dramatic in terms of scale and may feature a number of attractive landscape features, including mature woodland, intricate gorges and river valleys, prominent summits or features of cultural heritage. Man-made features or modifications to the landscape will be minimal and the landscape may have a wild or remote feeling to it;
   - Medium Sensitivity – This would include landscapes which are still relatively attractive and generally rural but do contain some man-made elements. It may be landscapes which have been modified to accommodate farming practices and landscapes which include more prominent settlement pattern and road networks. These landscapes may also contain woodland including plantation forestry and shelterbelts; and
   - Low Sensitivity – This would only be reserved for landscapes which may be deemed unattractive due to heavy modification and prominent man-made features, such as industrial units.

10. The magnitude or degree of change considers the scale and extent of the Proposed Development , which may include the loss or addition of particular features, and changes to landscape quality, and character. Magnitude can be defined as high, medium, low or negligible, examples of magnitude are shown below:

    - High Magnitude – This would be a major change to baseline conditions, where the character of the landscape may be altered from its existing state;

- **Medium Magnitude –** This would be a noticeable change in the baseline condition but not necessarily one which would be enough to alter the character of the landscape and will generally diminish with distance;
- **Low Magnitude –** This would be a minor change to the baseline conditions where the development would be readily missed by a casual viewer and any character of the landscape would remain intact; and
- **Negligible Magnitude –** This would be a change which would be difficult to notice and the baseline conditions are likely to remain almost as they were.

11. The level of effect is determined by the combination of sensitivity and magnitude of change as shown in **Table 3.1.**
12. The significance of any identified landscape or visual effect will be assessed in terms of Major, Major/Moderate, Moderate, Moderate/Minor, Minor or Minor/Negligible. These categories have been based on combining viewer or landscape sensitivity and predicted magnitude of change. The matrices should not be used as a prescriptive tool but will allow for the exercise of professional judgement.
13. Any effects that are classified as Major or Major/Moderate, will be considered to be equivalent to likely significant effects referred to in the EIA Regulations. Careful consideration will also be given to Moderate effects to test whether (in the professional opinion of the landscape architect) they are significant in EIA terms or not. In all cases, whether an effect is significant or not is confirmed within the assessment.

### 5.4.5 Assessing Visual Effects

14. Visual effects are recognised by the Landscape Institute as a subset of landscape effects and are concerned wholly with the effect of the development on views, and the general visual amenity. The visual effects are identified for different receptors (people) who will experience the view at their places of residence, during recreational activities, at work, or when travelling through the area. These may include:
    - Visual effect: a change to an existing view, views or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view; and
    - Cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect. Either:
        - Simultaneously - where a number of developments may be viewed from a single fixed viewpoint simultaneously within the viewer's field of view without moving;
        - Successively- where a number of developments may be viewed from a single viewpoint successively by turning around at a viewpoint, to view in other directions; and
        - Sequentially- where a number of developments may be viewed sequentially or repeatedly from a range of locations when travelling along a route.
15. The general principles adopted for the assessment of visual effects were taken from *The Guidelines for Landscape and Visual Impact Assessment* Third Edition, produced by the Landscape Institute, 2013. This guidance outlines the approach to define the 'sensitivity' for a given view and a 'magnitude of change' that would be caused by the development in question over its lifetime. A matrix in the Guidance is then used to assess the overall 'level of effect'. This matrix is the same format as used to understand landscape effects and can be seen in **Table 3.1** Examples of visual sensitivity are highlighted below:
    - **High Sensitivity –** These include residential receptors, such as views from individual properties or views from within settlements. Views from both recreational locations, such as hill summits, long distance footpaths, cycle paths and tourist locations such as castles and visitor centres are also considered to be of high sensitivity;

- **Medium Sensitivity –** This would include most other visual receptors such as views from roads, other areas of landscape which would not be classed as recreational areas and views from areas within settlements which would not be considered residential; and
- **Low Sensitivity –** This would cover views experienced by people at work and views where the existing view is already dominated by significant man-made features.

16. In the context of this project, the effects during operation are always direct and long term. Effects may also be non-cumulative or cumulative. None of the visual effects relating to this project have been considered positive in order to present a worst-case view of any effects.

### 5.4.6 Visual Assessment of Residential Properties

17. A residential amenity assessment for all dwellings inside 1km of the final substation location will be carried out. This will include assessing the impact on the dwelling house, the environs including any driveways or access tracks but not including views from upper floor windows. The assessment may be accompanied by photomontages where appropriate. The *Residential Visual Amenity Assessment*, Landscape Institute, 2019 will be used when conducting this part of the assessment.

### 5.4.7 Predicting Cumulative Landscape Effects

18. The assessment will consider the extent to which the Proposed Development, in combination with other substations, may change landscape character through either incremental effect on characteristic elements, landscape patterns and quality, or by the overall cumulative addition of new features. Identified cumulative landscape effects are described in relation to each individual Landscape Character Area and for any designated landscape areas that exist within the study area.

### 5.4.8 Predicting Cumulative Visual Effects

19. The assessment of cumulative visual effects involves reference to the cumulative visibility ZTV maps and the cumulative viewpoint analysis. Cumulative visibility maps may be used to analyse and identify the residential and recreational locations and travel routes where cumulative visual effects on receptors (people) may occur as a result of the Proposed Development, in this case the substation building. The cumulative visual study will focus on the impact the proposed substation will contribute to cumulative impacts when similar electricity infrastructure is considered.

## 5.5 Baseline

### 5.5.1 Landscape Character

20. The site is located across a number of different landscape character types (LCTs) and will have a direct impact on any which it crosses. There may be some indirect effects on neighbouring LCTs, however given the buried nature of the development this would be unlikely. A detailed assessment of both the direct and indirect impacts on any LCTs within the study area will be key to the LVIA. Each of the LCTs within the study areas are identified below.

**Table 5.1 – Potential impact on Landscape Character Types**

| Landscape Character Area | Potential Impact |
|---|---|
| **Banff and Buchan Landscape Character Assessment** | |
| Dunes, Beaches and Links | Direct and Indirect Impact |
| Fragmented Rocky Coast | Direct and Indirect Impact |
| Coastal Agricultural Plain | Direct and Indirect Impact |

| | |
|---|---|
| Farmland and Wooded Policies | Direct and Indirect Impact |
| Undulating Agricultural Heartlands | Direct and Indirect Impact |
| Farmed Straths | Indirect Impact |
| Farmed Rolling Ridges and Hills | Indirect Impact |

### 5.5.2 Landscape Designations

21. Part of the development site is located within the Aberdeenshire Coast Special Landscape Area (SLA) as such it will have some direct impacts as a result of the development as well as indirect effects across the designation. This SLA covers the coastal landscapes between Fraserburgh and Peterhead, and the LVIA will include a detailed assessment of the impact the Proposed Development will have on the special qualities which comprise the SLA. All landscape designations are listed in the table below.

**Table 5.2 – Potential impact on Designated Landscape**

| Landscape Designation | Potential Impact |
|---|---|
| **Aberdeenshire Local Plan** | |
| Aberdeenshire Coast Special Landscape Area | Route options 2 and 4 both begin within this designation. Options 1 and 3 would have no impact on this designation. |

22. An assessment of this landscape designation which is predicted to be impacted by the Proposed Development will be undertaken as part of the LVIA. All other landscape designations, including GDLs, will be scoped out of the LVIA due to there being no direct impacts and the limited visual influence of the Proposed Development

### 5.5.3 Landscape Mitigation and Reinstatement

23. During the trenching of the cable route, any turves will be stored appropriately, vegetated side up, and in piles of not more than two deep. Topsoil will be stored adjacent but separate. The working corridor will be kept to a minimum and any dry-stone dykes or fences removed, will be fully restored.

24. A planting plan will be proposed at the chosen substation which will be specific to the predicted visual impact, with the planting designed to mitigate views from key residential receptors, as well as soften edges and allow the development to blend into the landscape.

## 5.6 Summary

25. The Proposed Development may give rise to some significant effects in terms particularly to direct impacts on the landscape character and, while indirect impact will be considerably less, there is some potential that sections of the development such as the substation could cause indirect impacts on the landscape character.

26. It may also have significant effects on visual receptors, including residents, road users, hill walkers and visitors to the area, this is likely to only be as a result of the impact of the substation. As such, a detailed assessment will be undertaken through an LVIA, which will include accompanying maps and visualisations.

## 5.7 Key Questions for Council and Consultees

- Q5/1 Do the Council and consultees agree with the proposed methodology?

Q5/2 Are the Council or consultees aware of any further guidance or policy documents not mentioned within the report that are relevant to the assessment?

# 6 Ecology

1. Input into the Scoping Report has been prepared by GLM Ecology. A Desktop Study Ecology Appraisal prepared by GLM Ecology dated September 2021 is included as **Appendix B**.

## 6.1 Baseline

2. The ecology chapter will consider the potential impacts of the Proposed Development on the ecological features (non-avian) present within the site. The chapter will contain a summary of the methods used to establish the baseline conditions within the site and its surroundings, the results of the baseline surveys, and the process used to determine the sensitivity of the habitats and species' populations present. The ways in which habitats or species might be affected (directly or indirectly) by the construction and operation of the Proposed Development will be assessed, prior to and after any mitigation measures are considered. In addition, any cumulative effects will be considered, taking together impacts of other development projects in the area, whether operational, consented or at application stage, along with the significance of any predicted effects of the Proposed Development.
3. All ecology personnel working on the project are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and have extensive experience of cable routes, building developments, solar farms and wind developments. The assessment of effects presented within the EIA Report will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (2018)[4] . The included updates within the Good Practice Guidance for Habitats and Species (2021)[5] will be utilised along with the BS42020 Biodiversity – Codes of Practice for Planning and Development.

## 6.2 Guidance

### 6.2.1 Ecology Legislation

4. The ecology assessment will be carried out in accordance with the principles contained within the following European legislation:
   - European Union Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora;
   - European Union Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy ("Water Framework Directive"); and
   - Environmental Impact Assessment Directive 2014/52/EU.
5. The following national legislation will be considered as part of the ecology assessment:
   - The Wildlife and Countryside Act 1981 (as amended);
   - The Protection of Badgers Act 1992;
   - The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (''The Habitats Regulations'');
   - The Water Environment and Water Services (Scotland) Act 2003 (WEWS);
   - The Nature Conservation (Scotland) Act 2004 (as amended);

[4] Guidelines for Ecological Impact Assessment (EcIA) CIEEM, 2018, https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/
[5] Good Practice Guidance for Habitats and Species version 3, May 2021, https://cieem.net/wp-content/uploads/2021/05/Good-Practice-Guide-April-2021-v6.pdf

- The Water Environment (Controlled Activities) (Scotland) Regulations 2011;
- The Wildlife and Natural Environment (Scotland) Act 2011; and
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

### 6.2.2 Ecology Guidance

6. The ecology assessment will be carried out in accordance with the principles contained within the following guidance documents:
   - CIEEM (2018). Guidelines for ecological impact assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (2nd Edition);
   - Collins, J. (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust;
   - Historic Environment Scotland and Scottish Natural Heritage (2018). Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland;
   - Hundt, L. (2012). Bat Surveys: Good Practice Guidelines (2nd edition). Bat Conservation Trust;
   - Joint Nature Conservation Committee (2013). Guidelines for selection of biological Sites of Special Scientific Interest (SSSI);
   - Scottish Executive (2017). Planning Circular 1/2017: Environmental Impact Assessment regulations
   - Scottish Executive Environmental Assessment6;
   - Scottish Executive (2019). Scotland's Forestry Strategy (2019-2029)7
   - Scottish Executive Rural Affairs Department (SERAD) (2000). Habitats and Birds Directives, Nature Conservation: Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the Conservation of Wild Birds (''The Habitats and Birds Directives''). Revised Guidance Updating Scottish Office Circular No 6/1995;
   - Scottish Government (2001). European Protected Species, Development Sites and the Planning Systems: Interim guidance for local authorities on licensing arrangements;
   - Scottish Government (2010). Management of Carbon-Rich Soils;
   - Scottish Government (2016). Draft Peatland and Energy Policy Statement;
   - Scottish Government (2017). Draft Climate Change Plan-the draft Third Report on Policies and Proposals 2017-2032;
   - SEPA (2017). Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems;

[6] Scottish Executive (2017). Planning Circular 1/2017 (https://www.gov.scot/publications/planning-circular-1-2017-environmental-impact-assessment-regulations-2017/) (accessed October 2021)

[7] Scotland's Forestry Strategy 2019–2029 (https://www.gov.scot/publications/scotlands-forestry-strategy-20192029/ ) (accessed October 2021)

## 6.3 Survey Methodologies and Assessment

### 6.3.1 Habitat Survey

7. A Phase 1 Habitat Survey, in accordance with the Joint Nature Conservation Committee (JNCC) Methodology 2010 (updated 2016)[8], will be conducted and will include searches for scarce or rare plants.
8. To ensure the collation of complete and current baseline habitat information, a targeted National Vegetation Classification (NVC) survey will be undertaken for the whole site, within the optimum survey window (May to September) following the industry standard survey methodology (Rodwell, 2006).

### 6.3.2 Ground Water Dependent Terrestrial Ecosystems (GWDTE)

9. SEPA has a responsibility to protect groundwater abstractions and Groundwater Dependant Terrestrial Ecosystems (GWDTE). Foundations, borrow pits and linear infrastructure such as roads, tracks and trenches can disrupt groundwater flow and impact upon these sensitive receptors. Such impacts will vary depending on the scale and location of the development.
10. The study area will comprise all likely relevant habitat types within the Site and out to 300m (to allow for potential micrositing beyond the 250m buffer as per GWDTE guidance) to comply with SEPA guidance with regards to the identification of GWDTEs for subsequent hydrological assessment. The survey will seek to record the extent of any notable vegetation communities within the study area, including those classified as GWDTEs in accordance with Sniffer guidance (2009).
11. The results of these surveys will be used to inform a constraints plan. The principal mitigation measures adopted will be the use of buffer zones around sensitive areas of habitat, sensitive construction techniques and habitat management/restoration where appropriate. Significant impacts from the scheme will be identified using published CIEEM Guidelines.

### 6.3.3 Water Crossings

12. The route traverses a number of water courses which range in size from ditch systems to small rivers and tributaries of rivers. Some of these are associated with salmon and trout. The River Ythan Trust and Ugie River Salmon Fishery Board will be contacted to determine the level and type of surveys required.

### 6.3.4 Mammal Survey

13. Surveys will be undertaken within a buffer of between 100 to 250m of the planned infrastructure, to take into account variations in micrositing. Surveys for terrestrial mammals will follow current NatureScot guidance[9] and will comprise walkover searches for evidence of presence or the potential presence of bats, badger, otter, water vole, red squirrel and pine marten. The surveys will include checks for any suitable bat roost structures, specifically within trees and the Bat Conservation Trust Guidance will be followed for bat surveys[10].

[8] JNCC, (2010), Handbook for Phase 1 habitat survey – a technique for environmental audit, JNCC, Peterborough. Updated with corrections 2016. https://hub.jncc.gov.uk/assets/9578d07b-e018-4c66-9c1b-47110f14df2a

[9] NatureScot: Planning and development: protected species; https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-protected-species

[10] Collins, J. (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). https://www.bats.org.uk/resources/guidance-for-professionals/bat-surveys-for-professional-ecologists-good-practice-guidelines-3rd-edition

### 6.3.5 Bats

14. All species of bats occurring in Scotland are classed as European Protected Species (EPS) under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). For any wild bat species, it is an offence to deliberately or recklessly:
    - Capture, injure or kill a bat;
    - Harass a bat or group of bats;
    - Disturb a bat in a roost (any structure or place it uses for shelter or protection);
    - Disturb a bat while it is rearing or otherwise caring for its young;
    - Obstruct access to a bat roost or otherwise deny an animal use of a roost;
    - Disturb a bat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species; and
    - Disturb a bat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.
15. It is also an offence to:
    - Damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly), and
    - Keep, transport, sell or exchange, or offer for sale or exchange any wild bat (or any part or derivative of one) obtained after 10 June 1994.
16. This means that if bats could be affected in these ways by a development, and no action is taken to prevent it, an offence may be committed. Surveys for bats will be required if trees or buildings are to be removed. Any tree or structure to be removed will require a Potential Roost Assessment to be carried out. This determines if the tree or building has bat roost potential. If this is positive, then bat roost surveys following the appropriate methodology will be carried out. Surveys will be:
    - No more than 18 months old;
    - Carried out in line with the Bat Surveys for Professional Ecologists: Good Practice Guidelines (BCT, Collins 2016).
17. The surveys will establish presence or absence of roosts and if bats are present the species, numbers (or estimated numbers), function of the roost and flight lines away from the roost. See Collins (BCT, 2016).

### 6.3.6 Badgers

18. Both badgers and their setts are protected by law. The Protection of Badgers Act 1992 (Scottish Version) brings together all the previous legislation specific to badgers (except their inclusion on Schedule 6 of the 1981 Wildlife and Countryside Act, as amended Nature Conservation (Scotland) Act 2004). As a result, it is an offence to:
    - Willfully kill, injure, possess or cruelly ill-treat a badger, or attempt to do so;
    - To intentionally or recklessly interfere with a sett;
    - To disturb a badger when it is occupying a sett;
    - Damage or destroy a sett; and
    - To obstruct access to, or any entrance of a badger sett.

19. A badger sett is defined in the legislation as 'any structure or place, which displays signs indicating current use by a badger'. 'Current use' does not simply mean 'current occupation' and for licensing purposes it is defined as 'any sett within an occupied badger territory regardless of when it may have last been used'. A sett therefore, in an occupied territory, is classified as in current use even if it is only used seasonally or occasionally by badgers, and is afforded the same protection in law.

### 6.3.7 Badger Survey Methodology

20. The Proposed Development area (red line boundary) plus a buffer around the site will be surveyed. A standard buffer around the site will be 100m to give consideration to setts out with, but close to, the development. This buffer will only be increased to larger distance around the site if the works within the site may be disturbing (e.g., blasting).
21. All land within the survey area will be surveyed for badgers. This involves viewing all areas of the survey area for setts or other field signs. Badgers will commute from setts to foraging areas along paths, and they will demarcate their territories using dung in pits, often positioned along linear features which form the boundaries of their territory. Open areas such as grazed fields/edges of plantations will be surveyed.
22. Transects lines will be walked through the habitat to ensure full ground coverage. The distance between the transect lines will be dependent on the density of the vegetation cover. For example, transect lines in coniferous plantation such as Sitka spruce will need to be positioned at 5m intervals, whereas in open broadleaved woodland, ground cover may permit transects to be 20m apart. Linear landscape features such as walls and fences will also be walked along in order to identify any territory markings or badger crossing points.
23. A total sett survey will be conducted on site, including determination of where the badgers roam, feed and obtain water. This information will ensure that any future development, will not interfere with the mammal's pathway to its food & water supply, as well as the setts.
24. The sett survey will include the total number of holes within a sett; number of well used holes & disused holes, which can give a guide to the level of activity of the sett.
25. Classification of the sett will also be determined into Main, Annex, Subsidiary or Outlier setts. During the survey, each sett entrance will be classified according to its degree of usage:
    - Well Used (WU) are clear of debris and vegetation, sides worn smooth but not necessarily excavated recently;
    - Partially used (PU) are not in regular use and have debris e.g. twigs and leaves in the entrance. They could be used after only a minimal amount of clearance; and
    - Disused (D) not in use for some time, are partially blocked and could not be used without considerable effort. If the hole has been disused for some time all that may be visible is the overgrown spoil heap and a depression in the ground where the hole used to be. Rabbits and foxes may take over part of a sett and keep disused entrances open.
26. Field signs of badgers will also be recorded such as path networks, latrines and larger territorial latrines at boundary edges. Evidence of badger activity searched for will include the following:
    - Setts: badger setts typically have characteristic shapes and dimensions;
    - Paw prints and badger hair caught on hedges and fences;
    - Scratching posts
    - Foraging signs: foraging badgers leave distinctive marks when foraging, such as diggings or snuffle holes (where badgers have inserted their snouts into the ground to search for earthworms and insects);

- search for earthworms and insects);
- Characteristic worn pathways and Paths linking setts and foraging areas; and
- Latrines: badgers defecate in pits, often clustering several pits into a latrine.

### 6.3.8 Otters

As a EPS, the otter is fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). It is an offence to deliberately or recklessly:

- 
- Capture, injure or kill an otter;
- Harass an otter or group of otters;
- Disturb an otter in a holt or any other structure or place it uses for shelter or protection;
- Disturb an otter while it is rearing or otherwise caring for its young;
- Obstruct access to a holt or other structure or place otters use for shelter or protection, or otherwise deny the animal use of that place;
- Disturb an otter in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species; and
- Disturb an otter in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

27. It is also an offence to:
    - Damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly), and
    - Keep, transport, sell or exchange, or offer for sale or exchange any wild otter (or any part or derivative of one) obtained after 10 June 1994.
28. Otter shelters are legally protected whether or not an otter is present. Otters could be affected by a development proposal close to a water course, wetland, coastline or estuary.

### 6.3.9 Otter Survey Methodology

29. An otter survey will be carried out for the proposal within 200m of suitable habitat. Otter surveys can be carried out at any time of year but will avoid periods following prolonged heavy rainfall and/or high water when spraints and other signs of otter may have been washed away. Heavy frost or recent snow can also make finding spraints difficult. All suitable otter habitat within 200m of the proposed works will be surveyed, including a systematic search for:
    - Spraints or otter faeces. Often found on boulders, under bridges, elevated positions, fallen trees or on piles of grass;
    - Paw prints in muddy or silted areas along the burn edges;
    - Hairs;
    - Characteristic worn pathways/slides or haul out areas;
    - Food remains;
    - Sleeping and resting places/shelters including holts, couches and natal dens; and
    - Breeding sites.

30. Type of otter activity (Holts & Couches) explained further:
    - Holts: otter holts are often found in various situations. These include cavities in a riverbank, hollow trees, between roots, rocky clefts, rabbit burrows or tunnels in peat. The entrance may be underwater with an air vent into the chamber, which is lined with dry vegetation; and
    - Couches: otters often have resting spots or couches whey they lay up. An otter may have many holts or resting sites within its home range.
31. Field signs for recognising a natal den can include:
    - A heavily used path or paths from the water into dense cover or an enclosed structure;
    - Bedding within the structure which may consist of grass, ferns or reeds (bedding may also be present in other types of resting places);
    - A latrine containing a large number of spraints at the den or within 2m of it (this is not always the case – sometimes the female will excrete in the water to ensure that there are no signs of occupation near the natal den);
    - A cub play area which may be a well-worn area around a tree or on a bank; and
    - Different sized otter prints
32. Habitat types associated with breeding sites are:
    - Extensive reed beds;
    - Ponds and lakes;
    - Deciduous woodlands;
    - Young conifer plantations; and
    - Extensive areas of scrub.

### 6.3.10 Water Vole

33. The water vole receives partial protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). See the Wildlife and Countryside Act 1981 Schedules 5 and 6 for full details.
34. In Scotland, this legal protection is currently restricted to the water vole's places of shelter or protection and does not extend to the animal itself, but are listed on the UK BAP. Full protection, to also cover the animal, is proposed. It is an offence to intentionally or recklessly:
    - Damage, destroy or obstruct access to any structure or place that water voles use for shelter or protection, and
    - Disturb a water vole while it is using any such place of shelter or protection.

### 6.3.11 Water Vole Survey Methodology

35. Timing: The water vole breeding season runs from April to September. This is the ideal time to carry out a water vole survey as the water voles will be highly active and leave many signs, such as latrines (conspicuous piles of droppings) which can be used to confirm their presence during a survey. Habitat assessments can also be undertaken during winter. Surveys at that time can determine presence, although absence of water voles can only be confirmed by spring or summer surveys.
36. Habitat Assessment: As part of the water vole survey, the habitat suitability for this species will be assessed. This will include an assessment of the foraging resources, the suitability of the banks for burrowing and the presence of adequate cover/shelter.

37. Surveying for Water Vole Evidence: A water vole survey will involve searching the banks of the watercourse for evidence of water vole including: burrows, latrines, footprints, runs in the vegetation, grazed 'lawns', feeding remains and actual sightings.

38. The following field signs include:

- Faeces - these are 8- 12mm long and 4- 5 mm wide, cylindrical with blunt ends. The colour is variable, though often green, and they are generally odourless or have a faint musky smell;
- Latrines - the majority of droppings are deposited at latrine sites, used to mark range boundaries or favoured spots close to burrows. Latrines are typically maintained between February and November and often consist of a flattened mass of old droppings topped with fresh ones;
- Feeding stations - water voles often bring pieces of cut vegetation to favoured feeding stations close to the water's edge and leave remains in neat piles;
- Burrows - many burrows can be found in riverbanks, but those constructed by water voles are typically wider than they are high, with a diameter of 4- 8cm. Around these holes, well-grazed 'lawns' can often be found, where the water voles have chewed the vegetation short; and
- Footprints - these can easily be confused with rat footprints.

39. Many of these signs may be obliterated by heavy rain or high-water levels, so negative surveys carried out in these circumstances should be treated with caution.

### 6.3.12 Red Squirrel

40. Red squirrels and their dreys (resting places) receive full protection under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally or recklessly:

- Kill, injure or take a red squirrel
- Damage, destroy or obstruct access to a drey or any other structure or place which a red squirrel uses for shelter or protection
- Disturb a red squirrel when it is occupying a structure or place for shelter or protection

41. This protection does not apply to areas where red squirrels only feed.

42. It is also an offence to possess or control, sell or offer for sale, or possess or transport for the purpose of sale any living or dead red squirrel or any derivative of such an animal. Knowingly causing or permitting any of the above acts to be carried out is also an offence.

### 6.3.13 Red Squirrel Survey Methodology

43. Red squirrels can occur in various types of woodland, including gardens and parkland. Where red squirrels might be present, consideration is required if the Proposed Development includes the following:

- Felling trees that have a reasonable chance of containing dreys- suitable trees are usually 15 years or older and can be conifer or broadleaf species, or
- Felling and other works that could disturb dreys. This is likely to be where works are within 50m of trees containing a drey during the red squirrel breeding season (February to September inclusive). If works are confined to the non-breeding season, then the risk of disturbing red squirrels is much lower and only likely to occur where works are within 5m or one tree's distance of a potential drey location (whichever is less).

44. A red squirrel survey should be carried out if a proposal could potentially impact on red squirrels in these ways.

45. Surveys will follow the survey methods as detailed in the Practical techniques for Surveying and Monitoring squirrels (Forestry Commission, 2009) and will consider the following:

- Surveys can be carried out at any time of year, as red squirrels are active all year round. However, it is quicker and easier to survey broadleaved or larch woodland in the winter when the squirrels and their dreys are more easily seen.
- Surveys of squirrel activity will commence as soon after first light as possible, as this is the time when squirrels are most likely to be active.
- Surveying in heavy rain, strong winds or when it is very cold will be avoided, as red squirrels are less likely to be active.
- Use on non-invasive survey methods, such as,
  - Visual surveys
  - Hair-tube surveys
  - Drey counts
  - Feeding sign surveys
  - Whole maize bait
- A basic sampling method or distance sampling method may be applied.
- Population density may be calculated from the distance sampling data.

### 6.3.14 Pine Marten

46. Pine martens are the second rarest carnivore in the UK. The pine marten receives full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Certain methods of killing or taking pine martens are illegal under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). It is an offence to intentionally or recklessly:
    - Kill, injure or take a pine marten;
    - Damage, destroy or obstruct access to a nest or den – i.e. any structure or place which such an animal uses for shelter or protection; and
    - Disturb such an animal when it is occupying a nest or den for shelter or protection (except when this is inside a dwelling house).
47. Possession, sale and transport offences are ones of strict liability (they don't require intention or recklessness). It is an offence to:
    - Possess or control, sell, offer for sale, or possess or transport for the purpose of sale any living or dead pine marten or any derivative of such an animal, and
    - It is also an offence to knowingly cause or permit any of the above acts to be carried out.

### 6.3.15 Pine Marten Survey Methodology

48. The survey will include a systematic search for signs of pine marten presence and potential den sites within 250m of a development. Pine martens are elusive and largely nocturnal, which makes them difficult to see, but their scats are often quite distinctive and the most commonly encountered field sign. Scats are most easily found along forest tracks. Scat is highly variable depending on diet but classic pine marten scat is highly twisted and contains bone fragments and hair. Pine marten scat also has a sweet parma violet fragrance. Pine martens prefer overhead cover in woods and their dens can be found in large holes or cavities in trees and breeding nests can be found in rocks, in hollow trees or in a bird's or squirrel's nest. Pine martens are active all year round but are best surveyed between May and September, and ideally in June-August when scats are most

abundant. Pine martens are more active at this time (June-August) and weather conditions or leaf litter are less likely to degrade or obscure scats. DNA analysis of scat samples is commonly used to provide a positive identification.

49. The use of hair tubes and remote infra-red cameras can also be used to confirm the presence of pine martens. Camera traps can also be used to confirm the occupation of den sites and to determine if they are being used for breeding (March-June inclusive). However, using camera traps close to a potential breeding den can cause disturbance and will require a survey licence from NatureScot.

## 6.4 Assessment Methodology

50. The assessment of effects on the ecological features presented within the EIA Report will be consider the potential for significant effects upon important features, as a result of the construction, operational and decommissioning phase of the Proposed Development. Assessment will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (2018) and will include the following stages:

- Determination and evaluation of important ecological features;
- Identification and characterisation of impacts;
- Outline of mitigating measures to avoid and reduce significant impacts;
- Assessment of the significance of any residual effects after such measures;
- Identification of appropriate compensation measures to offset significant residual effects; and
- Identification of opportunities for ecological enhancement.

## 6.5 Baseline

51. The assessment of effects on the ecological features presented within the EIA Report will be consider the potential for significant effects upon important features, as a result of the construction, operational and decommissioning phase of the Proposed Development. Assessment will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (2018) and will include the following stages:

- Determination and evaluation of important ecological features;
- Identification and characterisation of impacts;
- Outline of mitigating measures to avoid and reduce significant impacts;
- Assessment of the significance of any residual effects after such measures;
- Identification of appropriate compensation measures to offset significant residual effects; and
- Identification of opportunities for ecological enhancement.

## 6.6 Baseline

52. The Proposed Development Site is located in Aberdeenshire and connects from the east coast either north (St Fergus) or south (Boddam) of Peterhead and the route then traverses through arable countryside to New Deer connection. Baseline ecological conditions to inform the design and assessment of the Proposed Development, will be established by means of:

- Desk-based assessments of existing available data and information;
- Consultations with stakeholders; and

- Site-specific field surveys and monitoring.

53. The process will identify sensitive receptors, particularly those that are the subject of statutory or local designations. Constraints will be identified and used to inform the final development and infrastructure layout. The desk study will include a review of, but not limited to:
    - Existing data on statutory designated sites available through NatureScot Sitelink website11 (up to 5 km from the site);
    - Scotland's Environment12;
    - Magic Map DEFRA13;
    - Existing data on non-statutory designated sites available through the proposed Aberdeenshire Council Local Development Plan 2020 (ALDP) 14 & ALDP 202215, if complete (up to 2km from the site);
    - Records of Ancient Woodland (up to 2km from the site);
    - Records from the Aberdeenshire Council Biodiversity Officer;
    - Records from Scottish Badgers16;
    - The UK Biodiversity Action Plan (UKBAP)17;
    - The Scottish Biodiversity List18; and
    - Biological information from the North East Scotland Biological Records Centre for Aberdeenshire (NESBReC)19
54. Table 6.1 details the designated sites located within 2km of the Proposed Development that have ecological interests.

**Table 6.1 - Ecologically and geomorphology designated sites within 2km of the Proposed Development**

| Ecologically designated sites within 5km of the Proposed Development | | | |
|---|---|---|---|
| **Name** | Distance (km) | Qualifying Interests | Status |
| **Hill of Longhaven SSSI** | Within 250m survey extent of Route 1 | Quaternary geology & geomorphology | Unfavourable Declining (2010) |
| **Rora Moss SSSI** | 1.3 km north of Route 2 | Raised bog | Unfavourable No change (2021) |

55. Baseline ecology field surveys will comprise the following:
    - Terrestrial habitat & vegetation survey, and
    - Terrestrial mammal survey (protected species.

[11] NatureScot Sitelink; https://sitelink.nature.scot/home
[12] Scotland's Environment; https://www.environment.gov.scot
[13] MAGIC Map; https://magic.defra.gov.uk/home.htm
[14] Proposed Aberdeenshire Local Development Plan 2020 https://www.aberdeenshire.gov.uk/planning/plans-and-policies/pldp-2020/
[15] Aberdeenshire Local Development Plan 2022 (awaiting finalisation) https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2022/
[16] Scottish Badgers; https://www.scottishbadgers.org.uk
[17] https://jncc.gov.uk/our-work/uk-bap-priority-species/
[18] The Scottish Biodiversity List; https://www.nature.scot/scottish-biodiversity-list
[19] North East Scotland Biological Records Centre http://www.nesbrec.org.uk

## 6.7 Mitigation

56. The adoption of embedded mitigation measures to avoid or minimise adverse impacts upon ecological features will be part of the iterative design process for the Proposed Development. Measures to avoid or otherwise minimise potentially adverse impacts upon ecological features during scheme design will include:

- Land-take: Development infrastructure will be designed to minimise the requirement for land-take and the number of watercourse crossings or horizontal directional drilling;
- Watercourse crossings: New watercourse crossings required will be designed in accordance with best practice and enable the free passage of fish and other wildlife;
- Construction Environmental Management Plan: A Construction Environmental Management Plan (CEMP) will be in place during the construction, operational and decommissioning phases of the development. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the development in line with current guidance.
- ECoW: It would be expected that the ECoW would undertake pre-construction protected species surveys during the appropriate survey months prior to construction.

57. Full details of embedded and site-specific mitigation measures in relation to ecology will be detailed within the EIA Report.

## 6.8 Reporting

58. The final report will provide commentary across each phase of the development process construction, operation, and decommissioning.

### 6.8.1 Construction Phase

59. During the construction phase of the Proposed Development, in the absence of mitigation, adverse effects upon ecological features to be addressed within the EIA Report may arise from:

- Habitat loss, fragmentation, severance or change as a result of the delivery and installation of development infrastructure; and
- Disturbance, inadvertent killing or injuring of protected or otherwise notable species or inadvertent damage to their breeding sites or resting places.

60. There will be no direct impacts upon any designated site for nature conservation. The potential for indirect effects upon ecological features, including designated sites, as a result of the potential spillage and/or mitigation of pollutants during the construction phase will be considered, however, potentially significant effects are considered to be highly unlikely on the basis of spatial separation and on the basis of best practice construction methods and pollution prevention controls. The requirement for new watercourse crossings and horizontal directional drilling, will also be minimised as part of the iterative design process and where required be of a sensitive design, to ensure the free passage of water vole, fish and other wildlife beneath. This will include avoidance of peatland and woodland designated within the Ancient Woodland Inventory (AWI) as part of the iterative design process.

### 6.8.2 Operational Phase

61. During operation of the Proposed Development, in the absence of mitigation, adverse effects upon ecological features to be addressed within EIA Report may arise from:

- Disturbance to protected or otherwise notable species as a result of operational activities such as vehicular traffic and maintenance works;

- Habitat loss or change, inadvertent killing or injuring of protected or otherwise notable species resulting from the potential spillage and/or mitigation of pollutants.

62. Such effects are however, considered highly unlikely to be significant due to the nature of the Proposed Development, requiring low levels of continued human presence after commissioning and the incorporation of best practice pollution prevention controls. The incorporation of buffers from EPS habitat features (e.g. woodland and watercourses) will also form part of the iterative design process.

### 6.8.3 Decommissioning Phase

63. Potential impacts associated with the decommissioning phase are likely to be similar to those identified for the construction phase.

### 6.8.4 Presentation of sensitive information

64. Ecological data considered sensitive (e.g. that pertaining to the locations of breeding and/or resting places of protected species) will be included in a confidential appendix to the EIA Report. This will not be made publicly available but will be issued to NatureScot.

### 6.8.5 Further Consultation

65. Further consultation with NatureScot and Aberdeenshire Council is proposed in relation to the scope of ecological baseline information gathering at the earliest convenience.

## 6.9 Questions

- Q6/1: Do consultees agree that the range of ecological surveys proposed is sufficient and proportionate to inform the design and assessment of the Proposed Development?
- Q6/2: Do consultees agree that the full range of likely effects to be assessed within the EIA Report has been adequately identified and is proportionate to the nature of the Proposed Development?
- Q6/3: Are there any other relevant consultees who should be contacted with respect to the ecology assessment and scope of baseline information gathering?

# 7 Ornithology

1. Input into the Scoping Report has been prepared by GLM Ecology.

## 7.1 Introduction

2. This chapter will consider the potential impacts of the Proposed Development on the ornithological features present within the site. They will summarise the methods used to establish the baseline conditions within the site and its surroundings, the results of the baseline surveys, and the process used to determine the sensitivity of the bird species' populations present in their habitats. The ways in which bird species and their habitats might be affected (directly or indirectly) by the construction, operation and decommissioning of the Proposed Development will be assessed, prior to and after any mitigation measures are considered. In addition, any cumulative effects will be considered, taking together impacts of other development projects in the area, whether operational, consented or at application stage, along with the significance of any predicted effects of the Proposed Development.
3. All ornithological personnel working on the project are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and have extensive experience of cable routes, building developments, solar farms and wind developments. The assessment of effects presented within the EIA Report will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (2018).

## 7.2 Guidance

### 7.2.1 Ornithology Legislation

4. The ornithology assessment will be carried out in accordance with the principles contained within the following retained EU legislation:
   - European Union Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora;
   - European Union Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy ("Water Framework Directive"); and
   - Environmental Impact Assessment Directive 2014/52/EU.
5. The following national legislation will be considered as part of the ornithological assessment:
   - The Wildlife and Countryside Act 1981 (as amended);
   - The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (''The Habitats Regulations'');
   - The Water Environment and Water Services (Scotland) Act 2003 (WEWS);
   - The Nature Conservation (Scotland) Act 2004 (as amended);
   - The Wildlife and Natural Environment (Scotland) Act 2010; and
   - The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

### 7.2.2 Ornithology Guidance

6. The ornithological assessment will be carried out in accordance with the principles contained within the following guidance documents:

- CIEEM (2018). Guidelines for ecological impact assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (2nd Edition);
- Joint Nature Conservation Committee (2013). Guidelines for selection of biological Sites of Special Scientific Interest (SSSI);
- Scottish Executive (2019). Scotland's Forestry Strategy (2019-2029) https://www.gov.scot/publications/scotlands-forestry-strategy-20192029/ ;
- Scottish Executive Rural Affairs Department (SERAD) (2000). Habitats and Birds Directives, Nature Conservation: Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the Conservation of Wild Birds (''The Habitats and Birds Directives''). Revised Guidance Updating Scottish Office Circular No 6/1995;
- Scottish Government (2001). European Protected Species, Development Sites and the Planning Systems: Interim guidance for local authorities on licensing arrangements;
- Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015). Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746;
- Scottish Natural Heritage (2016). Assessing connectivity with Special Protection Areas.

## 7.3 Survey Methodologies & Assessment

### 7.3.1 Key Target Species

7. Key target species for the assessment have been identified following NatureScot (SNH, 2018a) guidance using the following criteria:
   - Species listed on Annex 1 of the EU Birds Directive;
   - Species listed on Schedule 1 of the 1981 Wildlife & Countryside Act;
   - Red-listed species on the Birds of Conservation Concern list (Eaton et al. 2015).
8. The ornithological assessment will, therefore, give particular consideration to all species recorded during the baseline surveys at the site that meet any of these criteria.

### 7.3.2 Vantage Point Survey Methodology

9. No Vantage Point (VP) surveys will be undertaken for the Proposed Development as Collision Risk Mortality for any Schedule 1 bird species of Birds of Conservation Concern (BoCC) will be zero due to the construction and operation methodology.

### 7.3.3 Breeding Bird Survey Methodology

10. Three breeding bird survey (BBS) visits will be carried out between April and June, targeting all areas of suitable habitat within 500m of the proposed onshore cable corridor and its infrastructure, as detailed in SNH, 2017.

### 7.3.4 Ornithological Survey Timelines

11. It is considered that the above survey effort is sufficient to allow a robust characterisation of the baseline ornithological assemblage and usage of the Proposed Development site and surrounding area, when used in combination with the information and data sets collated from other sources.

## 7.4 Assessment Methodology

12. The assessment of effects on the ornithological features presented within the EIA Report will consider the potential for significant effects upon important features, as a result of the construction, operational and decommissioning phases of the Proposed Development.
13. Assessment will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (2018) and will include the following stages:
    - Determination and evaluation of important ornithological features;
    - Identification and characterisation of impacts;
    - Outline of mitigating measures to avoid and reduce significant impacts;
    - Assessment of the significance of any residual effects after such measures; and
    - Identification of appropriate compensation measures to offset significant residual effects; and
    - Identification of opportunities for ecological enhancement.

## 7.5 Baseline

14. The site is located across arable countryside with woodland and water courses in Aberdeenshire, from the east coast in the vicinity of Peterhead to New Deer. Baseline ornithological conditions to inform the design and assessment of the Proposed Development, will be established by means of:
    - Desk-based assessments of existing available data and information;
    - Consultations with stakeholders; and
    - Field surveys and monitoring.
15. The process will identify sensitive receptors, particularly those that are the subject of statutory or local designations. Constraints will be identified and used to inform the final development and infrastructure layout. The ornithological desk study will include a review of, but not limited to:
    - Existing data on statutory designated sites available through NatureScot Sitelink website (up to 20 km from the site), specifically where the qualifying feature is related to birds;
    - Scotland's Environment;
    - Magic Map DEFRA;
    - Existing data on non-statutory designated sites available through the Aberdeenshire Council Local Development Plan 201720 (ALDP) specifically, where the qualifying feature is related to birds;
    - Ornithological specific records from the Aberdeenshire Biodiversity Officer;
    - Records from the North East Scotland Raptor Study Group;
    - The UK Biodiversity Action Plan (UKBAP);
    - The Scottish Biodiversity List; and
    - North-East Scotland Biological Records Centre (NESBReC21)

[20] Aberdeenshire Local Development Plan 2017 https://www.aberdeenshire.gov.uk/planning/plans-and-policies/aberdeenshire-local-development-plan-2017/
[21] http://www.nesbrec.org.uk

16. Table 7.1 details the designated sites located within 2km of the Proposed Development that have ornithological interests.

**Table 7.1 - Designated sites with ornithological features within 20km of the Proposed Development**

| Ecologically designated sites within 2 km of the Proposed Development | | | |
|---|---|---|---|
| **Name** | **Distance (km)** | **Qualifying Interests** | **Status** |
| **Buchan Ness to Collieston Coast SPA** | 0.3 | Birds:<br>Seabird assemblage, breeding<br>Fulmar (Fulmarus glacialis), breeding<br>Herring gull (Larus argentatus), breeding<br>Guillemot (Uria aalge), breeding<br>Kittiwake (Rissa tridactyla), breeding<br>Shag (Phalacrocorax aristotelis), breeding | <br>Favourable Recovered<br>Unfavourable Declining<br>Unfavourable No change<br>Favourable Maintained<br>Unfavourable No change<br>Unfavourable No change |
| **Bullers of Buchan Coast SSSI** | 1.8 | Birds:<br>Seabird colony, breeding<br>Kittiwake (Rissa tridactyla), breeding<br>Guillemot (Uria aalge), breeding<br>Shag (Phalacrocorax aristotelis), breeding | <br>Favourable Maintained<br>Unfavourable No change<br>Favourable Recovered<br>Favourable Maintained |

17. Ornithological surveys will follow the standard NatureScot guidance. Given the species listed in Table 7.1 are all breeding seabirds then they are all scoped out of further assessment within this report as all construction work will be more than 0.3 km away from breeding areas. Baseline ornithological field surveys will comprise of the following:

- Breeding Bird Surveys, from April-June.
- If NESBReC and the North East Scotland Raptor Study Group provide confidential information on breeding Schedule 1 raptors and BoCC within a 2km zone of the construction footprint then the following targeted surveys will be required.
- Breeding Raptor and Owl Surveys: 2021 breeding season within the Proposed Development site and with a 2 km buffer, as listed on Annex 1 of the Birds Directive, or Schedule 1 of the Wildlife & Countryside Act 1981 (as amended).

## 7.6 Mitigation

18. The adoption of embedded mitigation measures to avoid or minimise adverse impacts upon ecological and ornithological features will be part of the iterative design process for the Proposed Development . Measures to avoid or otherwise minimise potentially adverse impacts upon ornithological features during scheme design will include:

- Land-take - Development infrastructure will be designed to minimise the requirement for land-take, felling of woodland, the number of watercourse crossings or horizontal directional drilling;
- Construction Environmental Management Plan - A Construction Environmental Management Plan (CEMP) will be in place during the construction, operational and decommissioning phases of the development. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the development in line with current guidance.

- All breeding bird and targeted species surveys - are only required within the breeding bird season of March-August inclusive. If construction work and vegetation removal take place between September-February inclusive then no breeding bird surveys are required.
- EcoW - It would be expected that the ECoW (Ecological Clerk of Works) would undertake pre-construction breeding surveys during the appropriate survey months prior to construction.

19. Full details of embedded and site-specific mitigation measures in relation to ornithology will be detailed within the EIA Report.

## 7.7 Reporting

20. The final report will provide commentary across each phase of the development process construction, operation, and decommissioning.

### 7.7.1 Construction Phase

21. During the construction phase of the Proposed Development, in the absence of mitigation, adverse effects upon ornithological features to be addressed within the EIA Report may arise from:
    - Habitat loss, fragmentation, severance or change as a result of the delivery and installation of development infrastructure; and
    - Disturbance, inadvertent killing or injuring of protected or otherwise notable species or inadvertent damage to their breeding sites or resting places

### 7.7.2 Operational Phase

22. During operation of the Proposed Development, in the absence of mitigation, adverse effects upon ornithological features to be addressed within EIA Report may arise from:
    - Disturbance to protected or otherwise notable species as a result of operational activities, such as vehicular traffic and maintenance works; and
    - Habitat loss or change, inadvertent killing or injuring of protected or otherwise notable species resulting from the potential spillage and/or mitigation e of pollutants;

### 7.7.3 Decommissioning Phase

23. Potential impacts associated with the decommissioning phase are likely to be similar to those identified for the construction phase.

### 7.7.4 Presentation of sensitive information

24. Ornithological data considered sensitive (e.g. that pertaining to the locations of breeding and/or resting places of protected bird species) will be included in a confidential appendix to the EIA Report. This will not be made publicly available but will be issued to NatureScot.

### 7.7.5 Enhancement

25. Suitable principles for biodiversity enhancement to be delivered as part of the Proposed Development will be outlined within the EIA Report. The appropriateness and feasibility of principles will be confirmed in consultation with NatureScot and relevant consultees, as necessary, over the course of the EIA process.

### 7.7.6 Further Consultation

26. Further consultation with NatureScot is proposed in relation to viewpoints and the scope of ornithological baseline information gathering at the earliest convenience.

## 7.8 Questions

- Q7/1: Do consultees agree that the range of ornithological surveys proposed is sufficient and proportionate to inform the design and assessment of the Proposed Development ?
- Q7/2: Do consultees agree that the full range of likely effects to be assessed within the EIA Report has been adequately identified and is proportionate to the nature of the Proposed Development ?
- Q7/3: Are there any other relevant consultees who should be contacted with respect to the ornithology assessment and scope of baseline information gathering?

# 8 Cultural Heritage

## 8.1 Introduction

1. Cultural heritage is represented by a wide range of features, both above and below ground, which result from past human use of the landscape. These can include standing buildings, many of which are still in use; sub-surface archaeological remains and artefact scatters; industrial remains; earthwork monuments and landscape features such as field boundaries. The aim of this study is to identify elements of archaeological and cultural heritage value that may be directly or indirectly impacted upon by the proposed.
2. The following information is presented within this scoping chapter:
   - Baseline of known cultural sites within the vicinity of proposed infrastructure; and
   - The indirect impact within the proposed area of the substation.

## 8.2 Policy and Legislation

3. Statutory, general, national and local guidance for assessing the potential impact of development on cultural heritage features is provided within:
   - Historic Environment Scotland Act, 2014;
   - Scottish Planning Policy (SPP), 2014, 'Valuing the Historic Environment', (pages: 33-35);
   - Historic Environment Policy for Scotland, 2019;
   - Historic Environment Circular 1, 2016;
   - Managing Change in the Historic Environment guidance note series;
   - Pan 2/2011 – Planning and Archaeology;
   - Planning Policy Advice: Historic Environment; and
   - Supplementary Guidance: Historic Built Environment.

## 8.3 Methodology

4. In the preparation of the assessment, a range of historical and technical data will be collected and analysed. This will include a review of all potential features that fall under the umbrella term of cultural heritage, such as historic buildings and landscapes, in addition to purely archaeological factors. The following sources will be consulted:
   - Historic Environment Record (HER);
   - National Monuments Record Scotland (NMRS);
   - Historic Environment Scotland's database of; Listed Buildings, Scheduled Monuments (SMs), Gardens and Designed Landscapes (GDLs), Conservation Areas, Inventory Battlefields, World Heritage Sites and monuments proposed for scheduling.

### 8.3.1 Consultation

5. Aberdeenshire Council and Historic Environment Scotland (HES) will be consulted with regards to the scope of the LVIA, including, the requirement for any visualisations required to assist the assessment.

### 8.3.2 Direct Impact

6. The area most at risk of direct impact will be land within the 100m corridor option and 50m either side of this for each route.

### 8.3.3 Indirect Impact

7. The indirect visual impact on the setting and character of known cultural heritage sites is considered for the four option locations for the substations not the cable routes. The cable will be buried and any indirect impact will be temporary during the construction phase.

### 8.3.4 Cultural Heritage and Archaeology Figures

8. The indirect visual assessment will make use of Zone of Theoretical Visibility (ZTV) maps to highlight areas that the substations are theoretically visible from. This is a 'bare earth' representation which does not take into account local screening from the natural and built environments. Visual representations will be produced when it is considered to be helpful in visualising the potential indirect visual impact of the substation.

### 8.3.5 Historic Maps

9. Historic maps held at the National Library of Scotland (Map Library) and aerial photographs will be consulted online as part of the desk based assessment.

### 8.3.6 Assessment Criteria

10. The following general criteria outlined in Table 8.1 and Table 8.2 will be used in the assessment of level of effect of any direct or indirect impact on any site of cultural heritage importance.

**Table 8.1 - Sensitivity of cultural heritage and archaeological features**

| Sensitivity | Definition |
|---|---|
| **High** | Category A listed buildings<br>Category B listed buildings<br>Scheduled Monuments<br>Non-statutory List of sites likely to be of national importance<br>Gardens and Designed Landscapes<br>World Heritage Sites<br>Inventory Battlefields |
| **Medium** | Category C listed buildings<br>Archaeological sites on the Sites and Monuments Record (of regional and local importance)<br>Conservation Areas |
| **Low** | Archaeological sites of lesser importance<br>Non-Inventory Gardens and Designed Landscapes |

**Table 8.2 - Magnitude of cultural heritage and archaeological effects**

| Magnitude | Definition |
|---|---|
| **High** | Where development may result in:<br>• the removal or partial removal of key features, areas or evidence important to the historic character and integrity of the site, which could result in the substantial loss of physical integrity; and/or<br>• a substantial obstruction of existing view by the addition of uncharacteristic elements dominating the view, significantly altering the quality of the setting or the visual amenity of the site both to and from. |

| | |
|---|---|
| **Medium** | Where development may result in:<br>• the removal of one or more key features, parts of the designated site, or evidence at the secondary or peripheral level, but are not features fundamental to its historic character and integrity; and/or<br>• a partial obstruction of existing view by the addition of uncharacteristic elements which, although not affecting the key visual and physical relationships, could be an important feature in the views, and significantly alter the quality of the setting or visual amenity of the site both to and from. |
| **Low** | Where development may result in:<br>• a partial removal/minor loss, and/or alteration to one or more peripheral and/or secondary elements/features, but not significantly affecting the historic integrity of the site or affect the key features of the site; and/or<br>• an introduction of elements that could be intrusive in views, and could alter to a small degree the quality of the setting or visual amenity of the site both to and from. |
| **Negligible** | Where development may result in:<br>• a relatively small removal, and/or alteration to small, peripheral and/or unimportant elements/features, but not affect the historic integrity of the site or the quality of the surviving evidence; and/or<br>• an introduction of elements that could be visible but not intrusive in views, and the overall quality of the setting or visual amenity of the site would not be affected both to and from. |

11. The level of both direct and indirect effects that the Proposed Development may have on the surrounding features of historical significance is determined by the combination of the sensitivity and magnitude of change. The matrix set out in Table 3.1 is used to determine the overall significance of effect.

## 8.4 Baseline

### 8.4.1 Direct Impacts

12. There is potential for features of historical significance within the 100m corridor option and 50m either side of this for each route to be significantly and directly affected by the proposed cable route. Table 8.3 below lists the features which fall within this study area for each of the four route options. The location of these features in relation to the proposed cable routes are shown in figures as provided in Table 8.4.

**Table 8.3 - Historic Features within direct impact study area for routes, joining points and substation options**

| Can No. | Type | Monument ID | Name | Description |
|---|---|---|---|---|
| Joining Points 1-10, North Connect Joining Point and Substations 1-4 | | | | |
| No known features were found to be within these study areas for all joining points and substation options | | | | |
| Route 1 | | | | |
| Cultural Route 1 Sections 1, 2, 5 and 8 | | | | |
| No known features were found to be within these study areas | | | | |
| Cultural Route 1 Section 3 | | | | |
| CAN01 | Farmstead | 143745 | Auchtydore | Site of a building with an attached enclosure |
| CAN02 | Mace | 20174 | Kinmundy | Site of flint hammer found 1874 |
| Cultural Route 1 Section 4 | | | | |
| CAN03 | Croft | 264935 | Croft of Pettymarcus | No info |
| CAN04 | Croft | 264810 | Quarry Head, Shoemakers Croft | Remains of small croft, enclosure & well |
| CAN05 | Quarry | 264913 | Spital Quarry | Disused quarry – no info |
| CAN06 | Farmstead | 264909 | Heads of Skelmuir | No info |
| CAN07 | Farmstead | 264908 | Nether Heads | Standing structure – no info |
| Cultural Route 1 Section 6 | | | | |
| CAN08 | Implements (wood) | 19891 | Auchmaliddie | Site of wooden clubs found 1896 |

| Can No. | Type | Monument ID | Name | Description |
|---|---|---|---|---|
| CAN09 | Shield (bronze) | 19890 | Auchmaliddie | Two late Bronze Age shields found 1897 in peat moss |
| **Cultural Route 1 Section 7** | | | | |
| CAN10 | Cairn | 19895 | North Newmill | Few stones left. Site is noted as being within a triangle of walls as indicated on the 25" OS map. |
| **Cultural Route 1 Section 9** | | | | |
| CAN11 | Building | 143817 | Sandford Hill | Ruined Building |
| CAN12 | Fishing Bothy | 75962 | Heathery Haven, Salmon House | Remains of Salmon House |
| **Route 2** | | | | |
| **Cultural Route 2 Sections 3, 5 ,7 and 9** | | | | |
| No known features within these study areas | | | | |
| **Cultural Route 2 Section 1** | | | | |
| CAN01 | Enclosure, farmstead | 137287 | North Ednie | Roofless structures |
| CAN02 | Structure, quern | 142706 | North Ednie | Remains of paving & flint or unidentified pottery |
| **Cultural Route 2 Section 2** | | | | |
| CAN03 | Sluice | 216365 | St Fergus & North Ugie Water, canal & Lundertone sluice | Remains of sluice |
| CAN04 | Bridge | 216366 | St Fergus & North Ugie Water, canal & bridge | Small bridge over canal |
| CAN10 | Aqueduct | 81849 | St Fergus and North Ugie Water Canal, Inverguinzie Branch, Hallmoss Aqueduct | Ruined Aqueduct |
| **Cultural Route 2 Section 4** | | | | |
| CAN05 | Pit(s) | 346374 | Glen Ugie | Cluster of 4 small pits recorded as cropmarks |
| **Cultural Route 2 Section 6** | | | | |
| CAN06 | Chapel | 20546 | Chapel Hillock | No trace or evidence |
| CAN07 | Farmhouse | 266685 | Dens of Crichie | No information. Modern farm here now. |
| **Cultural Route 2 Section 8** | | | | |
| CAN08 | Structure | 156466 | Eastfield | Single unroofed structure shown on 1st edition but no longer on current OS map |
| **Route 3** | | | | |
| **Cultural Route 3 Sections 1, 3, 6 and 8** | | | | |
| No known features within study area | | | | |
| **Cultural Route 3 Section 2** | | | | |
| CAN01 | Farmstead | 143729 | Nether Savock | Ruined farmstead |
| **Cultural Route 3 Section 4** | | | | |
| CAN02 | Grave(s) | 20673 | Denward, 'Pedlars Graves' | Traditionally graves of pedlars. Noted in 1879 that it wasn't long ago that they were visible. No trace (1973) |
| **Cultural Route 3 Section 5** | | | | |
| CAN03 | Farmhouse | 264874 | Hogshillock | No information |
| **Cultural Route 3 Section 7** | | | | |

| Can No. | Type | Monument ID | Name | Description |
|---|---|---|---|---|
| CAN04 | Structure | 156466 | Eastfield | Single unroofed structure shown on 1st edition but no longer on current OS map |
| **Cultural Route 3 Section 9** | | | | |
| CAN06 | Building | 143817 | Sandford Hill | Ruined Building |
| CAN07 | Fishing Both | 75962 | Heathery Haven | Remains of Salmon House |
| **Route 4** | | | | |
| **Cultural Route 4 Sections 1, 3 and 7** | | | | |
| No known features within study area | | | | |
| **Cultural Route 4 Section 2** | | | | |
| CAN01 | Unidentified flint, pottery | 142708 | Ednie | Artefact scatter may be hillwash found during watching brief for gas pipeline. |
| CAN02 | Sluice | 216365 | St Fergus & North Ugie Water, canal & Lundertone sluice | Remains of sluice |
| CAN03 | Bridge | 216366 | St Fergus & North Ugie Water, canal & bridge | Small bridge over canal |
| CAN16 | Aqueduct | 81849 | St Fergus and North Ugie Water Canal, Inverguinzie Branch, Hallmoss Aqueduct | Ruined Aqueduct |
| **Cultural Route 4 Section 4** | | | | |
| CAN04 | Geological cropmarks | 361310 | Woodend | 2018 HES aerial survey |
| CAN05 | Farmhouse | 21029 | North Linshart | Farmhouse in use. |
| **Cultural Route 4 Section 5** | | | | |
| CAN06 | Cinerary urn(s) | 21082 | Mill Hill | Four urns found during quarrying 1838-39. |
| CAN07 | Mace | 20174 | Kinmundy | Site of flint hammer found 1874 |
| CAN08 | Croft | 264935 | Croft of Pettymarcus | No information |
| CAN09 | Croft | 264810 | Quarryhead, Shoemaker's Croft | Remains of a small croft. Ruins. |
| CAN10 | Quarry | 264913 | Spital, quarry | Disused quarry. |
| **Cultural Route 4 Section 6** | | | | |
| CAN11 | Farmstead | 264908 | Nether Heads | Standing structure – no info |
| CAN12 | Farmstead | 264909 | Heads of Skelmuir | No info |
| **Cultural Route 4 Section 8** | | | | |
| CAN13 | Implements (wood) | 19891 | Auchmaliddie | Site of wooden clubs found 1896 |
| CAN14 | Shield (bronze) | 19890 | Auchmaliddie | Two late Bronze Age shields found 1897 in peat moss |
| **Cultural Route 4 Section 9** | | | | |
| CAN15 | Cairn | 19895 | North Newmill | No trace of cairn, all stones removed. |

## Table 8.4 - List of Figures for each route

| Route 1 | Route 3 |
|---|---|
| Figure 8.1a Cultural Route 1, Section 1 | Figure 8.3a Cultural Route 3, Section 1 |
| Figure 8.1b Cultural Route 1, Section 2 | Figure 8.3b Cultural Route 3, Section 2 |
| Figure 8.1c Cultural Route 1, Section 3 | Figure 8.3c Cultural Route 3, Section 3 |
| Figure 8.1d Cultural Route 1, Section 4 | Figure 8.3d Cultural Route 3, Section 4 |

| | |
|---|---|
| Figure 8.1e Cultural Route 1, Section 5 | Figure 8.3e Cultural Route 3, Section 5 |
| Figure 8.1f Cultural Route 1, Section 6 | Figure 8.3f Cultural Route 3, Section 6 |
| Figure 8.1g Cultural Route 1, Section 7 | Figure 8.3g Cultural Route 3, Section 7 |
| Figure 8.1h Cultural Route 1, Section 8 | Figure 8.3h Cultural Route 3, Section 8 |
| Figure 8.1i Cultural Route 1, Section 9 | Figure 8.3i Cultural Route 3, Section 9 |
| **Route 2** | **Route 4** |
| Figure 8.2a Cultural Route 2, Section 1 | Figure 8.4a Cultural Route 4, Section 1 |
| Figure 8.2b Cultural Route 2, Section 2 | Figure 8.4b Cultural Route 4, Section 2 |
| Figure 8.2c Cultural Route 2, Section 3 | Figure 8.4c Cultural Route 4, Section 3 |
| Figure 8.2d Cultural Route 2, Section 4 | Figure 8.4d Cultural Route 4, Section 4 |
| Figure 8.2e Cultural Route 2, Section 5 | Figure 8.4e Cultural Route 4, Section 5 |
| Figure 8.2f Cultural Route 2, Section 6 | Figure 8.4f Cultural Route 4, Section 6 |
| Figure 8.2g Cultural Route 2, Section 7 | Figure 8.4g Cultural Route 4, Section 7 |
| Figure 8.2h Cultural Route 2, Section 8 | Figure 8.4h Cultural Route 4, Section 8 |
| Figure 8.2i Cultural Route 2, Section 9 | Figure 8.4i Cultural Route 4, Section 9 |

13. An assessment of the direct impact on these features will be carried out and used to inform the design. If any of the above features are close to the final layout, they will be fenced off to avoid accidental damage during the construction phase.

### 8.4.2 Indirect Visual Impacts

14. Figures 8.5a-d show the theoretical visibility of the possible substation locations. Regionally significant historical features out to 2km such as 'B' Listed Buildings and conservation areas have been considered; while nationally significant features such as A' Listed Buildings, Scheduled Monuments, Gardens and Designed Landscapes, Inventory Battlefields and World Heritage Sites have been considered out to 5km.Table 8.5 below lists these historical features found within the 5km (2km for 'B' listed buildings) study radius.

**Table 8.5 - Historical Features within 5km ('B' listed to 2km)**

| Ref | Schedule/LB Ref | Name | Description | Within ZTV | | | |
|---|---|---|---|---|---|---|---|
| | | | | Substation 1 | Substation 2 | Substation 3 | Substation 4 |
| **LB1 (B)** | LB9629 | Milbrex Church | Church 1881-12, rectangular plan. Original furnishings, no features of special note. | YES | YES | YES | YES |
| **LB2 (B)** | LB16160 | Cairnbanno House | Late 18th century, 2 storey granite rubble. Now farmhouse. | NO | NO | YES | YES |
| **SM1** | SM8229 | Gight Castle, dovecot | The monument comprises the remains of a dovecot associated with Gight Castle. The dovecot stands in woodland on the north edge of the Ythan Gorge. | NO | NO | NO | NO |
| **SM2** | SM2508 | Gight Castle | Remains of Gight (or Formantine) Castle and associated features. | NO | NO | NO | NO |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **SM3** | SM9392 | North Mains of Auchmaliddie, stone circle | Remains of recumbent stone circle situated on op of a low hill. 2 surviving stones. | N/A | YES | YES | YES |

## 8.5 Potential Effects

15. Two Scheduled Monuments, Gight Castle (SM2508) and Gight Castle dovecot (SM8229) found within the study area, lie outwith the ZTV for all four substation locations and will be scoped out of the final assessment. The remaining three cultural sites, Milbrex Church, Cairnbanno House (both 'B' listed buildings) and one scheduled monument, the stone circle at North Mains of Auchmaliddie will be taken forward in the assessment. They will be assessed as part of the planning submission for the cable route and will be accompanied by wirelines and/or photomontages where appropriate.

## 8.6 Mitigation

16. Planning guidance (SPP – Historic Environment) states that it is Government policy to protect and preserve archaeological sites and monuments in situ wherever feasible. Where preservation in situ is not possible planning authorities should ensure that an appropriate level of excavation, recording, analysis, publication and archiving is carried out, before and/or during development. If deemed appropriate a Programme of Archaeological Works including an Archaeological Watching Brief may be required during ground breaking works associated with the construction phase.

### 8.6.1 Operation – Permanent Land Affected

17. Current proposals indicate that it will be possible to avoid the known features of cultural heritage interest that are currently present, and as such direct impacts should be avoided. However, a detailed assessment and site walkover of the preferred cable route will be carried out. This baseline was prepared using data from Historic Environments Scotland, however, it is nevertheless possible that additional, unrecorded features do exist within the potential cable route area. In the event that archaeological features are encountered, a suitable program of archaeological works will be implemented to the satisfaction of the planning authority.

### 8.6.2 Restoration

18. It is not anticipated that any restoration measures are required. However, if required it will be agreed with the planning authority.

## 8.7 Summary

19. The Proposed Development is unlikely to give rise to significant effects in terms of indirect impacts on the setting of features of cultural heritage during the construction and operational phase. While the current baseline suggests that direct impact during the construction phase can be avoided.

## 8.8 Key Questions for Council and Consultees

- Q8/1: Do the Council and consultees agree with the proposed methodology and scope of assessment?
- Q8/2: Do the Council and consultees know of any cultural heritage assets in the vicinity of the development which it considers may raise significant issues with the EIA process?
- Q8/3: Do the Council and consultees know of any cultural heritage assets which have not been included within the assessment scope that require inclusion in the final scope?

# 9 Geology, Hydrology, Hydrogeology and Soils

## 9.1 Introduction

1. This assessment will present the impact of potential effects of the construction and operation of the Proposed Development on geology, hydrology and hydrogeology.
2. Understanding surface and groundwater environments is critically important to designing a successful project. Surface water includes watercourses, water bodies, and precipitation runoff. It provides an important resource for: potable and other uses; amenity; aesthetic value; conservation; ecological environments; and for recharge to groundwater systems. Groundwater is also an important resource. It proves more than a third of the potable water supply in the UK and includes all water stored in permeable underground strata (or aquifers). In addition, it provides essential baseflow to rivers and wetland areas, often supporting important ecological systems.

## 9.2 Policy and Legislation

3. Guidance for assessing the potential impact of the Proposed Development on the hydrological and hydrogeological features of the development study area will be based on the following statutory and general and national guidance. Any appropriate local policy and guidance will also be considered.

**Table 9.1 - Policy, Legislation & Guidance**

| | |
|---|---|
| **Scottish Environmental Protection Agency (SEPA) Guidance Documents** | PPG 1 General Guide to the Prevention of Pollution.<br>GPP 2 Above Ground Oil Storage Tanks.<br>PPG 3 Use and design of oil separators in surface water drainage systems.<br>GPP 4 Treatment and disposal of wastewater where there is no connection to the public foul sewer.<br>GPP 5 Works and maintenance in or near water.<br>PPG 6 Working at Construction and Demolition Sites.<br>GPP 8 Safe Storage and Disposal of Used Oils.<br>GPP 21 Pollution Incident Response Planning.<br>Managing River Habitats for Fisheries, 2002.<br>Special Requirements for Civil Engineering Contracts for the Prevention of Pollution, Version 2, SEPA, 2006.<br>Culverting of Watercourses, WAT-PS-06-02, 2015.<br>Natural Flood Management Handbook, 2015.<br>Indicative River & Coastal Flood Map (Scotland).<br>Planning advice on waste water drainage, 2011.<br>Temporary Construction Methods, WAT-SG-29, 2009.<br>SEPA Flood Risk and Planning Briefing Note, 2009.<br>Groundwater Protection Policy for Scotland, v3, 2009.<br>SEPA Position Statement 'The role of SEPA in Natural Flood Management', 2012.<br>Technical flood risk guidance for stakeholders, SS-NFR-P-002, 2015.<br>SEPA Regulatory Position Statement – Developments on peat, 2010.<br>Engineering in the water environment: good practice guide; River crossings, 2010.<br>Environmental Standards for River Morphology, WAT-SG-21, 2012. |

| | |
|---|---|
| | The Water Environment (Controlled Activities) (Scotland) Regulations 2011; A practical guide, Version 8.3 February 2019.<br>Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems, 2017.<br>Land Use Planning System SEPA Guidance Note 4: Planning guidance on on-shore windfarm developments, 2017.<br>SEPA Water quality classification interactive database (2019 data). |
| **Other Guidance Documents** | CIRIA C515 Groundwater Control - Design and Practice.<br>CIRIA C532 Control of Water Pollution from Construction Sites.<br>CIRIA C648 Control of Water Pollution from Linear Construction Projects.<br>CIRIA C689 Culvert Design and Operation Guide.<br>CIRIA C741 Environmental Good Practice on Site.<br>CIRIA C753 SUDS Manual<br>A handbook on environmental impact assessment; Guidance for Competent Authorities, Consultees and others involved in the Environmental Impact Assessment Process in Scotland. NatureScot, 2018.<br>River Crossings and Migratory Fish: Design Guidance, A Consultation Paper, The Scottish Executive.<br>Good Practice During Windfarm Construction, 2019 (4th Edition), Scottish Renewables (SR), NatureScot, SEPA, Forestry Commission Scotland (FCS), Historic Environment Scotland and Marine Scotland Science.<br>Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only.<br>Forestry & Water Scotland (2018) Protecting Private Water Supplies During Forestry Activities, |
| **Scottish Government Policy, Advice and Legislation Documents** | The Housing Scotland (Act) 1987 (Sect 86).<br>PAN 79: Water and Drainage, 2006.<br>Planning Advice Note (PAN) 61: Planning and SUDS, 2001.<br>Scottish Government (2017) Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity Generation Developments.<br>Scottish Planning Policy (SPP) 2014.<br>Water Environment and Water Services (Scotland) Act 2003.<br>The Flood Risk Management (Scotland) Act 2009<br>The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations, 2017.<br>The Public and Private Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2017.<br>The Pollution Prevention and Control (Scotland) Regulations, 2000. |
| **Retained EU Legislation** | Freshwater Fish Directive 2006/44/EC.<br>Water Framework Directive (WFD) 2000/60/EC.<br>Dangerous Substances Directive 76/464/EEC. |

## 9.3 Method of Assessment and Reporting

4. The assessment of the potential impact of the proposal on hydrology and hydrogeology was carried out by the general method described in the following sections.

### 9.3.1 Determination of Study Area

5. A conservative study area of 1km was established around the proposed infrastructure locations and working corridor of the cable routes; it is expected that a working corridor of approximately 100m will be required around the proposed cable routes.

### 9.3.2 Desk Study Assessment Methodology

6. It is important to initially establish the baseline conditions so that an accurate hydrological context map can be developed for the study area.
7. The baseline will identify any features that have the potential to be impacted by the proposed onshore development (Figures 9.1 and 9.2). This can then be used to inform the final cable route and substation design. The study area will be reviewed and amended in response to refinement of design options and the identification of additional impact pathways, and in response to feedback from scoping consultation. The following sources of information will be consulted as part of the desk study:
    - Draft layout including all associated infrastructure;
    - Surface and groundwater information, including local water quality and any relevant groundwater level data, will be obtained from SEPA;
    - Ground conditions will be initially determined using published geology maps and site-specific geology information will be obtained from the British Geological Survey (BGS);
    - Hydrogeological information will be obtained from the BGS;
    - Information relating to private water supplies will be obtained from Aberdeenshire Council;
    - Public water supply information and infrastructure will be obtained from Scottish Water; and
    - NatureScot's Carbon and Peatland 2016 mapping.
8. The desk study will also include a review of relevant historical maps, soil maps and aerial photographs.

### 9.3.3 Field Survey Methodology

9. Following the desk study and initial concept of the study area, a site visit will be undertaken across the study area and the following actions carried out:
    - Verification of any information collected during the desk study;
    - Establishment of a first-hand understanding of the study area, including watercourses and ground conditions, to assess the relative location of all the components of the Proposed Development ; and
    - Identification of any potential constraints to the Proposed Development from the topography and ground conditions.
10. A National Vegetation Classification (NVC) survey for the study area will be used to screen for the potential presence of Ground Water Dependent Terrestrial Ecosystems (GWDTEs). Areas of potential High and Moderate GWDTE will be investigated to assess whether they are sustained by groundwater as part of the field work.

### 9.3.4 Consultation

11. Consultation will be carried out with:
    - SEPA;
    - NatureScot;
    - River Ythan Trust;
    - Ugie River Salmon Fishery Board;
    - Peterhead Port Authority;
    - Aberdeenshire Council; and

- Scottish Water.

### 9.3.5 Assessment Criteria

12. The criteria set out in the Tables below will be used in the assessment of any potential effects of the Proposed Development on geology, hydrology, and hydrogeology. With the baseline established, sensitive receptors can be determined. Table 9.2 outlines the various factors considered when assessing the sensitivity of a variety of receptors.

**Table 9.2 – Sensitivity Table**

| Sensitivity | Definition |
|---|---|
| High | Receptor of high quality, rarity of a regional or national scale, and limited potential for substitution or replacement. This Includes:<br>• Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA) or Special Area of Conservation (SAC);<br>• SEPA Water Quality defined as High;<br>• Abstraction for public;<br>• Private water supplies – 0 to 100m from construction activities;<br>• Designated salmonid fishery and/or salmonid spawning grounds present;<br>• Watercourse widely used for recreation, directly related to watercourse quality (e.g. swimming, salmon fishery) <1.2km downstream of development;<br>• Active flood plain area (important in relation to flood defence);<br>• Groundwater - public drinking water supply;<br>• Groundwater aquifer vulnerability classed 5 in the SEPA vulnerability classification scheme;<br>• Geology that is rare or of national importance as defined by SSSI or Regional Important Geological Site (RIGS);<br>• Groundwater dependent terrestrial ecosystems (GWDTE) defined as Class 1;<br>• Peat Slide Risk likelihood of 'probable' or 'almost certain'. |
| Medium | Receptor of medium quality, rarity of a local scale, and limited potential for substitution/replacement. Or a receptor of medium quality and rarity of regional or national scale, and limited potential for substitution/replacement. This includes:<br>• SEPA Water Quality defined as Good;<br>• Surface water abstractions for private water supply for more than fifteen people;<br>• Private Water Supplies – Surface water abstractions within 100–600m of construction activities, groundwater spring abstractions within 100–400m of construction activities, and groundwater borehole abstractions within 0– 200m of construction activities;<br>• Designated salmonid fishery and/or cyprinid fishery;<br>• Watercourse widely used for recreation, directly related to watercourse quality (e.g. swimming, salmon fishery) >1.2km downstream of development;<br>• Groundwater aquifer vulnerability classed as 4d, 4c, 4b, 4a in the SEPA vulnerability classification scheme;<br>• Groundwater dependent terrestrial ecosystems (GWDTE) defined as Class 2, and/or defined as 'Medium Conservation Value' by Ecologist;<br>• Peat Slide Risk of 'Likely'. |
| Low | Receptor of low quality, rarity of a local scale, and limited potential for substitution/replacement. Or a receptor of low quality, rarity of a regional or national scale, and limited potential for substitution/replacement. This includes:<br>• SEPA Water Quality defined as Moderate or Poor;<br>• Occasional or local recreation (e.g. local angling clubs);<br>• Conveyance of flow and material, main river <10 m wide or ordinary watercourse >5 m wide;<br>• Existing flood defences;<br>• Private Water Supplies – Surface water abstractions >600m from construction activities, groundwater spring abstractions within 400–800m of construction activities, and groundwater borehole abstractions within 200–600 m of construction activities;<br>• May be subject to improvement plans by SEPA;<br>• Designated cyprinid fishery, salmonid species may be present and catchment locally important for fisheries;<br>• Watercourse not widely used for recreation, or recreation use not directly related to watercourse quality;<br>• Groundwater aquifer vulnerability classed as 2 and/or 3 in the SEPA vulnerability classification scheme;<br>• Groundwater dependent terrestrial ecosystems (GWDTE) defined as Class 3, and/or defined as 'Local Conservation Importance' by Ecologist;<br>• Peat Slide Risk of 'Unlikely'. |

| | |
|---|---|
| Negligible | Receptor of low quality, rarity of a local scale, and limited potential for substitution/replacement. Environmental equilibrium is stable and is resilient to changes that are greater than natural fluctuations, without detriment to its present character. This includes:<br>• SEPA water quality defined as Bad;<br>• Fish sporadically present or restricted, no designated features;<br>• Receptors not used for recreation, e.g. no clubs or access route associated with watercourse;<br>• Watercourse <5 m wide – flow conveyance capacity of watercourse low - very limited floodplain as defined by topography, historical information and SEPA flood map;<br>• Private Water Supplies – groundwater spring abstraction >800 m from construction activities, and groundwater borehole abstractions >600 m from construction activities;<br>• No public drinking water supplies;<br>• Groundwater aquifer vulnerability classed as 1 in the SEPA vulnerability classification scheme;<br>• Receptor heavily engineered or artificially modified and may dry up during summer months;<br>• Geology not designated under a SSSI or RIGS or protected by specific guidance;<br>• Peat Slide Risk of 'Negligible'. |

13. The significance of each impact on a receptor is based on its magnitude. The magnitude of impact includes the timing, scale, size and duration of the potential impact. For the purposes of this assessment the magnitude criteria are defined in Table 9.3.

### Table 9.3 - Magnitude of Impact Table

| Magnitude | Criteria | Description and Example |
|---|---|---|
| Large | Results in loss of attribute | • Fundamental (long term or permanent) changes to geology, hydrology, water quality and hydrogeology;<br>• Loss of designated Salmonid Fishery;<br>• Loss of national level designated species/habitats;<br>• Changes in WFD water quality status of river reach;<br>• Loss flood storage/increased flood risk;<br>• Pollution of potable source of abstraction compared to pre-development conditions. |
| Medium | Results in impact on integrity of attribute or loss of part of attribute | • Material but non-fundamental and short to medium term changes to the geology, hydrology, water quality and hydrogeology;<br>• Loss in productivity of a fishery;<br>• Contribution of a significant proportion of the discharges in the receiving water, but insignificant enough to change its water quality status; |
| Small | Results in minor impact on attribute | • Detectable but non-material and transitory changes to the geology, hydrology, water quality and hydrogeology; |
| Negligible | Results in an impact on attribute but of insufficient magnitude to affect the use/integrity | • No perceptible changes to the geology, hydrology, water quality and hydrogeology;<br>• Discharges to watercourse but no loss in quality, fishery productivity or biodiversity;<br>• No significant impact on the economic value of the receptor;<br>• No increase in flood risk. |

14. The sensitivity of the receptor together with the magnitude of impact defines the significance of the impact as outlined below in Table 9.4.

### Table 9.4 - Significance of Impact Matrix

| Sensitivity | Magnitude | | | |
|---|---|---|---|---|
| | Large | Medium | Small | Negligible |
| High | Major | Major | Moderate | Negligible |
| Medium | Major | Moderate | Minor | Negligible |

| | | | | |
|---|---|---|---|---|
| Low | Moderate | Minor | Minor | Negligible |
| Negligible | Negligible | Negligible | Negligible | Negligible |

15. Where the significance of an impact is defined to be minor, moderate, or major - mitigation is required to reduce those impacts to acceptable levels.

## 9.4 Preliminary Baseline

### 9.4.1 Preliminary Baseline Conditions

16. To facilitate the connection of the proposed wind farm to the national grid, a new buried cable will be required to connect the joint bay to a new substation at New Deer, Aberdeenshire. The onshore options for the Proposed Development are discussed in further detail within **Section 2.4 – the Proposed Development.**

17. The preferred working corridor for the cable route and associated infrastructure will run for approximately 25 km from its onshore arrival point at either Boddam or St Fergus, to the indicative substation locations near New Deer (**see Figures 9.1** and **9.2**). The study area covers a 1km buffer zone around the proposed working corridor options.

18. The land use within the study area is dominated by agriculture, however, there are some small patches of forestry, several settlements, and scattered residential properties. Upperton Industrial Estate and the Peterhead SSE power station are situated within the southeast of the study area, adjacent to the identified joint bay opportunities at Boddum.

19. The topography of the study area predominantly consists of gently undulating hills that range from approximately 20-150m AOD. The land falls to the east of the study area to form the coastal cliffs and dunes near St Fergus, and the sandy beach at Sandford Bay.

### 9.4.2 Geology

20. The British Geological Survey (BGS) 1:50,000 map indicates that the eastern region of the study area is predominantly underlain with Crinan subgroup and Tayvallich subgroup that are formed of semipelite, pelite and psammite sedimentary rock. This bedrock is occasionally intersected by areas of Forest of Deer Pluton igneous bedrock, sedimentary bedrock of the Collieston Formation, and igneous bedrock of the north-east Grampian Granitic Suite. Further toward the coastline, the eastern region of the study area is mostly underlain by Peterhead Pluton granite.

21. Metagreywacke is predominant throughout the western region of the study area, and is comprised of interbedded psammite and semipelite with subsidiary pelite of the Macduff Formation. This bedrock is divided by Maud Pluton of the North-East Grampian Basic Suite, comprised of Gabbroic rock. Along the western study area, there is also a pocket of foliated-biotite metamelagranite that forms the North-East Grampian Granitic Suite, a linear section of Quartz-microgabbro of the North Britain Late Carboniferous Tholeiitic Suite, and a small area of Porphyritic felsite which forms part of the North Britain Siluro-devonian Calc-alkaline Dyke Suite. A small area of cobble gravel, flint and white quartzite that forms the Buchan Ridge Gravel Member of the Buchan Gravel formation also spans into the southeastern region of the study area.

22. The superficial geology information within the study area was obtained from the 1:50,000 BGS mapping. The Banchory Till Formation is the most predominant superficial deposit within the study area. This gravelly and sandy diamicton is primarily composed of Neoproterozoic metamorphic rocks and Caledonian igneous rocks.

23. Alluvium deposits were identified at various locations within the study area, comprising silt, clay, sand, and gravel. In general, these deposits are located following or adjacent to a watercourse. Several outcrops of Glaciofluvial Sheet Deposits were identified within the northern region of the study area. These superficial deposits are commonly formed of sand, gravel, silt, clay or organic material. An outcrop of head deposit was

identified within the southeastern region of the study area, which is a polymict deposit and is described as comprising gravel, sand, and clay, depending on the upslope source and the distance from the source. This head deposit is intersected by isolated pockets of peat and Glaciofluvial Ice Contact Deposits, which consists of stratified sand, gravel and interbedded diamicton deposited by meltwater and ice glaciers. Diamicton, clay, sand and gravel of the Hatton Till formation become dominant towards the east of the study area, with some smaller areas of blown sand and marine beach deposits confined to the coastline.

### 9.4.3 Soil and Peatland

24. The National Soil Map of Scotland identified the main soil type within the study area as Mineral gleys, Mineral podzols, and brown soils, as shown in **Figure 9.3**. The centre of the study area is dominated by brown soils, whilst the mineral gleys become more prevalent towards the coastline. Immature soils and peaty gley are confined to two isolated strips adjacent to the coastline at St Fergus. Alluvial soils have also been identified at various locations, and one deposit of peaty gley is located within the southern region of the study area.
25. A review of the Carbon and Peatland Map 2016 identified several isolated pockets of Class 1 peat throughout the study area, although in greater concentration within the southeastern region as shown in **Figures 9.1** and **9.2**. Class 1 peats are nationally important carbon-rich soils that are likely to be of high conservation value. The Class 1 peat is located outwith all the proposed working corridors, except for a small area that encroaches onto the proposed 100m corridor for Route 3 at Nether Kinmundy.
26. The study area is mostly underlain with mineral soils (no peatland vegetation), however there are also some small pockets of Class 3 peat (predominantly peaty soil with some peat soil), Class 4 peat (Predominantly mineral soil with some peat soil), and some areas of Class 5 peat (no peatland vegetation) which is primarily located adjacent to the Class 1 peatland.

### 9.4.4 Hydrogeology

27. The BGS Aquifer Classification Dataset for Scotland classifies the potential for bedrock to supply groundwater and describes the potential groundwater flow mechanism.
28. The various bedrock underlying the study area can largely be classed as a low productivity aquifer in which groundwater generally flows through fractures and other discontinuities with fracture flows varying between 0.1 to 1 l/s.
29. The only exception to this is a small area of Buchan Ridge Gravel Member that spans into the southeastern region of the study area and is situated approximately 180m to the south of the proposed working corridor for Route 1 at its closest point. The sedimentary rocks are classified as a moderately productive aquifer with singular intergranular groundwater flow. These aquifers can generally yield up to 5 l/s of potable, but often ferruginous, water.
30. SEPA have classified the quality of all groundwater bodies in Scotland under the Water Framework Directive (WFD). This map informs that most of the study area is located upon the Mintlaw groundwater unit, with the most easterly region sited on the Peterhead unit, and the most westerly area situated on the Ellon unit.
31. SEPA have classified both the Mintlaw and Peterhead groundwater units as having an overall status of “Good” in 2019 with no limiting parameters. However, the Ellon unit, which surrounds the proposed substations at New Deer, was classified as having an overall status of “Poor” due to its chemical status.

### 9.4.5 Designated sites

32. There is one ecologically designated site located within the study area. The Buchan Ness to Collieston Coast Special Protection Area (SPA) is situated c.380m from the proposed joint bays at Boddam at its closest point. This designated site spans the eastern coast of Aberdeenshire from Sandford Bay to Newburgh and is noted for supporting various populations of breeding seabirds.

### 9.4.6 Surface Water Hydrology

33. There are numerous watercourses located within the study area; these form part of the River Ythan and the River Ugie Catchments. The eastern boundary of the study area also spans across two coastal waterbodies, the 'Cairnbulg Point to the Ugie Estuary' to the north and the 'Ugie Estuary to Buchan Ness (Peterhead)' coastal water to the south. The Peterhead (Lido) bathing water catchment at Peterhead Bay Marina lies a short distance outwith the study area; there are no bathing water catchments within the study area.

34. SEPA have classified the surface water quality of all significant waterbodies in Scotland under the Water Framework Directive (WFD) (2019). The WFD named watercourses identified within the study area have been recorded in Table 9.5, along with their overall classification, and potential number of watercourse crossings. It is important to note that the indicative number of water crossings is based upon the four potential cable routes taken presented within this scoping request. This final design will only comprise one cable route, which will reduce the number of required watercourse crossings.

35. There are also a number of unnamed burns and agricultural drains within the study area that are not classified by SEPA. These watercourses will be included within any further assessments along the finalised cable route.

**Table 9.5 - SEPA classifications of the WFD-named waterbodies within the study area.**

| Name & ID | Catchment | No of Potential Watercourse Crossings | | | | Overall Status | Limiting Parameters |
|---|---|---|---|---|---|---|---|
| | | R1 | R2 | R3 | R4 | | |
| Little Water / Black Burn (23237) | River Ythan | 2 | 1 | 1 | 1 | Moderate | Ecology & Hydromorphology |
| Ebrie Burn (23240) | River Ythan | 0 | 0 | 0 | 0 | Poor | Ecology & Hydromorphology |
| Crichie Burn (23227) | River Ugie | 0 | 1 | 0 | 0 | Bad | Pre-Heavily Modified Water Body (HMWB), Ecology, & Hydromorphology |
| South Ugie Water - Stuartfield to Longside (23224) | River Ugie | 0 | 1 | 0 | 1 | Moderate | Pre-HMWB & Ecology |
| Quhomery Burn (23226) | River Ugie | 1 | 0 | 1 | 1 | Moderate | Pre-HMWB, Ecology, & Hydromorphology |
| Burn of Ludquharn (23225) | River Ugie | 1 | 0 | 1 | 1 | Moderate | Pre-HMWB, Ecology, & Hydromorphology |
| North Ugie Water - lower catchment (23221) | River Ugie | 0 | 1 | 0 | 0 | Moderate | Pre-HMWB, Ecology, & Hydromorphology |
| Faichfield Burn (23217) | River Ugie | 2 | 0 | 1 | 1 | Moderate | Pre-HMWB, Ecology, & Hydromorphology |
| River Ugie - North/South confluence to tidal limit (23215) | River Ugie | 0 | 0 | 0 | 1 | Poor | Pre-HMWB & Ecology |
| Crooko Burn (23216) | River Ugie | 0 | 1 | 0 | 0 | Good | Pre-HMWB, Ecology, & Hydromorphology |
| Laeca Burn (23202) | Buchan Coastal | 0 | 0 | 0 | 0 | Good | Pre-HMWB, Ecology, & Hydromorphology |
| Ugie Estuary to Buchan Ness (Peterhead) (200131) | N/A | N/A | N/A | N/A | N/A | Good | Pre-HMWB, Ecology, & Hydromorphology |
| Cairnbulg Point to the Ugie Estuary (200 | N/A | N/A | N/A | N/A | N/A | High | None |

### 9.4.7 Flood Risk

36. SEPA's Flood Hazard and Risk Map illustrates the indicative flood extents of high likelihood (1 in 10-year probability), medium likelihood (1 in 100-year probability), or low likelihood (1 in 200-year probability) of coastal, surface, and river floods.
37. Within the study area, SEPA's Map identifies that the watercourses identified in Table 9.5 are all at high risk of river flooding. These flood extents are largely confined to the watercourse channel, except for the 'South Ugie Water - Stuartfield to Longside' stretch of river which has a greater flood extent.
38. The map also indicates a high likelihood of surface water flooding within the study area, which is generally localised to the small unnamed burns, agricultural drains, and drainage ponds. These flood risks are generally identified more frequently towards the coastline. However, there are also some areas of high surface flood risk at various locations along the 'South Ugie Water - Stuartfield to Longside' stretch of river and the 'River Ugie - North/South confluence to tidal limit' stretch of river.
39. Coastal flooding within the study area is largely confined to the coastline at Sandford Bay and St Fergus, where there is noted to be a high likelihood of flooding.
40. There are no 'Potentially Vulnerable Areas' noted within the Study Area, i.e., no potential impacts of flooding on potentially vulnerable areas of people, properties, community services and specific environmental sites.

### 9.4.8 Potentially Sensitive Receptors

41. The Buchan Ness to Collieston Coast SPA is situated approximately 380m south of the Proposed Development at its closest point. The topography within the study area dictates that any runoff from the proposed joint bays at Boddam will run towards the designated site at Sandford Bay however, the runoff will also have to pass across the A90 or through the Peterhead power station. Both infrastructures will have existing drainage in place that will capture any runoff from the Proposed Development before it reaches the Buchan Ness to Collieston Coast SPA. It is also worth noting that if the final design incorporates one of the proposed joint bays at St Fergus, then the Proposed Development will be approximately 5.6km from the designated site at its closest point. Thus, designated sites will not be included as a sensitive receptor.
42. Several pockets of Class 1 peat have been identified within the study area, these are of national importance and conservation value. Peat has the potential to be degraded during construction activities however, the majority of the Class 1 peat is located outwith the proposed working corridors, except for a small area that encroaches onto the 100m proposed corridor for Route 3 at Nether Kinmundy, and any excavation work for the cable route will be temporary. Thus, considering the proximity, timescale, and dilution factor, Class 1 Peat will not be included as a sensitive receptor.
43. Several waterbodies are susceptible to runoff from the Proposed Development and could potentially be at risk of adverse impacts to water quality, ecology, or geomorphology. The watercourses form part of the River Ythan and the River Ugie Catchments, which are known to have salmon and sea trout present, and the study area also encounters two coastal waterbodies. The watercourses and coastal waterbodies will be treated as sensitive receptors and form a focus of the hydrological assessment. The assessment of the watercourses will be determined by the final cable route.
44. Should the ecological surveys identify any groundwater dependent terrestrial ecosystems (GWDTE) in the study area, these will be treated as sensitive receptors in the EIA.
45. It is not currently known whether there are any private water supplies (PWS) located within the proposed 1km study area. Should any PWS be identified, these will be treated as sensitive receptors in the EIA.

### 9.4.9 Potential Impacts

46. The potential impacts this development may have on the water environment of the study area and the surrounding area are likely to include:
    - Disruption to the surface and subsurface runoff and watercourses;
    - Increased flood risk to areas downstream;
    - Sedimentation, erosion, and silt-laden runoff;
    - Chemical pollution of watercourses or groundwater;
    - Increase in run-off; and
    - Drop in the water table.

## 9.5 Assessment and Mitigation

### 9.5.1 Assessment of Effects

47. Potential impacts on the water and ground environment, including environmental receptors dependent upon these resources, will be identified.
48. A qualitative risk assessment will be used to assess potential impacts on the identified receptors in which the probability of an effect occurring and the magnitude of the effect, if it were to occur, are considered. This approach provides an established process for identifying the areas where mitigation measures are required. This allows efforts to be focussed on reducing risk where the utmost benefit may result.
49. Mitigation measures required to address these impacts will be proposed in accordance with best practice guidance.
50. The assessment will consider the construction, operational, and decommissioning stages of the Proposed Development .

### 9.5.2 Mitigation

51. Mitigation measures, where required, will be identified and based on best practice techniques appropriate to site conditions. It is foreseen that the following types of measures could be relevant:
    - Avoidance of sensitive areas;
    - Appropriate location of proposed onshore infrastructure;
    - The implementation of general pollution prevention measures to protect the water quality of the surrounding waterbodies and groundwater; and
    - Suitable surface water management and appropriate design of drainage features.

## 9.6 Summary

52. Given the presence of sensitive coastal waterbodies and watercourses, and the potential for GWDTEs and PWSs, there is potential for significant hydrological effects to occur during the construction, operational and decommissioning phases of the development. As such, these sensitive receptors will be scoped in to the hydrological assessment undertaken to inform the EIAR.
53. Given the information set out in Section 9.4.8, Designated sites and Class 1 peat will be scoped out of the hydrological assessment undertaken to inform the EIAR.

## 9.7 Key Questions for the Council / Consultees

- Q9/1: Do the Council and Consultees agree with the proposed methodology?
- Q9/2: Do the Council and Consultees agree with the proposed study area of 1km from the working corridor?
- Q9/3: Do the Council and Consultees have any further information that would assist in the preparation of the assessments?
- Q9/4: Are the Council or Consultees aware of any further guidance or policy documents not mentioned within the report that are relevant to the assessment?
- Q9/5: Do the Council and Consultees agree with scoping in sensitive water courses and coastal waterbodies, PWS, and GWDTEs?
- Q9/6: Do the Council and Consultees agree with scoping out Class 1 peat and designated sites?

# 10 Air Quality

## 10.1 Introduction

1. This section of the report assesses potential for air quality impacts as a result of the Proposed Development . Potential impacts are limited to emissions of dust and particulate matter during the construction phase and increased traffic flows during construction. Impacts relevant to both human receptors and ecological receptors will be considered.

## 10.2 Guidance

2. The Scottish Government has set out standards and objectives for several pollutants that may be harmful to human health or to vegetation and ecosystems[22]. Table 10.1 shows the relevant objectives.

**Table 10.1 - Relevant Scottish Air Quality Objectives for protection of human health and vegetation/ecosystems.**

| Pollutant | Concentration | Measured as |
|---|---|---|
| **Nitrogen Dioxide ($NO_2$)** | 200 µg $m^{-3}$ not to be exceeded more than 18 times a year | 1-hour mean |
| | 40 µg $m^{-3}$ | Annual mean |
| **Particles ($PM_{10}$)** | 50 µg $m^{-3}$, not to be exceeded more than 7 times a year | 24 Hour mean |
| | 18 µg $m^{-3}$ | Annual mean |
| **Oxides of Nitrogen ($NO_X$) – for protection of vegetation and ecosystems only** | 30 µg $m^{-3}$ | Annual mean |

3. The following sources provide relevant guidance on carrying out air quality assessments:
   - IAQM – Land-Use Planning & Development Control: Planning For Air Quality[23]
   - DEFRA – LAQM.TG(16)[24]
   - IAQM – Guidance on the assessment of dust from demolition and construction[25]

## 10.3 Baseline

4. Air quality is generally good in Aberdeenshire; there are no exceedances of national objectives and no Air Quality Management Areas (AQMAs)[26].
5. Aberdeenshire Council has no automatic monitoring stations and 11 diffusion tube sites monitoring $NO_2$. The nearest of these to the development locations are the four diffusion tubes in Peterhead. The highest annual mean concentration of $NO_2$ measured in Peterhead in 2019 was 19.9µg/$m^3$, which is significantly below the annual mean objective of 40µg/$m^3$. The proposed cable routes mostly fall within rural areas where air quality is expected to be higher than in Peterhead.

[22] Air Quality in Scotland (2021), 'Standards', http://www.scottishairquality.scot/air-quality/standards.
[23] IAQM (2017), 'Land-Use Planning & Development Control: Planning For Air Quality'.
[24] DEFRA (2021), 'Local Air Quality Management Technical Guidance (TG16)'.
[25] IAQM (2014), 'Guidance on the assessment of dust from demolition and construction'.
[26] Aberdeenshire Council (2020), '2020 Air Quality Annual Progress Report (APR) for Aberdeenshire Council'.

6. No particulate matter ($PM_{10}$) monitoring is currently carried out in Aberdeenshire. In the absence of monitoring data in the vicinity of the proposed cable routes and substation option areas, annual mean background concentrations of relevant pollutants have been sourced from Air Quality in Scotland background maps[27] for the year of 2020 and are provided in Table 10.2.

**Table 10.2 - Background concentrations of $NO_2$, $NO_X$, and $PM_{10}$.**

| Pollutant | Maximum Annual Mean Background Concentration along proposed cable routes |
|---|---|
| $NO_2$ | 6.3 µg $m^{-3}$ |
| $NO_X$ | 9.0 µg m-3 |
| $PM_{10}$ | 11.2 µg m-3 |

## 10.4 Potential Sources of Impacts

7. Sources of emissions with a potential impact on air quality have been identified as follows:
   - Construction and decommissioning phases
     - Dust and PM10 emissions
     - NO2 and NOX emissions from construction traffic and equipment
8. No emissions are expected during the operational phase.

## 10.5 Methodology

### 10.5.1 Construction and decommissioning phase dust

9. The IAQM guidance suggests carrying out a construction dust assessment where there is a human receptor within 350m of the site boundary or an ecological receptor within 50m of the site boundary. A number of residential properties are within 350m of the proposed cable routes. No dust-sensitive ecological sites have been identified within 50m of the construction boundaries. It is, therefore, anticipated that an air quality impact assessment for construction dust will be required.
10. A qualitative construction dust assessment will be conducted using the IAQM 'Guidance on the assessment of dust from demolition and construction' methodology. This will determine the activities being carried out that may release dust. The risk of dust impacts for each process will be assessed based on the potential dust emission magnitude and sensitivity of the area. Appropriate mitigation measures will be determined, and the significance of effects identified after mitigation.
11. The IAQM guidance states that mitigation measures should ensure that significant adverse effects do not occur, therefore, no significant effects are expected after mitigation.

### 10.5.2 Construction and decommissioning phase traffic

12. During the construction phase, pollutants will be emitted via vehicle exhaust from on-site plant and site traffic. It is not expected that the modest increase in vehicle movements will have any impact on the current level of air quality in the local areas.

[27] Air Quality in Scotland (2020), 'Data for Local Authority Review and Assessment purposes', http://www.scottishairquality.scot/data/mapping?view=data

### 10.5.3 Operational phase dust

13. Operational phase emissions will be limited to minor dust emissions during maintenance activities. It is not expected that these activities will have any impact on the air quality in the local areas.

## 10.6 Summary

14. Given the proximity of residential properties, a qualitative construction dust assessment will be scoped in to the EIA.
15. The modest increase in vehicle movements during construction is not expected to have any impact on air quality, therefore, an air quality impact assessment for construction traffic can be scoped out.
16. Operational phase emissions will be minimal and limited to maintenance activities, therefore an operational dust assessment can be scoped out.

## 10.7 Key Questions for Council and Consultees

- Q10/1: Do the consultees agree that air quality impact assessments for construction traffic and operational dust are not required?
- Q10/2: Do the Council and consultees agree with the proposed methodology for construction dust assessment?

# 11 Other Considerations

1. This section addresses any other issues which require consideration but have not been covered in a separate section of the Scoping Report and includes the following aspects:
   - Public Rights of Way/Core Path Assessment
   - Traffic and Transport
   - Agricultural Land
2. Through standard methods of assessment, predicted effects for these issues will be judged as either significant or not significant.

## 11.1 Public Rights of Way/Core Path Assessment

### 11.1.1 Introduction

3. The assessment will include consideration of pedestrians, cyclists, equestrians and other recreational users who use the area within the route corridor and whom may be directly affected during the construction or operation phases.

### 11.1.2 Methodology

4. In order to assess the potential impacts on the users of the recreational routes, information from relevant guidance and mapping will be used to create a baseline of public rights of way and core paths in the area.
5. In order to assess potential effects on users, information will be gathered from:
   - The Scottish Outdoor Access Code 28
   - Aberdeenshire Council Core Path Plan (2013)29
   - nestrans- Documents – Cycling, Walking & Safety30

### 11.1.3 Potential Effects

6. Potential type of effects associated with the construction and/or operation of the onshore works include:
   - Direct effects on recreational amenity during construction of the Works;
   - Direct effects on Rights of Way, Core Paths, other paths and other recreational sites within the route corridor during construction;
7. Given the linear nature of the Development, it is neither possible nor practical to avoid crossing all footpaths and walkways along the length of the route. The proposed routes cross the Formartine and Buchan Way twice; on the five-mile segment Auchnagatt to Maud and the six-mile segment Longside to Peterhead. Open trenching will be used for laying the cables; however, mitigation will be implemented during the installation phase to limit disruption to the paths.
8. A maximum duration of two days per crossing is anticipated to allow for backfilling and reinstatement. It is not expected that diversions will be necessary given the short section of track affected, however, if required, these will be agreed with the council prior to the commencement of any works.

[28] Scottish Outdoor Access Code - Public access to Scotland's outdoors
[29] Aberdeenshire Council Core Path Plan (2013)
[30] nestrans - Documents – Cycling, Walking & Safety

### 11.1.4 Mitigation

9. Appropriate signage will be installed as necessary with temporary fencing to provide adequate separation between installation between installation traffic and recreational users. Any temporary rerouting of the core path routes will comply with Planning Advice, N0 10/2015 Outdoor Access & Development[31].

### 11.1.5 Consultation

10. Consultations will include the following stakeholders:
    - Recreational and community groups;
    - The Scottish Rights of Way and Access Society; and
    - The British Horse Society.

### 11.1.6 Conclusion

11. No significant effects on Public Rights of Way or Core Paths are anticipated and it is considered that these assessments should be **scoped out** of any future EIAR.

## 11.2 Traffic and Transport

12. This assessment will identify the preferred routes for access along the route corridor and will consider the potential effects of traffic generated during construction and operation of the works, including identification of measures to minimise any disruption to the local and strategic road network.

### 11.2.1 Method of Assessment

13. The study area for the traffic and transport assessment will be the public road network in the vicinity of the works, which will be used during construction. Traffic count data will be sourced from Transport Scotland and Aberdeenshire Council to inform the assessment if available. The assessment of effects on traffic and transport will be carried out in line with the following guidance:
    - Aberdeenshire Local Development Plan 2017;
    - Scottish Planning Policy 2020; and
    - The Transport Assessment Guidance. Transport Scotland (2012).

### 11.2.2 Baseline

14. The main road in the area is the A90 which runs around Peterhead (north-south) and the A952 which runs through Mintlaw (north-south). Linking the roads in the A950 which runs west from Peterhead through Mintlaw.
15. Most of the road network within the vicinity of the works comprise “B” or unnamed roads which provide links for the small settlements and individual properties to the wider network.

### 11.2.3 Potential Effects

16. Taking account of the findings of the work undertaken to date, whilst still adopting a precautionary approach at this preliminary stage, potential effects associated with the construction and/or operation of the works include effects of construction traffic on existing traffic flows and the public road network.

[31] https://www.aberdeenshire.gov.uk/media/19597/2015_10-outdoor-access-and-development.pdf

#### 11.2.4 Potential Mitigation and Monitoring

17. Commitment will be made to implement accepted good practice during construction, operation and maintenance of the works thereby ensuring that potential effects on traffic and transport can be avoided or reduced.

18. Where potentially significant effects on traffic and transport are identified, measures to prevent, reduce and where possible offset these adverse effects will be proposed. Measures likely to be utilised include:

- Instructing abnormal loads, Heavy Goods Vehicles (HGVs), and site personnel as appropriate, to use only the approved access routes to the site;
- Ensuring appropriate diversions are in place during construction if necessary to allow for continued access to homes and businesses including the transport of heavy goods and emergency vehicles;
- Scheduling works out with hours of peak activity on local roads when possible;
- Development of a travel plan to encourage sustainable transport during the construction phase (e.g. multi occupancy of site staff vehicles, use of minibuses etc.);
- Use of appropriate boring/drilling techniques to avoid impacts on rail and road infrastructure; and
- Timing of construction works to avoid disturbance to road traffic

#### 11.2.5 Consultation

19. Transport Scotland and Aberdeenshire Council will be approached for information to inform the forthcoming planning application.

#### 11.2.6 Conclusion

20. No significant adverse effects are anticipated from the movement of materials, plant and personnel. A range of mitigation measures are available that can further address potential impacts on the road network. As such it is considered appropriate for Traffic and Transport to be scoped out of any EIA.

## 11.3 Agricultural Land

#### 11.3.1 Introduction

21. This section sets out the proposed approach to the assessment of potential effects of the onshore works on soils, agriculture and land use during both construction and operation. It will consider soil quality in relation to land capability for agriculture or forestry. Soil issues in relation to ground conditions and geology are considered in Chapter 9.

22. National planning policy on agriculture is set out in the Scottish Government's Scottish Planning Policy (SPP). This re-affirms previous commitments to the protection of the best and most versatile agricultural land for productive agricultural uses. The policy also draws stronger linkages between land use, agriculture, sustainability, renewable energy and climate change.

23. A number of recent strategies published by the Scottish Government and other agencies also highlight the importance of agriculture, soils and forestry in helping to achieve the Government's priorities for sustainable economic growth. Those which deal specifically or extensively with such land uses, and which would be taken account of in the assessment, include the following:

- A Future Strategy for Scottish Agriculture (2018);
- The Scottish Soil Framework (2009);
- The Scottish Forestry Strategy 2019- 2029 (2019);

- Land Use Strategy for Scotland (2021);
- and The Scottish Outdoor Access Code (2018)

24. The protection of soils, prevention of diffuse pollution and controls over application of nutrients to soils are all issues which cut across the work of other agencies such as NatureScot and SEPA. Relevant guidance from these bodies, for example relating to Nitrate Vulnerable Zones and Controlled Activities Regulations would also be considered in the assessment of impacts on land use and soils.

### 11.3.2 Method of Assessment

25. The assessment will focus on potential effects on land uses, agricultural activity and soils directly affected by the proposed onshore works and will include the following:
    - Identification of data on Land Capability for Agriculture, from published sources;
    - A review of other desk top sources on soil quality, extent etc. (e.g. Soils Maps); and
    - Field surveys and interviews with agricultural land interests to collect baseline information on farm type, agricultural activity and sporting interests
26. Land Capability for Agriculture is classified in Scotland in seven classes ranging from Class 7 which is land of very limited agricultural value to Class 1 which is capable of producing a very wide range of crops. Land in classes 1, 2 and 3.1 is capable of supporting arable agriculture.
27. The assessment will focus on potential effects on land uses, agricultural activity and soils directly affected by the proposed onshore works and will include the following:
    - Identification of data on Land Capability for Agriculture, from published sources;
    - A review of other desk top sources on soil quality, extent etc. (e.g. Soils Maps); and
    - Field surveys and interviews with agricultural land interests to collect baseline information on farm type, agricultural activity and sporting interests.
28. Following established good practice, the assessment will seek to minimise the area of forestry included in the application in order to minimise woodland impacts.
29. The routes identified for the cables avoids the removal of trees and forestry as far as possible, by following existing rides where the route runs through forested areas. Trees will be protected during installation in accordance with BS 5837:201232.
30. In line with Aberdeenshire Forestry and Woodland Strategy 201633 it is intended that compensatory planting of woodland will be provided within Aberdeenshire. It is anticipated that a Compensatory Planting Plan will be required to be submitted to the Council prior to commencement of any works.
31. Areas of woodland removal arising as a result of the Proposed Development would be identified, quantified and detailed as part of this assessment.
32. Potential impacts may include changes to commercial forest layout as a result of premature harvesting of timber and impacts on coupe design or timber production. Given the absence of essential infrastructure footprints associated with Proposed Development, there will be no forestry removal associated with such features.

[32] https://beta.bathnes.gov.uk/sites/default/files/2020-01/BS5837%202012%20Trees.pdf (accessed 17/09/2021)

[33] https://www.aberdeenshire.gov.uk/media/15632/2016-0003845-2016-02-04-proposed-aberdeenshire-forestry-and-woodland-strategy-2016.pdf (accessed 17/09/2021)

33. Where impacts are unavoidable, mitigation will include the development of revised forestry proposals in consultation with the landowners and these will be summarised in the final submission.

### 11.3.3 Baseline

34. Key land uses along the route corridor include agriculture and forestry. The proposed route corridors contain a wide range of farming enterprises. Spanning from Peterhead to Boddam, the soil is predominantly Class 3.2 the land is used to grow vegetables and potatoes as well as cereals and oilseeds. There are areas where the land is capable of a more limited range of crops and the proportion of grass increases, stocked with cattle and sheep. The largest area of forestry is at Bruntbrea, situated near Stuartfield. Where the routes pass through woodland and commercial forestry, the routes would be repositioned to avoid the need to fell any woodland.

### 11.3.4 Potential Effects on Soils, Agriculture and Land Use

35. Taking account of the findings of the work undertaken to date, whilst still adopting a precautionary approach at this preliminary stage, potential effects associated with the construction and/or operation of the onshore works include:

- Direct loss of agricultural land, by agricultural land classification;
- Direct loss of woodland, by type and activity
- Indirect effects on soil quality including changes in land capability (for agriculture or forestry);
- Environmental effects such as diffuse pollution from mobilisation of soils and changes in agricultural/land drainage and/or effects on agri-environmental schemes;
- Changes in agricultural and woodland activity;
- Changes in sporting uses and viability; and
- Changes in access

### 11.3.5 Potential Mitigation and Monitoring

36. There will be a commitment to implementing accepted good practices during construction, operation and maintenance of the onshore works thereby ensuring that many potential effects on soils, agriculture and land use can be avoided or reduced. Generic mitigation and also site-specific measures will be identified including;

- A soil protection strategy (topsoil and subsoil); Land drainage management;
- Avoidance of transmission of soil pests and diseases;
- Maintenance of water supplies; and
- Temporary and permanent access/accommodation works.

37. Reference will also be made to the mitigation measures in relation to pollution prevention and soil erosion provided in Chapter 9.

### 11.3.6 Consultation

38. The consultees below will be approached for information to inform the EIA. Aberdeenshire Council may also contact a number of these consultees regarding the scope of the EIA:

- The National Farmers Union Scotland;
- The Scottish Rural Property and Business Association (SRPBA);
- Forestry Commission Scotland and Forest Enterprise Scotland; and
- Commercial agricultural and forestry enterprises identified.

### 11.3.7 Conclusion

39. No significant adverse effects are anticipated from the Proposed Development on the type or quality of agricultural land. A range of mitigation measures are available that can further address potential impacts on scarce land resources. As such it is considered appropriate for Agriculture to be scoped out of any EIA

### 11.3.8 Key Questions for Council and Consultees

- Q11/1: Are the scopes of the assessments appropriate?
- Q11/2: Are there any additional consultees, other than those mentioned above, who should be contacted to inform the assessment?

# Appendix A – Figures

# Appendix B – Ecology Desktop Appraisal

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GREEN VOLT

# Appendix 1.2

## Initial Scoping Opinion

Onshore EIA Report: Volume 3

Our Ref: ENQ/2022/0373
Your Ref:

Ask for: Elizabeth Tully
Tel: 01467 533417
Email: elizabeth.tully@aberdeenshire.gov.uk

Greencat Renewables
Stobo House
Roslin
EH25 9RE

11/05/2022

Dear Sir/Madam

**The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017**
**EIA Screening/Scoping Opinion for Erection of 300MW Floating Windfarm - Onshore Infrastructure at Green Volt Offshore Windfarm, Ettrick/Blackbird Oil And Gas Fields Grid Reference: 397529.845877**

I refer to your requests for an EIA screening and scoping opinion for onshore infrastructure associated with the proposed Greenvolt project, received on 14 March 2022. Each request is discussed separately below. Please note, that both the EIA Screening Opinion and Scoping Opinion relate solely to the onshore infrastructure only. It is acknowledged that a separate scoping report was considered by Marine Scotland (MS) for the offshore infrastructure and that response was provided by MS on 19 April 2022).

Screening Opinion

A request for a screening opinion is made under Regulation 8 of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

The Planning Authority is required to provide and record a formal screening opinion based upon an assessment of the location, nature, purpose and possible effects of the development. Under the terms of the above Regulations, the proposed development is not of a type expressly listed under either Schedule 1 or Schedule 2. However, the EIA Directive has a “wide scope and broad purpose” and because a development is not specifically mentioned does not mean it falls outside of the scope of the Regulations – it is important to consider the scope and purpose of a project, not just its label. As such, the Council has taken the decision to Screen the development under Class 3 (Energy Industry) given its connection to the energy industry through transmitting electricity harnessed by wind turbines. An Environmental Impact Assessment (EIA) will only require to be submitted as part of the planning application if the Planning Authority considers that the type of proposal in this particular location is likely to give rise to significant environmental effects. The following 3 issues require to be considered:

1. Characteristics of Development
2. Location of Development
3. Characteristics of the Potential Impact

The proposed development includes excavation works over the 28km (approximate) cable route from the Buchan Coast, inland to south-west of New Deer; a new substation to be located in close proximity to an existing substation; Horizontal Directional Drilling (HDD) along the route and at the chosen landfall location; construction and welfare compounds; working areas alongside cable trench. The nature of the development is largely industrial, however the only permanent industrial feature would be the operational substation. The construction works through the cable corridor and at the landfall point would be temporary, with the completed works being under reinstated/restored ground.

The development can effectively be split into three sections:

- Landing point
- Cable corridor
- Substation

The joining points are perhaps the most sensitive areas of the development. The northern joining points adjacent to Scotstown Beach, St Fergus, are not covered by the Rattray Head to Peterhead Local Nature Conservation Site (LNCS) (LNCS 78) but is included within the 500m buffer and have potential to impact upon its qualities. The southern joining points, sited between Peterhead and Boddam are again located within or adjacent to the Skelmuirhill, Stirling Hill and Dudwick LNCS (LNCS 89). In addition to LNCS 89, there are coastal designation that may well be affected by the HDD works to connect offshore and onshore infrastructure. The Buchan Ness to Collieston Coast SPA, Bullers of Buchan Coast SSSI, Buchan Ness to Collieston SAC are all designated around the Boddam area.

The chosen cable corridor would pass through the Buchan area, into the Formartine area, terminating south-west of New Deer. Cable routes from the south (options 1 and 3) would pass through LNCS 89 and cable routes from the north would pass in close vicinity to Scheduled Monuments in Inverugie. All cable routes indicated would have the potential to affect the built and natural environment. It is noted that efforts are made to avoid woodland, peatland and settlements where possible.

The substation locations indicated are not within any designated areas but are adjacent to an existing substation.

Impacts from the proposed development are likely to be most prominent during the construction phase, with open trenching, compound areas for storage and HDD works and welfare facilities being created. Impacts are likely to affect local residents close to the cable corridor, landfall point and substation location. While the impacts, including visual and amenity impacts, would be ‘rolling’ as construction moves along the corridor and be restored after work has finished, they are likely to be intense and somewhat intrusive to dwellinghouses. The substation would have construction and operational impacts, given the visual change through the construction of the structure.

Based on this assessment it is our opinion that an **Environmental Impact Assessment Report is required.** While the proposed development is likely to have significant effects

on the environment, these are likely to be limited to focussed topics. The Scoping Opinion which follows below will provide detail of the scope of the EIA Report (EIAR) required to accompany any planning application.

Scoping Opinion

I am now in receipt of all the necessary consultation responses and I can now offer a formal Scoping Opinion under Regulation 17 of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the Regulations).

Schedule 4 of the Regulations states the information which should be included in an Environmental Impact Assessment Report (EIAR). These guidelines offer the backbone to the structure of an EIA Report and should be used as the basis for your submission.

In order to make an assessment of the above information there are specific criteria and guidance set out in Schedule 4 of the Regulations. In particular these include characteristics of the development, an outline of any alternative options/sites and the main reasons for the options/sites chosen. Environmental issues are of obvious key importance such as those aspects of the environment that would be likely to be significantly affected. Detailed survey work would be required to inform the EIA Report. Following analysis of the aspects of the environment which would be likely to be significantly affected, a detailed assessment of the effects themselves would be required along with mitigation measures proposed.

Examples of the types of issues that should be addressed include:

- Climate change
- Local Economic Effect
- Landscape Resource
- Soils and geology
- Visual Amenity
- Ornithology
- Visual Amenity
- Ecology
- Nature Conservation
- European Protected Species
- Hydrology and Water Supplies
- Forestry and Tree Felling
- Transport and Traffic including road safety issues and impact on local road network during and after construction work
- Noise
- Cultural Heritage and archaeology
- Land Use
- Land Ownership
- Tourism and Recreation, including footpaths
- Proposed mitigation measures

Please note that the above list is by no means exhaustive and that other issues might become obvious following public consultations and consultations with statutory consultees.

Comments on specific chapters, including those made from internal and external consultees, are below.

**Planning Policy**

You will be aware that the proposed Aberdeenshire LDP is at examination at present. The Reporter's report is expected to be returned to the Council during the month of May. The new LDP is anticipated to be adopted in August 2022, however this is subject to change. You are encouraged to keep up-to-date with the status of the proposed LDP prior to submission of any application.

It is noted that it is the intention to 'reference' NPF3, NPF4 and SPP. It is unclear what 'referencing' entails, so it is recommended that the key paragraphs and a brief discussion of these be covered within the Planning Policy section of the EIAR.

**Landscape and Visual Impact**

The proposed 1km study area from the centre of the cable route is accepted.

The methodology proposed to assess the landscape impacts appear acceptable.

Visualisations showing the baseline and built development should be included within the EIA Report. The construction compound for the jointing bay should also be included within the visualisations and include any landscaping or mitigation. The visualisations should be based on a ZTV which the Council would be happy to consider and assist with viewpoint selection.

Visual impact should be considered by a range of receptors where possible and include various landscape character types and landscape designations as appropriate.

**Ecology**

The contents of Section 6 of the scoping report are noted. Comments within this section of the scoping opinion relate to protected species and protected sites.

There are three protected areas south of Peterhead:

- Buchan Ness to Collieston Coast Special Area of Conservation (SAC)
- Buchan Ness to Collieston Special Protection Area (SPA)
- Bullers of Buchan Coast Site of Special Scientific Interest (SSSI)

The southernmost option for cable landfall lies outwith, but directly adjacent to the above protected areas. The EIA report shall assess any impacts the onshore works will have on the interests of the above protected areas.

The Loch of Strathbeg SSSI and SPA lies approximately 5km north of the northern option for cable landfall. NatureScot advises that, should this option be chosen, the EIA should take account of the potential for the cable landfall becoming re-exposed as a result of landward retreat of the beach, which is predicted for parts of the bay. While a cable may be reburied, it may create a demand for protective measures, which could interrupt coastal

sediment transport which in turn could affect the SSSI's nationally important geomorphology and dependant habitats. Re-exposure of a trenched landfall should be scoped in as a potential effect.

There are several Local Nature Conservation Sites (LNCS) in the coastal region that do not appear to have been addressed within the scoping report. LNCS 89: Skelmuir Hill, Stirling Hill and Dudwick is located in the south and would be directly impacted by corridor options 1 and 3. LNCS 78: Rattray Head to Peterhead is an offshore designation but does cover the coastal area. The jointing point option areas associated with corridor options 2 and 4 would either lie within the LNCS area or within its 500m buffer area and has the potential to directly impact on the designation. Details of the designations can be found in the Aberdeenshire Local Development Plan 2017 as Supplementary Guidance 5b (maps 17-19 for LNCS 78) and Supplementary Guidance 5d (maps 39a-d for LNCS 89). It is also noted that cable route 2 is within the 500m buffer for LNCS 84: Rora Moss (map 107). Engagement with Aberdeenshire Council is advised to discuss these aspects.

Environment and Infrastructure Services (Environment – Natural Heritage) accepts the range of ecological (non-avian) surveys proposed to be scoped into the EIAR is appropriate. No additional surveys are advised to be undertaken at this stage, however it is reminded that additional surveys and studies may become apparent at a later stage. NatureScot agree the proposed surveys, methodologies and mitigation are appropriate at this stage and recommend the development delivers net biodiversity gains through biodiversity enhancement across all aspects – not just limited to ornithological interests.

It is advised that the proposed CEMP should include Species Protection Plans unless these are to comprise a separate standalone document.

**Ornithology**

NatureScot generally agree with the species, methodologies and embedded mitigation, however it is not agreed that breeding seabirds are scoped out of the assessment. The EIAR shall include a full assessment of the bird species listed as a qualifying interest within the Buchan Ness to Collieston SPA and Bullers of Buchan Coast SSSI. It is also advised by NatureScot that disturbance to seabirds using the waters of the marine section of the Buchan Ness to Collieston SPA should be considered within the EIA Report.

NatureScot acknowledges the approach to outline principles for biodiversity enhancement with regard to ornithological interests.

Environment and Infrastructure Services (Environment – Natural Heritage) have no comments to make in addition to those made by NatureScot.

It is noted within 7.7.4 that sensitive ornithological information will form a confidential appendix to the EIAR and will be provided to NatureScot. Aberdeenshire Council would also request sight of this appendix and confirm the contents will not be shared publicly.

**Cultural Heritage**

It is noted that the methodology appears to be entirely desk based at this stage. Please be advised that it is likely a level of Walkover Survey will be required with the submission of an application for planning permission.

Section 8.2 of the scoping report includes various policies and legislation. I am unsure of the documents referenced as *Planning Policy Advice: Historic Environment* and *Supplementary Guidance: Historic Built Environment.* I would be grateful if you could clarify what these documents are and where they can be found.

The proposed study areas for indirect visual impacts are noted as 2km for B Listed Buildings and 5km for A Listed Buildings, Scheduled Monuments, Gardens and Designed Landscapes, Inventory Battlefields and World Heritage Sites. It is noted that in table 8.1 Category C Listed Buildings are assessed as having a medium sensitivity, but C Listed Buildings appear to be scoped out. It is requested that effects upon C Listed Buildings should be considered within a 2km radius alongside B Listed Buildings.

Environment and Infrastructure Services (Archaeology) considers the assessment criteria outlined in tables 8.1 and 8.2 to be acceptable. It is noted in the response that the baseline assessment at Section 8.4 only uses data from the NRHE database. The data is in point format only and not polygonised, and therefore does not represent the full extent of known archaeological assets. It is also not a full record of undesignated archaeology sites and the data is not fully up to date. The statements within Table 8.3 of the Scoping Report about the presence or absence of known archaeological assets with the various routes are considered incorrect. It is advised that, for the purposes of a cultural heritage assessment, data on designated archaeological sites be obtained direct from Historic Environment Scotland (HES) while data on undesignated archaeological sites should be obtained direct from the local authority's Historic Environment Record.

It is advised that engagement directly with our Archaeologist is entered to assist with a full identification and assessment of cultural heritage assets in the vicinity of the development.

Please note that at the time of writing, comments from HES are awaited. In order to provide the bulk of the scoping response to you timeously, HES comments will follow as an addendum.

**Geology, Hydrology, Hydrogeology and Soils**

The study area of 1km around infrastructure locations and cable corridor is appropriate to consider potential impacts. SEPA agrees with the proposed methodology as set out in section 9 of the scoping report.

It is noted that Contaminated Land is not covered in the scoping report. The proposed cable corridors are located within 1km of former radar stations or former airfields active during WWII and there may be a presence of radium 226. The proposed cable routes pass through 17 (total) areas of potentially contaminated land, including a landfill, however there may be other areas of unrecorded potential contamination. Development within contaminated areas may create a pathway for contamination to move, contamination may also create a barrier to development. Given the potential direct impacts, contaminated land

should be scoped into the EIAR, including any necessary mitigation to be included within an Environmental Management Plan (EMP). Contact with Aberdeenshire Council should be made to discuss any assessments to be undertaken prior to the submission of an application however a Phase 1 desk study is advised in the first instance, which may need a Phase 2 investigation thereafter. Please contact the Council to discuss contaminated land matters.

In relation to watercourses, coastal waterbodies, private water supplies (PWS) and groundwater dependant terrestrial ecosystems (GWDTE), the use of Horizontal Directional Drilling (HDD) is welcomed for the landing point and as mitigation for construction works through sensitive habitats and watercourses. It's noted that flood risk is not included within section 9. Based on the information submitted, a detailed Flood Risk Assessment is likely not required if any watercourse crossings (including temporary crossings) are designed to accommodate the 1 in 200-year flood event and infrastructure is located at least 15m from the bank top of the watercourse. Once a cable route is refined the Council (in consultation with SEPA) would be happy to confirm requirements. Environment and Infrastructure Services (Flood Risk and Coastal Protection) confirm a Drainage Impact Assessment (DIA) will be required within an EIA Report.

The scoping in of PWS is welcomed. Appendix 5 of the SEPA consultation response details further information that should be provided to support a planning application. Avoidance of PWS should be the first principle, otherwise HDD may be a suitable mitigation tactic.

The proposed targeted NVC survey is appropriate to consider impacts upon GWDTE. As above, avoidance should be the first principle, but HDD or floating tracks may also be suitable mitigation.

It is noted that all proposed cable routes are likely to pass through areas of peat and could therefore have a potentially negative impact. A Peat Management Plan (PMP), including mitigation measures, should be included within the EIAR.

The EIAR should be accompanied by a draft Construction Method Statement (CMS) including an EMP, Water Management Plan (WMP) and Surface Water Management Plan (SWMP). A PMP; Private Water Supply Risk Assessment (PWSRA) and decommissioning plan should also be contained as an appendix to the EMP.

**Air Quality**

Environment and Infrastructure Services (Environmental Health) agrees that air quality impact assessments are not required for construction traffic or operational impacts and the methodology for construction dust impacts as outlined within the scoping report is appropriate. Pre-application advice is available for the EHO to consider detailed assessment proposals prior to carrying out the assessment.

**Other Considerations**

Public Rights of Way/Core Path Assessment

The impact of the proposed development on public access should not be scoped out of the assessment given the popularity of coastal routes and the Formartine and Buchan way for public access. Impacts cannot be dismissed as the scoping report acknowledges there will be an impact on core paths and rights of way.

It should be confirmed within the EIAR the method of cable laying to be used at the various crossing sites – HDD or open trenching?

Engagement with the Council to discuss impacts and mitigation is encouraged.

Traffic and Transport

The contents of Section 11.2 of the scoping report are noted. The study area identified appears acceptable at this stage. The method of construction/cable laying is not identified within the scoping report and should be addressed within the EIAR (i.e. HDD/open trenching) as this will affect the potential impacts and mitigation required.

Environment and Infrastructure Services (Roads Development and Transportation) are generally satisfied with the proposals contained within the scoping report, however it is suggested that the EIAR include all details of new or temporary junctions formed on the public road network (i.e. haul roads, storage compounds etc). These must meet the local authority standards in terms of visibility. Engagement with the local authority is advised to discuss proposals.

Transport Scotland (TS) acknowledges that the development will require to cross the A90 Trunk Road for any of the potential routes under consideration. TS makes no comment on the scoping report, but does outline that any proposed changes to the trunk road network (including any changes to its operation) must be discussed and approved. It is advised early engagement is taken with TS to discuss proposals, potential impacts and likely mitigation measures.

Agricultural Land

The baseline set out in section 11 of the scoping report seems accurate, identifying land within the cable corridors include ‘Prime Agricultural Land’ (PAL) and areas of forestry, also identifying potential effects including direct loss of agricultural land and woodland, along with indirect effects upon soil quality as a result of the proposed development. It is noted that it is proposed to scope agriculture out of an EIAR assessment. Aberdeenshire Council does not agree with this suggestion. Direct and indirect effects have been identified which should be considered fully within the EIAR, along with any mitigation required to reduce/remove these effects.

Although woodland would be directly lost from the proposed development, the avoidance of ancient woodland is welcomed. There is, however, no consideration of compensatory planting as mitigation within the scoping report. This should be considered and identified within the EIAR, as should any mitigation required to reduce impacts upon PAL. Tree

protection proposals are also required, particularly where works are in close proximity to woodland included in the NatureScot Ancient Woodland Inventory.

Other issues:

It appears noise impacts have been omitted from the scoping report. It is likely that there may be some impact on neighbours to the substation during the construction and operational phases, along with properties in close proximity to the chosen cable route during the construction phase. Information should be provided regarding the scoping out, or otherwise, of noise. Until such a time the information has been submitted and confirmation given that noise can be scoped out, the issue must be included within the EIAR. A Noise Impact Assessment (NIA) including noise levels and any proposed mitigation should be included, with an indicative programme of works (including construction period, how development is to move along the cable corridor and construction times) also advised. Advice can be sought on the issue.

Decommissioning should be considered as a separate chapter of the EIAR.

A schedule of mitigation should be included within the EIAR.

I hope the above information is of assistance as a formal scoping opinion in respect of the relevant EIAR. Continued engagement with the Council is encouraged to discuss progress or any issues encountered. The advice given is based upon the information included within the scoping report. Obviously during the processing of any associated planning application other issues may become obvious following public consultation and consultations with statutory consultees.

All consultation responses have been fed into this response, however these will be forwarded under separate cover for your information. Your attention is drawn to them as they contain additional technical guidance (particularly SEPA).

This opinion will be held for public inspection for a two year period, or until a planning application is submitted at which time the opinion will be transferred to the planning register with the application.

Yours faithfully

Paul Macari
Head of Planning and Economy

GREEN VOLT

# Appendix 1.3

## Updated Scoping Report

Onshore EIA Report: Volume 3

# Green Volt Offshore Windfarm – Onshore Infrastructure

EIA Scoping Report

**Client:** Green Volt Offshore Wind Ltd
**Reference:** C4342-1234
Version 2.0

December 2022

FLOTATION ENERGY

**Report Prepared for:**
Green Volt Offshore Wind Ltd

**Author:**
Green Cat Renewables Ltd

GLM Ecology

| | | | |
|---|---|---|---|
| **Checked by** | Rob Collin | Date | 28/02/2022 |
| **Approved by** | Cameron Sutherland | Date | 28/02/2022 |

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| V1.0 | 28/02/2022 | Final for submission |
| V1.4 | 02/12/2022 | Update to Scoping - Client draft |
| V2.0 | 23/12/2022 | Updated Scoping Report for submission |

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# Preface

This Scoping Report is an update to the Scoping Report submitted to Aberdeenshire Council in February 2022. A scoping opinion was received from Aberdeenshire Council on 11 May 2022 (ENQ/2022/0373). The May 2022 scoping report looked at several different landing points, four potential cable route corridors and four potential substation location. Since that time much work has been done to develop the landing point locations, substation and potential cable route. As a result, the development has changed since the original scoping. At the advice of Aberdeenshire Council, the Applicant has agreed to re-scope the development. Therefore, this Scoping Report has been prepared in order to support a request for a formal Scoping Opinion in relation to the onshore elements of the proposed Green Volt Offshore Windfarm from Aberdeenshire Council and Consultees. The Applicant, Green Volt Offshore Wind Ltd (Green Volt), intends to submit separate consents, licences and permissions for the offshore (below Mean High Water Springs (MHWS)) and onshore (above Mean Low Water Springs (MLWS)) infrastructure of the project. A separate offshore scoping report was prepared and submitted to Marine Scotland[1] on 2 December 2021 and a scoping opinion received on 20 April 2022[2].

Green Volt Offshore Windfarm is being proposed as the first major step towards the goals of the UK North Sea Transition Deal, a sector deal between the oil and gas industry and UK government, signed in March 2021. This Deal recognises that oil and gas will continue to play an essential role in our energy supply as part of the transition towards Net Zero and that it is, therefore critical, to reduce the CO2 emissions generated by offshore oil and gas production from the earliest possible time point, with a minimum reduction of 50% by 2030.

To be operational by 2026, Green Volt offers the opportunity to mitigate 500,000 tonnes of CO2 per year and fully electrify Buzzard, one of the UK's largest oil and gas assets. The opportunity is being evaluated in partnership with CNOOC Petroleum Europe Ltd (CPEL), the operator and largest shareholder in the Buzzard field and would enable removal of the offshore power station, which currently fuels oil and gas production from the field. With a dedicated grid connection, Green Volt Offshore Windfarm would also provide renewable energy to Scotland for decades to come and accelerate Scotland's path towards being a global leader in floating wind capability by creating the world's largest offshore floating windfarm. Green Volt is proposing the development of the Green Volt Offshore windfarm on a brownfield site previously hosting the Ettrick and Blackbird oil field, 75 km east of the Aberdeenshire coast. The development will supply power to the Buzzard oil field and the National Grid, making landfall near Peterhead.

This Scoping Report considers all onshore infrastructure required to facilitate the connection of the offshore elements of the windfarm, notably:

- Horizontal Directional Drilling (HDD) compound
- Cable Landing/Jointing Pit;
- Cable Route between Landing point and grid connection point at New Deer; and
- A new substation at New Deer.

[1] Royal HaskoningDHV (2021). Green Volt Offshore windfarm – Offshore Environmental Impact Assessment. Available at: https://marine.gov.scot/data/scoping-request-green-volt-floating-offshore-wind-farm-east-aberdeenshire-coast

[2] Marine Scotland (2021). Marine Scotland - Licensing Operations Team Scoping Opinion. Available at: https://marine.gov.scot/data/scoping-opinion-green-volt-offshore-wind-farm-east-aberdeenshire-coast

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# 1 Introduction

## 1.1 Overview

1. This submission consists of a request for a Scoping Opinion under Regulation 17 of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 and a request for a Screening Opinion under Regulation 8 of the same regulations.
2. The Scoping Request has been prepared by Green Cat Renewables (GCR) on behalf of Flotation Energy Ltd, hereafter referred to as 'the Applicant'. For the purposes of this Scoping Report, the Proposed Development would comprise the onshore infrastructure associated with the proposed Green Volt Offshore Wind Farm . The Green Volt Offshore Wind Farm aims to install a 300MW floating wind farm on the decommissioned Ettrick / Blackbird oil and gas fields in the North Sea by 2026. The Green Volt Offshore Wind Farm will provide renewable electricity to power the operations of the Buzzard oil field, one of the largest oil and gas developments on the UK continental shelf and provide surplus renewable electricity to the UK grid as part of the North Sea electrification programme outlined in the North Sea Transmission deal.
3. To facilitate the connection of the Green Volt Offshore Wind Farm to the national grid, a new buried export cable will be required to connect the development at the offshore / onshore interface to a new substation at New Deer, approximately 35km west of Peterhead (the 'Proposed Development').
4. Options for an appropriate landing point for the offshore cable and associated infrastructure are being investigated along with the cable route from each of the landing points back to a new substation at New Deer. These options form the basis for the Scoping Exercise.
5. The Proposed Development (underground cabling and associated works) does not explicitly fall within the requirements of the EIA regulations, and we welcome the opinion of Aberdeenshire Council and consultees.
6. A separate EIA scoping exercise was undertaken for the Green Volt Offshore Wind Farm elements of the project ('the offshore works'). Responsibility for that scoping exercise and the EIA for the offshore works lies with Marine Scotland LOT.
7. Figures accompanying this scoping report are presented in Appendix A.

## 1.2 The Applicant

8. Green Volt Offshore windfarm is being developed by Green Volt Offshore Windfarm Ltd (herein referred to as Green Volt), a new company formed by Flotation Energy Plc (FE). The project proposes to develop a floating offshore windfarm to facilitate a first of its kind decarbonisation of the Oil and Gas industry through the complete electrification of the Buzzard oil and gas field (operated by CPEL) with the support of a fully connected UK grid connection back to the New Deer substation in Aberdeenshire.
9. Flotation Energy is an offshore wind development company, headquartered in Edinburgh, UK. Founded in 2018, the company is pioneering the deployment of both floating and fixed offshore wind in the UK and Internationally. Flotation Energy's UK projects include:

- Green Volt Offshore Floating windfarm (this development)
- Morecambe Offshore Windfarm (480 MW offshore wind, awarded as part of the England and Wales Round 4 auction)
- White Cross floating windfarm (100 MW offshore wind, south-west England)

10. The company is also active in Europe and Internationally, with a total offshore wind development pipeline of over 10-Gigawatt (GW) capacity.

## 1.3 The Agent

11. GCR Green Cat Renewables Ltd has been commissioned to prepare this report. GCR is an environmental and engineering consultancy focused on all aspects of development support, based in Scotland. With a team of approximately 75 staff spread across three offices, the company's multi-disciplinary resource base spans all stages of project delivery from feasibility and concept development through to planning, engineering, project management and operational asset management. While much of the company's experience is within the renewable sector, GCR's emphasis is on supporting farmers, landowners and developers in a wide range of renewable projects. GCR have also developed expertise in helping a range of businesses find sustainable energy solutions to aid economic viability in a climate where energy costs are forecast to continue to rise.
12. The GCR EIA team brings a diverse skill set that includes planning, environmental and technical expertise, and is comprised of Project Managers, planners, consultants, environmentalists, engineers, acousticians, CAD technicians, GIS technicians, hydrologists and resource analysts.

## 1.4 Purpose of the Scoping Report

13. The purpose of this report is to obtain an updated scoping opinion from Aberdeenshire Council as a planning authority, and other stakeholders in accordance with the Town and Country Planning (Environmental Impact Assessment (Scotland) Regulations 2017. This Scoping Report provides an update to the February 2022 Scoping Report previously issued to Aberdeenshire Council given the changes to the Proposed Development. The previous Scoping Opinion (ENQ/2022/0373) issued by Aberdeenshire Council in May 2022 has been taken into consideration in this updated Scoping Report.
14. The Scoping Report has been prepared as the initial stage of the EIA process in support of a formal request for a scoping opinion from Aberdeenshire Council, under regulation 17 of the EIA Regulations.
15. As outlined in Regulation 17(2) this report includes:

- A description of the location of the development, including a plan sufficient to identify the land;
- A brief description of the nature and purpose of the development and of its likely significant effects on the environment; and
- Such other information or representations as the developer may wish to provide or make.

16. The EIA process must identify and assess, in an appropriate manner, in light of the circumstances relating to the Proposed Development, the direct and indirect significant effects of the Proposed Development on a number of factors and the interaction between these factors (Regulation 4(2) and (3)). These factors under the 2017 Regulations are:

- Population and human health;
- Biodiversity, and in particular species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
- Land, soil, water, air and climate;
- Material assets, cultural heritage and the landscape.
- The purpose of the scoping report is to:
- Identify the key areas to be considered as part of the EIA;
- Identify areas which can be scoped out of the EIA or which do not require to be addressed in greater detail; and

- Review activities which may give rise to potential significant environmental impacts during the lifecycle of the development.

17. This Scoping Report outlines the proposed approach to the assessment of environmental impacts and the proposed EIA Report content, for approval with Aberdeenshire Council and other Statutory Consultees.
18. The Applicant has appointed an EIA project team to provide the relevant assessment, advice, and reporting to support the delivery of the EIA. The appointed team have the necessary experience and qualifications to carry out the assessments.

## 1.5 Phasing of Information Provided

19. The Development Management Procedures[3] indicates that the information required for proposals to be assessed should be:

- Necessary to inform the decision;
- Relevant to the development proposal; and
- Proportionate to the scale and complexity of likely impacts arising and are clearly scoped to avoid unnecessary costs.

It also indicates that the information submitted should be:

- Focussed;
- Fit for purpose; and
- Clear in its findings.

20. The level of information provided will be commensurate with the stage of the development. A progression is anticipated between the high-level scoping stage, site specific details for the planning application stage and detailed technical stage for the discharge of conditions.
21. Given the scale of the Proposed Development, it is anticipated that a robust set of controlling conditions will be attached to any consent to ensure appropriate environmental protections. It is expected that a Construction Method Statement will be produced, containing an Environmental Management Plan, Water Management Plan, Access Management Plan, Landscape Mitigation Plan and a Surface Water Management Plan.

[3] The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013

# 2 Proposed Development

## 2.1 Introduction

1. To facilitate the connection of the offshore works to the national grid, a new buried cable will be required to connect the offshore works to a new substation at New Deer, approximately 25km west of Peterhead. The offshore works will be connected to the onshore work package via a joint bay (underground), where the offshore cables will be brought onshore and connected to the onshore works. A horizontal directional drilling (HDD) compound will also be included as part of the Proposed Development.
2. This connection will also facilitate the supply of power to offshore platforms during periods of down time or inactivity from the wind farm.
3. The proposed cable corridor for the purposes of scoping is 500m in width. The main high voltage underground cables will have capacity to transmit 300 megawatts ('MW') of electricity.
4. Two search areas for an appropriate landing point for the offshore cable and associated infrastructure are being investigated, along with a cable route corridor from each of the landing points to the substation at New Deer. Both of these options form the basis for the scoping exercise. Following the scoping phase a final point of connection and route will be selected for the final EIA submission.
5. Constraints mapping of the HDD compound, jointing bays, route options and substation location are shown in Figures 2.1a to 2.1d.

## 2.2 The Need for the Proposed Development

6. Green Volt Offshore Windfarm is being proposed as the first major step towards the goals of the UK North Sea Transition Deal, a sector deal between the oil and gas industry and UK government, signed in March 2021. This Deal recognises that oil and gas will continue to play an essential role in our energy supply as part of the transition towards Net Zero and that it is, therefore critical, to reduce the CO2 emissions generated by offshore oil and gas production from the earliest possible time point, with a minimum reduction of 50% by 2030.
7. To be operational by 2026, Green Volt offers the opportunity to mitigate 500,000 tonnes of CO2 per year and fully electrify Buzzard, one of the UK's largest oil and gas assets. The opportunity is being evaluated in partnership with CNOOC Petroleum Europe Ltd (CPEL), the operator and largest shareholder in the Buzzard field and would enable removal of the offshore power station, which currently fuels oil and gas production from the field. With a dedicated grid connection, Green Volt Offshore Windfarm would also provide renewable energy to Scotland for decades to come and accelerate Scotland's path towards being a global leader in floating wind capability by creating the world's largest offshore floating windfarm. Green Volt is proposing the development of the Green Volt Offshore windfarm on a brownfield site previously hosting the Ettrick and Blackbird oil field, 75 km east of the Aberdeenshire coast. One export cable would supply the Buzzard oil field 15 km away, whilst a second export cable would supply the National Grid, via the onshore connection to New Deer.
8. The Proposed Development is supported by a framework of international, UK and Scottish climate change and renewable energy policies. These policies are material considerations which will be reviewed in the EIA report.
9. The Proposed Development supports the recently published Crown Estate Scotland leasing process for offshore wind farms to help decarbonise Scotland's oil and gas sector (Innovation and Targeted Oil and Gas Decarbonisation– INTOG leasing round) and the associated INTOG sectoral marine plan that is currently in the

public consultation phase which is being managed by Marine Scotland and the Scottish Government[4]. This aims to provide the mechanism to support the North Sea Transition Deal[5] and the decarbonisation of oil and gas installations in the North Sea by 50% by 2030.

10. National Planning Framework 3 (NPF3) (2014) is a strategy setting out plans for development and investment in infrastructure by the Scottish Government over the next 25 years. It is supported by Scottish Planning Policy (SPP) which includes policies on renewable energy and acknowledges Scotland's offshore renewable energy resources. NPF3 acknowledges the deployment of offshore renewables will become increasingly important in Aberdeen and the north-east and that there is a desire for Scotland to become a world leader in offshore renewable energy. There is recognition that focusing on enhancing the high voltage transmission network supports this and will help to facilitate offshore renewable energy developments.
11. The Climate Change (Emissions Reduction Target) (Scotland) Act 2019 provides targets for a reduction in greenhouse gas emissions. It includes the net-zero emissions target year of 2045.
12. The Scottish Energy Strategy: The Future of Energy in Scotland (Scottish Government, 2017) sets out the Scottish Government 2050 vision for energy in Scotland. One of the visions includes renewable solutions, specifically championing Scotland's renewable energy resources and their ability to support energy targets.
13. The Scottish Government published a Climate Change Plan (CCP) in February 2018 which set out how Scotland could deliver a climate change target of emissions reductions (66% relative to baseline for 2018-2032). With regards to electricity, the CPP notes that; *"By 2032, Scotland's electricity system will supply a growing share of Scotland's energy needs and by 2030, 50% of all Scotland's energy needs will come from renewables"*.
14. The Scottish Government, along with many others across the world, declared a climate emergency in 2019, outlining the need for swift and decisive action to limit the warming of the planet by 1.5 degrees compared to 1990 levels.

## 2.3 The Required Onshore Infrastructure

15. Two option search areas were identified to investigate suitability for an appropriate landing point for the offshore cable and associated infrastructure. The Northern Landing Point and the Southern Landing Point as shown in **Figure 2.2a, 2.2b** and **2.2d.** As well as the landing point for the cable, two cable route corridors to facilitate the cable connection from the two proposed landing points back to the proposed substation location at New Deer are also considered as part of the scoping exercise. The proposed substation location is shown in **Figure 2.2c**. The two cable route corridors (Northern Route and Southern Route), the landing point and the proposed substation location form the basis for the Scoping Exercise.
16. The Proposed Development consists of electrical cables and a new substation to be installed as well as a small number of temporary work elements required as part of the installation process. The elements of the Proposed Development are as follows:

- HDD compound
- Joint bays (underground);
- Electrical cables installed in a single trench;
- Temporary working area alongside trench;
- Temporary storage and welfare compounds that move along the cable route;

[4] Marine Scotland Sectoral plan for offshore wind INTOG - https://marine.gov.scot/data/sectoral-marine-plan-offshore-wind-innovation-and-targeted-oil-and-gas-decarbonisation-intog

[5] North Sea Transition Deal – BEIS https://www.gov.uk/government/publications/north-sea-transition-deal

- Temporary compounds associated with Horizontal Directional Drilling (HDD) that move along the route; and
- A new substation with temporary storage and welfare compound.

17. The HDD compound will be located within the landing area. The compound will be approximately 175m by 50m.
18. The proposed substation location will comprise of Gas Insulated Switchgear (GIS) substation on a site approximately 250m by 180m. The temporary construction compound for the proposed substation will be approximately 150m by 70m.
19. The cable will comprise 3 single core 33,000-volt cross-linked polyethylene (XLPE) cables, copper earth strip (50mm2 or greater. The cables will be buried for the entire length of the route in a trench excavated to 1.5m depth and approximately 3m in width, except where they are ducted under watercourses or roads.
20. At the end of each cable drum, a joint bay is required which allows each length of cable to be jointed to the next. The joint bay will be excavated 1.5m deep max, 2m by 2m in area.
21. An area extending 10m alongside the trench will be required as a temporary working area. On the opposite side a 4 m area for temporary storage of spoil materials prior to reinstatement will also be required.
22. During the installation phase of the project there will be two temporary compounds housing a skip container (approx. 2m x 3m), a welfare unit (approx. 6m x 3m) and the cable drums (approx. 2m in diameter and 1.5m in width). There will be approximately 20 drums stored at any one time. It is not anticipated that hardstanding is required to provide a suitable and level working platform. Following completion of the cable route the facilities will be removed and the area returned to its original use.
23. Additional smaller temporary compounds will be required at the locations where HDD activities are proposed to take place.

## 2.4 Grid Connection Process

24. The Proposed Development is required to connect the offshore works to the national electricity grid, for the export of electricity generated as well as providing import power from the national electricity network to the operations of the Buzzard oil field. The electrical grid connection does not form part of the planning application for the Proposed Development.
25. A new Bilateral Connection Agreement (BCA) to provide 300MW Export and 60MW Demand. The onshore connection point will be New Deer 400kV Substation. The offer for connection to, and for use of the National Electricity Transmission System at Green Volt offshore substation (formerly Whirlwind) is made based on the Connect and Manage Arrangements, and on the basis of the Offshore Transmission System Development User Works (OTSDUW) Arrangements.

## 2.5 Landing Points

26. The interface point for the offshore/onshore cabling is required to be sited in close proximity to the coastline, this is to allow for to cable ducting to be sited in an appropriate depth of water to allow the installation team to carry out works safely. Two locations were identified by the offshore team as suitable to take forward

### 2.5.1 North Landing Point

27. An option area has been identified to the north of Peterhead, located on the eastern side of the A90, between the main road and the coastline. This option is shown on **Figure 2.1c.**

### 2.5.2 South Landing Point

28. Figure 2.1d shows the landing point option south of Peterhead. This also includes the potential to tie in with the North Connect cable landing point. Early discussions have been held regarding the use of this area.

## 2.6 Cable Corridors

29. Once the cable is landed and connected onshore, it is required to connect with the national electricity network. The location of the connection specified by SSE Transmission (SHET) is at the New Deer Substation shown on Figures 2.1.c and 2.2c.

30. A preliminary options appraisal process was undertaken to identify preferred site and cable route corridors for the landing point for the subsea cables on the coastline, the underground cable connection from the landfall to the proposed substation site and the proposed substation site.

31. Since the initial scoping, further appraisal has been undertaken following from a walkover and an assessment of key environmental constraints such as terrain, water features, woodland and cultural heritage assets. As a result of this appraisal, two preferred route options corridors were identified from the two landing point locations to the proposed substation location.

32. The detailed site and routeing appraisal considering environmental constraints, technical and economic feasibility, and deliverability will continue throughout the EIA process.

33. Figure 2.2a provides a high-level overview of the proposed locations for the landing points, cable routes and substation. These elements comprise the scoping boundary for the purpose of this report.

## 2.7 Construction Phase

### 2.7.1 Construction Environmental Management Plan

34. A draft Construction Environmental Management Plan (CEMP) will accompany the planning application. The CEMP sets out the general approach of environmental management and mitigation of impacts associated with the construction works. The appointed Construction Contractor will update and finalise the CEMP and will be responsible for ensuring that any adverse effects from the construction phase are minimised.

### 2.7.2 Cables

35. Cable installation will be undertaken via the excavation of a trench to facilitate the installation of the cables. The cables will be surrounded by stabilised backfill material and protected with warning tape above them. Excavated soil material will be used to back-fill the excavation, with the excess material spread in the immediate proximity to the excavation or removed from site.

36. The cable installation works will likely take place within a 50m wide excavation corridor accommodating working area, excavated soils and the cable trenches. The cables will be installed using methodology suited to the existing land use although it is anticipated at this stage that open cut trenching will be used for the majority of the cable length and horizontal directional drilling as an alternative to cross significant constraints such as watercourses and roads.

### 2.7.3 Jointing Bay

37. The marine cables will be connected to the land cables in a jointing bay buried in the ground. This location will be a temporary construction compound and will likely require topsoil stripping and shallow excavation. HDD cable ducts will be installed, and the HDD will drill seaward, installing the ducts for cables. The cables will be pulled inland from a marine vessel which will be located offshore as close to land as possible. The final size of the jointing bay will be approximately 10m by 10m.

38. Once the cables are installed, the ground will be reinstated and there will be no above ground infrastructure left in position. A temporary haul road will likely be required.

### 2.7.4 Substation

39. The proposed substation will be located in agricultural land approximately 6km south-east of New Deer on land nearby to the New Deer Substation which, at the time of reporting, is now operational.

40. The proposed substation will be a Gas Insulated Switchgear (GIS) substation. The site will be approximately 250m by 180m and will connect into the existing adjacent 400kV overhead lines. A temporary construction compound will be required adjacent to the proposed substation location. A construction compound of approximately 150m by 70m is proposed. Existing overhead lines and underground cables will require some amendments to connect them into the new substation.

## 2.8 Operational Phase

41. Following completion of the works, the substation will be unmanned and will be visited intermittently for monitoring and maintenance. Maintenance works will be required during the lifetime of the substation. The underground cables will be routinely assessed to ensure safety clearances are maintained.

## 2.9 Decommissioning Phase

42. The lifespan of a substation is approximately 50 years although there is the potential for to extend this with maintenance. Once expired, the materials would be recycled and it is anticipated that foundations would be removed and shallow soils reinstated.

43. It is assumed that the substation will be removed approximately 50 years. Similarly, underground cables have a life expectancy of approximately 50 years at which point they would remain buried in the ground. For assessment purposes, the EIA will assume that the cables would remain in situ at the end of their life.

# 3 EIA Methodology

## 3.1 Introduction

1. EIA is a statutory process governed by UK and European law. It is a means of drawing together in a systematic way an assessment of the likely significant environmental effects arising from a Proposed Development. In Scotland, the relevant regulations are provided in The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.
2. This section presents an overview of the methodology to be utilised for the production of the EIA. It outlines the methodology for the identification and evaluation of potential likely significant environmental effects and presents the methodology for the identification and evaluation of potential cumulative and any inter-related impacts.
3. To ensure that the information is presented in a structured and consistent way in each topic, the assessments will be presented broadly as outlined below:

- Introduction: Identifies key objectives and issues;
- Guidance: Summarises the relevant policy and guidance documents used to inform the assessment;
- Methodology: Summarises the methods used in undertaking the assessment work;
- Baseline: Summarises the existing situation;
- Assessment of Predicted Impacts and Effects: Identifies and assesses the predicted effects (both positive and negative) associated with the construction, operation and decommissioning of the Development;
- Mitigation: Summarises measures envisaged to avoid, reduce or remedy predicted negative effects of the Development;
- Summary of Predicted Impacts and Effects: Summarises impacts and effects predicted and proposed mitigation measures
- Conclusion: Summarises the conclusions of the assessment

## 3.2 Assessment Methodology

4. The individual methodologies for assessing each EIA topic area will be described in more detail in each of the individual chapters of the EIA Report. The following sections briefly outline the overarching assessment methodology to be undertaken.

### 3.2.1 Identification of Environmental Baseline

5. A review of the current environmental conditions will be undertaken to determine the appropriate baseline for assessment. In the majority of assessments this will involve the following:

- Definition of an appropriate study area, based on guidance and best practice;
- A review of currently available information relating to the development study area;
- Identification of likely or potential impacts;
- Outline further data/survey/monitoring required to obtain relevant information if required to support assessment;
- Review information to ensure sufficient data is available to provide a robust assessment.

### 3.2.2 Assessment of Impacts

6. The Applicant has appointed a competent team of EIA specialists who will undertake the required assessments using available data, new data (if required), professional and expert judgement.
7. The methods for predicting the nature and magnitude of any potential impacts vary dependent on the subject area. Quantitative methods of assessment can predict values that can be compared against published thresholds and indicative criteria in Government guidance and standards. Where it is not possible to use a quantitative method, a qualitative assessment method will be utilised, these assessments rely on the experience and professional judgement of the technical specialist.
8. The potential significant effects of development must be considered in relation to the characteristics of development and the location of development, with regard to the impact of the development on the factors specified in Regulation 3A (3), considering:

- The magnitude and special extent of the impact (for example geographical area and size of the population likely to be affected);
- The nature of the impact;
- The intensity and complexity of the impact;
- The probability of the impact;
- The expected onset, duration, frequency and reversibility of the impact;
- Cumulative impacts with the impact of other existing and/or approved development; and
- The possibility of effectively reducing the impact.

9. Table 3.1 illustrates how the criteria will be applied to ascertain the level of significance of a potential impact.

**Table 3.1 - Significance of effect matrix**

| Sensitivity | Magnitude of Change | | | |
|---|---|---|---|---|
| | High | Medium | Low | Negligible |
| **High** | Major | Major/Moderate | Moderate | Moderate/Minor |
| **Medium** | Major/Moderate | Moderate | Moderate/Minor | Minor |
| **Low** | Moderate | Moderate/Minor | Minor | Minor |
| **Key:** | | Significant in terms of the EIA Regulations | | |

## 3.3 Mitigation

10. The aim of the EIA is to avoid, reduce and offset any significant adverse environmental effects arising from the Proposed Development.
11. Where possible, reasonable steps will be taken during the design process to avoid the creation of significant or adverse impacts. Where these cannot be avoided completely, appropriate mitigation will be proposed to avoid or reduce the impacts to acceptable levels.

## 3.4 Conclusion and Residual Effects

12. The conclusion will summarise the key findings of the assessment and outline any residual effects which remain following the assessment and appropriate mitigation process and whether these are acceptable in EIA terms.

## 3.5 Structure and Content of the EIA Report

13. It is expected that the EIAR will be structured as below:

- Introduction & Background
- The Proposed Development
- Design Statement
- Planning Statement
- Landscape and Visual Impact Assessment
- Ecology
- Ornithology
- Archaeology and Cultural Heritage
- Hydrology and Hydrogeology
- Contaminated Land
- Noise
- Air Quality
- Other Issues
  - Public Rights of Way/Core Paths
  - Traffic and Transport
  - Agricultural Land
- Summary of Mitigation
  - Landscape & Visual Impact Assessment Figures
  - Planning Drawings & Technical Figures
  - Non-Technical Summary

# 4 Planning Policy

## 4.1 Introduction

1. The Proposed Development relates to the installation of an underground cable and ancillary infrastructure to connect the Green Volt Offshore Wind Farm with substation infrastructure at New Deer, Aberdeenshire to the cable landing location where the marine cable joins to the onshore cable. The forthcoming planning application will include a planning statement that appraises the Proposed Development against the Development Plan and other material planning considerations. Note: a separate offshore EIA will be submitted to Marine Scotland to cover all elements of the project up to mean high water spring (MHWS).
2. By the nature of the Proposed Development, being underground for the vast majority of the length of the cable, the potential for environmental impacts is most likely during the construction phase of the development – the underground sections of the Proposed Development will not generate emissions or additional traffic and will not be visible within the wider area. As such, while planning applications should be commensurate with the scale of the Proposed Development, they should also be commensurate with scale of potential environmental impacts. The planning application submission will be reflective of that balance.

## 4.2 The Statutory Development Plan and Non-Statutory Guidance

3. The planning policy context applicable to the site will be taken into account within the iterative design process. The site is wholly within the Aberdeenshire Council area and, therefore, the applicable Development Plan for the site comprises the Aberdeen City and Shire Structure Plan 2009 (ACSSP) and the Aberdeenshire Local Development Plan 2017 (LDP 2017). The Aberdeenshire Proposed Local Development Plan 2020 (LDP 2020) has been published but not yet adopted, however, it should be given material weight in the planning balance.

### 4.2.1 ACCSSP

4. The structure plan includes a vision that aims to develop the economy, maintain and improve the quality of the environment and provide a high quality of life up to 2030. The plan contains no policies but the forthcoming Planning Statement will contain an appraisal of the vision, spatial strategy and objectives of the plan and how they relate to the Proposed Development.
5. It is noted that the ACSSP highlights electricity grid reinforcement in the wider area of the Proposed Development. The Proposed Development would tie in with wider energy infrastructure development in the area.

### 4.2.2 LDP 2017

6. The site is wholly within the Buchan area as outlined in the plan. The key policies within the LDP 2017 that will be fully considered in the forthcoming Planning Statement include:

- Policy B1 Employment and business land
- Policy R1 Special rural areas
- Policy R2 Housing and employment development elsewhere in the countryside
- Policy P1 Layout, siting and design
- Policy P4 Hazardous and potentially polluting developments and contaminated land
- Policy E1 Natural heritage
- Policy E2 Landscape

- Policy HE1 Protecting historic buildings, sites, and monuments
- Policy HE2 Protecting historic and cultural areas
- Policy PR1 Protecting important resources
- Policy PR2 Protecting important development sites
- Policy C2 Renewable energy
- Policy C4 Flooding
- Policy RD1 Providing suitable services

#### 4.2.3 LDP 2020

7. The key policies within the LDP 2020 that will be fully considered in the forthcoming Planning Statement include:

- Policy R1 Special Rural Areas (Coastal Zone)
- Policy R2 Development Proposals Elsewhere in the Countryside (brownfield site route preference)
- Policy P1 Layout, Siting and Design
- Policy E1 Natural Heritage
- Policy E2 Landscape
- Policy E3 Forestry and Woodland
- Policy HE1 Protecting Listed Buildings, Scheduled Monuments and Archaeological Sites (including other historic buildings)
- Policy PR1 Protecting Important Resources
- Policy PR2 Reserving and Protecting Important Development Sites (route selection)
- Policy PR3 Reuse, Recycling and Waste (construction activities and decommissioning)
- Policy C2 Renewable Energy (associated infrastructure)
- Policy C3 Carbon Sinks and Stores
- Policy C4 Flooding
- Policy RD1 Providing Suitable Services (surface water and construction waste management)

8. All guidance documents are regarded as material considerations. A Planning Statement will be provided with the application which will contain an assessment of the accordance of the Proposed Development with the relevant policy and guidance documents as referred to above.

## 4.3 Other Material Considerations

9. Reference will be made to various national planning policy and guidance documents including:

- The National Planning Policy Framework 3 (NPF3);
- The Draft NPF4;
- Scottish Planning Policy (SPP); and
- Scottish Government web-based Renewables Guidance.

### 4.3.1 The Need for Renewable Energy and the Renewable Energy Framework

10. The clear objectives of the UK and Scottish Governments will be summarised, in relation to encouraging increased deployment and application of renewable energy technologies, consistent with sustainable development policy principles and national and international obligations on climate change.
11. On 27th June 2019, a new legally binding target to reach net zero greenhouse gas emissions by 2050 came into UK law. By 2050, the UK will need an ultra-low carbon power sector to meet this economy wide net zero emissions target. In parallel, generation will need to increase to meet future demand and to achieve this it is estimated that low carbon electricity generation will need to quadruple by 2050.
12. At a Scottish Government level, a "Climate Emergency" was declared by the First Minister in April 2019. Furthermore, the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 sets a legally binding 'net zero' target for Scotland for 2045 (with challenging binding interim targets), five years ahead of the date set for the whole of the UK.
13. Reference will be made to the clear objective of the Scottish Government to encourage increased deployment and application of renewable energy technologies, consistent with sustainable development policy principles and national and international obligations on climate change.
14. The Proposed Development would clearly contribute to the attainment of renewable energy, electricity and climate change targets at both the Scottish and UK levels and the quantification of this contribution would be described in the forthcoming planning application. The description of the renewable energy policy framework will also refer to the Scottish Government's Climate Change Plan Update (December 2020), The Scottish Energy Strategy (2017) and Onshore Wind Policy Statement (2017).
15. As an essential part of the infrastructure required for a large-scale renewable energy source, it is anticipated that the Proposed Development would be afforded additional positive material weight in the planning balance.

## 4.4 Permitted Development Rights

16. Green Cat Renewables Ltd is not a statutory undertaker for the purposes of The Town and Country Planning (General Permitted Development) (Scotland) Order 1992 (as amended) (GPDO). It is recognised that other organisations that are statutory undertakers benefit from significant permitted development rights for electricity undertakings under Class 40 of the GPDO, subject to prior approval. While the existence or not of permitted development rights is not material, it perhaps suggests that the nature of the Proposed Development warrants focussed assessment.

## 4.5 Key Questions for Council and Consultees

- Q4/1: Can the Council confirm if there are any other current or emerging policy or guidance documents that have not been identified above?
- Q4/2: Can the Council confirm if there are any other key policies that should be considered as part of the planning appraisal in the forthcoming planning application?

# 5 Landscape and Visual Impact

## 5.1 Introduction

1. The Proposed Development will consist of underground cabling and ancillary infrastructure, including a substation and landing point. The Proposed Development will potentially have a direct impact on the physical characteristics of the landscape as well as indirect impacts through the visual presence of the substation on the character of the landscape and other visual receptors in the area.
2. Currently, there are two route options and one substation location option under consideration. The first stage of the landscape and visual impact assessment (LVIA) will be to produce a high-level assessment of each of these to find the option with the least impact and disruption to the landscape and visual resource. Following this, a full LVIA will be conducted on the chosen option.

## 5.2 Guidance

3. The methodology for the LVIA and the Cumulative Landscape and Visual Impact Assessment (CLVIA) has been undertaken in accordance with the methodology set out below and conforms to, *The Guidelines for Landscape and Visual Impact Assessment*, Third Edition (Landscape Institute and IEMA, 2013). Additional guidance has been taken from the following publications:

- National Programme of Landscape Character Assessment: Banff and Buchan, NatureScot Review No. 37, Cobham Resource Consultants, 1997;
- Landscape Character Assessment: Guidance for England and Scotland (Countryside Agency and NatureScot publication, produced by the University of Sheffield and Landuse Consultants), 2002;
- Residential Visual Amenity Assessment, Technical Guidance Note 2/19, Landscape Institute, March 2019; and
- Constructed Tracks in the Scottish Uplands, 2nd Edition, NatureScot, September 2015.

## 5.3 Consultation

4. Consultation with Aberdeenshire Council and NatureScot was undertaken as part of the previous scoping exercise, including, the requirement for any visualisations required to assist the assessment. NatureScot concluded that landscape and visual impacts would be local and would not be commenting further. Aberdeenshire Council noted that *'Visualisations showing the baseline and built development should be included within the EIA Report. The construction compound for the jointing bay should also be included within the visualisations and include any landscaping or mitigation. The visualisations should be based on a ZTV which the Council would be happy to consider and assist with viewpoint selection.'*

## 5.4 Methodology

### 5.4.1 Defining the Study Area

5. An overall study area of 1km buffer from the centre of each of the route options is proposed based on professional experience and was previously accepted by Aberdeenshire Council.

### 5.4.2 Zone of Theoretical Visibility

6. A Zone of Theoretical Visibility (ZTV) will be considered for the substation location, illustrating the visual influence of the buildings. The ZTV, however, does not take account of built development and vegetation, which can significantly reduce the area and extent of actual visibility in the field and as such provides the limits

of the visual assessment study area. In addition to this ZTVs will be produced for the construction compound at the landing point.

### 5.4.3 Baseline Landscape and Visual Resource

7. This part of the LVIA will refer to the existing landscape character, quality or condition and value of the landscape and landscape elements on the site and within the surrounding area, as well as general trends in landscape change across the study area. A brief description of the existing landscape character and land use of the area which includes reference to settlements, transport routes, vegetation cover, as well as landscape planning designations, local landmarks, and tourist destinations.

### 5.4.4 Assessing Landscape Effects

8. Landscape Effects are defined by the Landscape Institute as "*changes to landscape elements, characteristics, character, and qualities of the landscape as a result of development*". The potential landscape effects, occurring during the construction and operation period, may therefore include, but are not restricted to, the following:

- Changes to landscape elements: the addition of new elements or the removal of trees, vegetation, and buildings and other characteristic elements of the landscape character type;
- Changes to landscape quality: degradation or erosion of landscape elements and patterns, particularly those that form characteristic elements of landscape character types;
- Changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities and the cumulative addition of new features, the magnitude of which is sufficient to alter the overall landscape character type of a particular area; and
- Cumulative landscape effects: where more than one wind farm may lead to a potential landscape effect.

9. The development may have a direct (physical) effect on the landscape as well as an indirect effect or effect perceived from out with the landscape character area. Landscape effects will be assessed by considering the sensitivity of the landscape against the degree of change posed by the development. The sensitivity of the landscape to the development is based on factors such as its quality and value and is defined as high, medium or low. Examples of landscape sensitivity and criteria are described below:

- High Sensitivity – This would primarily be rare landscapes, or landscapes which have been afforded either a national or local designation such as National Parks, National Scenic Areas or Areas of Landscape Significance. These landscapes can be fairly dramatic in terms of scale and may feature a number of attractive landscape features, including mature woodland, intricate gorges and river valleys, prominent summits or features of cultural heritage. Man-made features or modifications to the landscape will be minimal and the landscape may have a wild or remote feeling to it;
- Medium Sensitivity – This would include landscapes which are still relatively attractive and generally rural but do contain some man-made elements. It may be landscapes which have been modified to accommodate farming practices and landscapes which include more prominent settlement pattern and road networks. These landscapes may also contain woodland including plantation forestry and shelterbelts; and
- Low Sensitivity – This would only be reserved for landscapes which may be deemed unattractive due to heavy modification and prominent man-made features, such as industrial units.

10. The magnitude or degree of change considers the scale and extent of the Proposed Development , which may include the loss or addition of particular features, and changes to landscape quality, and character. Magnitude can be defined as high, medium, low or negligible, examples of magnitude are shown below:

- High Magnitude – This would be a major change to baseline conditions, where the character of the landscape may be altered from its existing state;

- **Medium Magnitude** – This would be a noticeable change in the baseline condition but not necessarily one which would be enough to alter the character of the landscape and will generally diminish with distance;
- **Low Magnitude** – This would be a minor change to the baseline conditions where the development would be readily missed by a casual viewer and any character of the landscape would remain intact; and
- **Negligible Magnitude** – This would be a change which would be difficult to notice and the baseline conditions are likely to remain almost as they were.

11. The level of effect is determined by the combination of sensitivity and magnitude of change as shown in **Table 3.1.**
12. The significance of any identified landscape or visual effect will be assessed in terms of Major, Major/Moderate, Moderate, Moderate/Minor, Minor or Minor/Negligible. These categories have been based on combining viewer or landscape sensitivity and predicted magnitude of change. The matrices should not be used as a prescriptive tool but will allow for the exercise of professional judgement.
13. Any effects that are classified as Major or Major/Moderate, will be considered to be equivalent to likely significant effects referred to in the EIA Regulations. Careful consideration will also be given to Moderate effects to test whether (in the professional opinion of the landscape architect) they are significant in EIA terms or not. In all cases, whether an effect is significant or not is confirmed within the assessment.

### 5.4.5 Assessing Visual Effects

14. Visual effects are recognised by the Landscape Institute as a subset of landscape effects and are concerned wholly with the effect of the development on views, and the general visual amenity. The visual effects are identified for different receptors (people) who will experience the view at their places of residence, during recreational activities, at work, or when travelling through the area. These may include:

- Visual effect: a change to an existing view, views or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view; and
- Cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect. Either:
  - Simultaneously - where a number of developments may be viewed from a single fixed viewpoint simultaneously within the viewer's field of view without moving;
  - Successively - where a number of developments may be viewed from a single viewpoint successively by turning around at a viewpoint, to view in other directions; and
  - Sequentially - where a number of developments may be viewed sequentially or repeatedly from a range of locations when travelling along a route.

15. The general principles adopted for the assessment of visual effects were taken from *The Guidelines for Landscape and Visual Impact Assessment* Third Edition, produced by the Landscape Institute, 2013. This guidance outlines the approach to define the 'sensitivity' for a given view and a 'magnitude of change' that would be caused by the development in question over its lifetime. A matrix in the Guidance is then used to assess the overall 'level of effect'. This matrix is the same format as used to understand landscape effects and can be seen in **Table 3.1**. Examples of visual sensitivity are highlighted below:

- **High Sensitivity** – These include residential receptors, such as views from individual properties or views from within settlements. Views from both recreational locations, such as hill summits, long distance footpaths, cycle paths and tourist locations such as castles and visitor centres are also considered to be of high sensitivity;
- **Medium Sensitivity** – This would include most other visual receptors such as views from roads, other areas of landscape which would not be classed as recreational areas and views from areas within settlements which would not be considered residential; and

- Low Sensitivity – This would cover views experienced by people at work and views where the existing view is already dominated by significant man-made features.

16. In the context of this project, the effects during operation are always direct and long term. Effects may also be non-cumulative or cumulative. None of the visual effects relating to this project have been considered positive in order to present a worst-case view of any effects.

### 5.4.6 Visual Assessment of Residential Properties

17. A residential amenity assessment for all dwellings inside 1km of the final substation location will be carried out. This will include assessing the impact on the dwelling house, the environs including any driveways or access tracks but not including views from upper floor windows. The assessment may be accompanied by photomontages where appropriate. The *Residential Visual Amenity Assessment*, Landscape Institute, 2019 will be used when conducting this part of the assessment.

### 5.4.7 Predicting Cumulative Landscape Effects

18. The assessment will consider the extent to which the Proposed Development, in combination with other substations, may change landscape character through either incremental effect on characteristic elements, landscape patterns and quality, or by the overall cumulative addition of new features. Identified cumulative landscape effects are described in relation to each individual Landscape Character Area and for any designated landscape areas that exist within the study area.

### 5.4.8 Predicting Cumulative Visual Effects

19. The assessment of cumulative visual effects involves reference to the cumulative visibility ZTV maps and the cumulative viewpoint analysis. Cumulative visibility maps may be used to analyse and identify the residential and recreational locations and travel routes where cumulative visual effects on receptors (people) may occur as a result of the Proposed Development, in this case the substation building. The cumulative visual study will focus on the impact the proposed substation will contribute to cumulative impacts when similar electricity infrastructure is considered.

## 5.5 Baseline

### 5.5.1 Landscape Character

20. The site is located across a number of different landscape character types (LCTs) and will have a direct impact on any which it crosses. There may be some indirect effects on neighbouring LCTs, however given the buried nature of the development this would be unlikely. A detailed assessment of both the direct and indirect impacts on any LCTs within the study area will be key to the LVIA. Each of the LCTs within the study areas are identified below and illustrated in Figure 5.1.

**Table 5.1 – Potential impact on Landscape Character Types**

| Landscape Character Area | Potential Impact |
|---|---|
| **Banff and Buchan Landscape Character Assessment** | |
| Dunes and Beaches from Fraserburgh to Peterhead | Direct and Indirect Impact |
| Cliffs of the North and South East Coasts | Direct and Indirect Impact |
| Eastern Coastal Agricultural Plain | Direct and Indirect Impact |
| Wooded Estates Around Old Deer | Direct and Indirect Impact |
| Agricultural Heartlands | Direct and Indirect Impact |
| Ythan Strath Farmland | Indirect Impact |

| | |
|---|---|
| Northern Rolling Lowlands | Indirect Impact |

### 5.5.2 Landscape Designations

21. Part of the development site is located within the Aberdeenshire Coast Special Landscape Area (SLA) as such it will have some direct impacts as a result of the development as well as indirect effects across the designation. This SLA covers the coastal landscapes between Fraserburgh and Peterhead, and the LVIA will include a detailed assessment of the impact the Proposed Development will have on the special qualities which comprise the SLA. All landscape designations are listed in the table below.

**Table 5.2 – Potential impact on Designated Landscape**

| Landscape Designation | Potential Impact |
|---|---|
| **Aberdeenshire Local Plan** | |
| Aberdeenshire Coast Special Landscape Area | Both options begin within this designation and would have direct and indirect impacts on its character. |

22. An assessment of this landscape designation which is predicted to be impacted by the Proposed Development will be undertaken as part of the LVIA. All other landscape designations, including GDLs, will be scoped out of the LVIA due to there being no direct impacts and the limited visual influence of the Proposed Development

### 5.5.3 Landscape Mitigation and Reinstatement

23. During the trenching of the cable route, any turves will be stored appropriately, vegetated side up, and in piles of not more than two deep. Topsoil will be stored adjacent but separate. The working corridor will be kept to a minimum and any dry-stone dykes or fences removed, will be fully restored.
24. A planting plan will be proposed at the chosen substation which will be specific to the predicted visual impact, with the planting designed to mitigate views from key residential receptors, as well as soften edges and allow the development to blend into the landscape. A ZTV of the substation is provided in Figure 5.2, indicating which residential receptors are likely to be affected.

## 5.6 Summary

25. The Proposed Development may give rise to some significant effects in terms particularly to direct impacts on the landscape character and, while indirect impact will be considerably less, there is some potential that sections of the development such as the substation could cause indirect impacts on the landscape character.
26. It may also have significant effects on visual receptors, including residents, road users, hill walkers and visitors to the area, this is likely to only be as a result of the impact of the substation. As such, a detailed assessment will be undertaken through an LVIA, which will include accompanying maps and visualisations.

## 5.7 Key Questions for Council and Consultees

- Q5/1 Do the Council and consultees agree with the proposed methodology?
- Q5/2 Are the Council or consultees aware of any further guidance or policy documents not mentioned within the report that are relevant to the assessment?
- Q5/3 Do the council have specific locations which they would want to see photomontages produced from?

# 6 Ecology

1. Input into the Scoping Report has been prepared by GLM Ecology. A Desktop Study Ecology Appraisal prepared by GLM Ecology dated September 2021 is included as **Appendix B**.

## 6.1 Baseline

2. The ecology chapter will consider the potential impacts of the Proposed Development on the ecological features (non-avian) present within the site. The chapter will contain a summary of the methods used to establish the baseline conditions within the site and its surroundings, the results of the baseline surveys, and the process used to determine the sensitivity of the habitats and species' populations present. The ways in which habitats or species might be affected (directly or indirectly) by the construction and operation of the Proposed Development will be assessed, prior to and after any mitigation measures are considered. In addition, any cumulative effects will be considered, taking together impacts of other development projects in the area, whether operational, consented or at application stage, along with the significance of any predicted effects of the Proposed Development.
3. All ecology personnel working on the project are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and have extensive experience of cable routes, building developments, solar farms and wind developments. The assessment of effects presented within the EIA Report will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (2018)[6] . The included updates within the Good Practice Guidance for Habitats and Species (2021)[7] will be utilised along with the BS42020 Biodiversity – Codes of Practice for Planning and Development.

## 6.2 Guidance

### 6.2.1 Ecology Legislation

4. The ecology assessment will be carried out in accordance with the principles contained within the following European legislation:

- European Union Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora;
- European Union Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy ("Water Framework Directive"); and
- Environmental Impact Assessment Directive 2014/52/EU.

5. The following national legislation will be considered as part of the ecology assessment:

- The Wildlife and Countryside Act 1981 (as amended);
- The Protection of Badgers Act 1992;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (''The Habitats Regulations'');
- The Water Environment and Water Services (Scotland) Act 2003 (WEWS);
- The Nature Conservation (Scotland) Act 2004 (as amended);

[6] Guidelines for Ecological Impact Assessment (EcIA) CIEEM, 2018, https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/

[7] Good Practice Guidance for Habitats and Species version 3, May 2021, https://cieem.net/wp-content/uploads/2021/05/Good-Practice-Guide-April-2021-v6.pdf

- The Water Environment (Controlled Activities) (Scotland) Regulations 2011;
- The Wildlife and Natural Environment (Scotland) Act 2011; and
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

### 6.2.2 Ecology Guidance

6. The ecology assessment will be carried out in accordance with the principles contained within the following guidance documents:

- CIEEM (2018). Guidelines for ecological impact assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (2nd Edition);
- Collins, J. (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust;
- Historic Environment Scotland and Scottish Natural Heritage (2018). Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland;
- Hundt, L. (2012). Bat Surveys: Good Practice Guidelines (2nd edition). Bat Conservation Trust;
- Joint Nature Conservation Committee (2013). Guidelines for selection of biological Sites of Special Scientific Interest (SSSI);
- Scottish Government; The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011, Scottish Statutory Instruments, 2011/139[8]
- Scottish Executive (2017). Planning Circular 1/2017: Environmental Impact Assessment regulations
- Scottish Executive Environmental Assessment[9];
- Scottish Executive (2019). Scotland's Forestry Strategy (2019-2029)[10]
- Scottish Executive Rural Affairs Department (SERAD) (2000). Habitats and Birds Directives, Nature Conservation: Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the Conservation of Wild Birds (''The Habitats and Birds Directives''). Revised Guidance Updating Scottish Office Circular No 6/1995;
- Scottish Government (2001). European Protected Species, Development Sites and the Planning Systems: Interim guidance for local authorities on licensing arrangements;
- Scottish Government (2010). Management of Carbon-Rich Soils;
- Scottish Government (2016). Draft Peatland and Energy Policy Statement;
- Scottish Government (2017). Draft Climate Change Plan-the draft Third Report on Policies and Proposals 2017-2032;
- SEPA (2017). Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems;

[8] SSI 2011/139 (https://www.legislation.gov.uk/ssi/2011/139/contents/made ) (accessed October 2021)

[9] Scottish Executive (2017). Planning Circular 1/2017 (https://www.gov.scot/publications/planning-circular-1-2017-environmental-impact-assessment-regulations-2017/) (accessed October 2021)

[10] Scotland's Forestry Strategy 2019–2029 (https://www.gov.scot/publications/scotlands-forestry-strategy-20192029/ ) (accessed October 2021)

## 6.3 Consultation

7. **Table 6-1** provides details of consultations undertaken with relevant stakeholders, together with actions undertaken by the Applicant in response to consultation comments. The consultation was in relation to the initial scoping reports produced for the EIA to be undertaken for the proposed development, and this scope has been updated accordingly.

**Table 6-1. Consultation relevant to non-avian Ecology**

| Consultee (&Date Received) | Key Consultee Comments | Application Action |
|---|---|---|
| SEPA (30/03/2022) | SEPA consider that the following key issues must be addressed in the Environmental Impact Assessment process. To avoid delay and potential objection, the information outlined below and in the attached appendix must be submitted in support of the application:<br>• Map and assessment of impacts upon Groundwater Dependent Terrestrial Ecosystems and buffers.<br>SEPA welcome the 'targeted' NVC survey will be undertaken for the whole site and potential High and Moderate GWDTE habitats will be included in this. Avoidance should be the first principle should GWDTE be present with floating tracks or HDD considered as mitigation measures if avoidance is not possible. | Action: the advice is noted and all mapping for GWDTE will be produced for the site according to the Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (LUPS-GU 31, Ver 3, 2017[11]) |
| NatureScot (08/04/2022) | The southernmost option for cable landfall appears to lie outwith but directly adjacent to the protected areas, listed below. If this landfall option is taken forward, the EIA report (EIAR) should fully assess any impacts of the onshore works on the interests of the protected areas listed below.<br>Protected Areas:<br>• Buchan Ness to Collieston Coast Special Area of Conservation<br>• Buchan Ness to Collieston Coast Special Protection Area<br>Bullers of Buchan Coast Site of Special Scientific Interest (SSSI) | Action southern option:<br>If the southernmost cable landfall is taken forward, then the listed protected areas will be included as part of the assessment.<br>For the purposes of the scope, all nature designations within the local area (Northern and southern route options) are included and considered as part of this assessment. |
| | The northern option:<br>It is advised that natural re-exposure of a trenched landfall at this location should be scoped in as a potential effect, due to interruption of coastal sediment transport. This interruption could affect the Loch of Strathbeg SSSI's nationally important coastal geomorphology and dependent habitats. Therefore, consideration should be given to identifying Loch of Strathbeg SSSI as a receptor. | Action northern option:<br>Loch of Strathbeg SSSI will be included and consideration given as a receptor. |

[11] https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf

| | | |
|---|---|---|
| | Protected Species & Biodiversity:<br>It is recommended that biodiversity enhancement should apply to all aspects of nature and that the overriding principle should be to ensure that the development delivers net biodiversity gains. | Action: A Biodiversity Net Gain assessment will be included as part of this assessment. |
| **Head of Planning & Economy, Aberdeenshire Council (11/05/2022)** | Local Nature Conservation Sites (LNCS) in the coastal region are to be addressed within the scoping report. These are to include the following;<br>• LNCS 89: Skelmuir Hill, Stirling Hill and Dudwick is located in the south and would be directly impacted by corridor options 1 and 3.<br>• LNCS 78: Rattray Head to Peterhead is an offshore designation but does cover the coastal area.<br>• LNCS 84: Rora Moss - It is noted that cable route 2 is within the 500m buffer of Rora Moss. Maps are located within the Aberdeenshire Local Development Plan 2017[12].<br>Engagement with Aberdeenshire Council is advised to discuss these aspects. | Action: The inclusion of the LNCS is noted within this assessment and engagement with Aberdeenshire Council will be undertaken to discuss these aspects. |

## 6.4 Survey Methodologies and Assessment

### 6.4.1 Habitat Survey

8. A Phase 1 Habitat Survey, in accordance with the Joint Nature Conservation Committee (JNCC) Methodology 2010 (updated 2016)[13], will be conducted and will include searches for scarce or rare plants.
9. To ensure the collation of complete and current baseline habitat information, a targeted National Vegetation Classification (NVC) survey will be undertaken for the whole site, within the optimum survey window (May to September) following the industry standard survey methodology (Rodwell, 2006).

### 6.4.2 Ground Water Dependent Terrestrial Ecosystems (GWDTE)

10. SEPA has a responsibility to protect groundwater abstractions and Groundwater Dependant Terrestrial Ecosystems (GWDTE). Foundations, borrow pits and linear infrastructure such as roads, tracks and trenches can disrupt groundwater flow and impact upon these sensitive receptors. Such impacts will vary depending on the scale and location of the development.
11. The study area will comprise all likely relevant habitat types within the Site and out to 300m (to allow for potential micrositing beyond the 250m buffer as per GWDTE guidance) to comply with SEPA guidance with regards to the identification of GWDTEs for subsequent hydrological assessment. The survey will seek to record the extent of any notable vegetation communities within the study area, including those classified as GWDTEs in accordance with Sniffer guidance (2009).
12. The results of these surveys will be used to inform a constraints plan. The principal mitigation measures adopted will be the use of buffer zones around sensitive areas of habitat, sensitive construction techniques

[12] https://www.aberdeenshire.gov.uk/planning/plans-and-policies/aberdeenshire-local-development-plan-2017/
[13] JNCC, (2010), Handbook for Phase 1 habitat survey – a technique for environmental audit, JNCC, Peterborough. Updated with corrections 2016. https://hub.jncc.gov.uk/assets/9578d07b-e018-4c66-9c1b-47110f14df2a

and habitat management/restoration where appropriate. Significant impacts from the scheme will be identified using published CIEEM Guidelines.

### 6.4.3 Water Crossings

13. The route traverses a number of water courses which range in size from ditch systems to small rivers and tributaries of rivers. Some of these are associated with salmon and trout. The River Ythan Trust and Ugie River Salmon Fishery Board will be contacted to determine the level and type of surveys required.

### 6.4.4 Mammal Survey

14. Surveys will be undertaken within a buffer of up to 100 or 250m of the planned infrastructure, to take into account variations in micrositing. Surveys for terrestrial mammals will follow current NatureScot guidance[14] and will comprise walkover searches for evidence of presence or the potential presence of bats, badger, otter, water vole, red squirrel and pine marten. The surveys will include checks for any suitable bat roost structures, specifically within trees and the Bat Conservation Trust Guidance will be followed for bat surveys[15].

### 6.4.5 Bats

15. All species of bats occurring in Scotland are classed as European Protected Species (EPS) under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). For any wild bat species, it is an offence to deliberately or recklessly:

- Capture, injure or kill a bat;
- Harass a bat or group of bats;
- Disturb a bat in a roost (any structure or place it uses for shelter or protection);
- Disturb a bat while it is rearing or otherwise caring for its young;
- Obstruct access to a bat roost or otherwise deny an animal use of a roost;
- Disturb a bat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species; and
- Disturb a bat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

16. It is also an offence to:

- Damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly), and
- Keep, transport, sell or exchange, or offer for sale or exchange any wild bat (or any part or derivative of one) obtained after 10 June 1994.

17. This means that if bats could be affected in these ways by a development, and no action is taken to prevent it, an offence may be committed. Surveys for bats will be required if trees or buildings are to be removed. Any tree or structure to be removed will require a Potential Roost Assessment to be carried out. This determines if the tree or building has bat roost potential. If this is positive, then bat roost surveys following the appropriate methodology will be carried out. Surveys will be:

[14] NatureScot: Planning and development: protected species; https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-protected-species

[15] Collins, J. (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). https://www.bats.org.uk/resources/guidance-for-professionals/bat-surveys-for-professional-ecologists-good-practice-guidelines-3rd-edition

- No more than 18 months old;
- Carried out in line with the Bat Surveys for Professional Ecologists: Good Practice Guidelines (BCT, Collins 2016).

18. The surveys will establish presence or absence of roosts and if bats are present the species, numbers (or estimated numbers), function of the roost and flight lines away from the roost. See Collins (BCT, 2016).

### 6.4.6 Badgers

19. Both badgers and their setts are protected by law. The Protection of Badgers Act 1992 (Scottish Version) brings together all the previous legislation specific to badgers (except their inclusion on Schedule 6 of the 1981 Wildlife and Countryside Act, as amended Nature Conservation (Scotland) Act 2004). As a result, it is an offence to:

- Willfully kill, injure, possess or cruelly ill-treat a badger, or attempt to do so;
- To intentionally or recklessly interfere with a sett;
- To disturb a badger when it is occupying a sett;
- Damage or destroy a sett; and
- To obstruct access to, or any entrance of a badger sett.

20. A badger sett is defined in the legislation as ‘any structure or place, which displays signs indicating current use by a badger’. 'Current use' does not simply mean 'current occupation' and for licensing purposes it is defined as 'any sett within an occupied badger territory regardless of when it may have last been used'. A sett therefore, in an occupied territory, is classified as in current use even if it is only used seasonally or occasionally by badgers, and is afforded the same protection in law.

### 6.4.7 Badger Survey Methodology

21. The Proposed Development area (red line boundary) plus a buffer around the site will be surveyed. A standard buffer around the site will be 100m to give consideration to setts out with, but close to, the development. This buffer will only be increased to larger distance around the site if the works within the site may be disturbing (e.g., blasting).

22. All land within the survey area will be surveyed for badgers. This involves viewing all areas of the survey area for setts or other field signs. Badgers will commute from setts to foraging areas along paths, and they will demarcate their territories using dung in pits, often positioned along linear features which form the boundaries of their territory. Open areas such as grazed fields/edges of plantations will be surveyed.

23. Transects lines will be walked through the habitat to ensure full ground coverage. The distance between the transect lines will be dependent on the density of the vegetation cover. For example, transect lines in coniferous plantation such as Sitka spruce will need to be positioned at 5m intervals, whereas in open broadleaved woodland, ground cover may permit transects to be 20m apart. Linear landscape features such as walls and fences will also be walked along in order to identify any territory markings or badger crossing points.

24. A total sett survey will be conducted on site, including determination of where the badgers roam, feed and obtain water. This information will ensure that any future development, will not interfere with the mammal’s pathway to its food & water supply, as well as the setts.

25. The sett survey will include the total number of holes within a sett; number of well used holes & disused holes, which can give a guide to the level of activity of the sett.

26. Classification of the sett will also be determined into Main, Annex, Subsidiary or Outlier setts. During the survey, each sett entrance will be classified according to its degree of usage:

- Well Used (WU) are clear of debris and vegetation, sides worn smooth but not necessarily excavated recently;
- Partially used (PU) are not in regular use and have debris e.g. twigs and leaves in the entrance. They could be used after only a minimal amount of clearance; and
- Disused (D) not in use for some time, are partially blocked and could not be used without considerable effort. If the hole has been disused for some time all that may be visible is the overgrown spoil heap and a depression in the ground where the hole used to be. Rabbits and foxes may take over part of a sett and keep disused entrances open.

27. Field signs of badgers will also be recorded such as path networks, latrines and larger territorial latrines at boundary edges. Evidence of badger activity searched for will include the following:

- Setts: badger setts typically have characteristic shapes and dimensions;
- Paw prints and badger hair caught on hedges and fences;
- Scratching posts
- Foraging signs: foraging badgers leave distinctive marks when foraging, such as diggings or snuffle holes (where badgers have inserted their snouts into the ground to search for earthworms and insects);
- search for earthworms and insects);
- Characteristic worn pathways and Paths linking setts and foraging areas; and
- Latrines: badgers defecate in pits, often clustering several pits into a latrine.

### 6.4.8 Otters

28. As a European protected species, the otter is fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). It is an offence to deliberately or recklessly:

- Capture, injure or kill an otter;
- Harass an otter or group of otters;
- Disturb an otter in a holt or any other structure or place it uses for shelter or protection;
- Disturb an otter while it is rearing or otherwise caring for its young;
- Obstruct access to a holt or other structure or place otters use for shelter or protection, or otherwise deny the animal use of that place;
- Disturb an otter in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species; and
- Disturb an otter in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

29. It is also an offence to:

- Damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly), and
- Keep, transport, sell or exchange, or offer for sale or exchange any wild otter (or any part or derivative of one) obtained after 10 June 1994.

30. Otter shelters are legally protected whether or not an otter is present. Otters could be affected by a development proposal close to a water course, wetland, coastline or estuary.

### 6.4.9 Otter Survey Methodology

31. An otter survey will be carried out for the proposal within 200m of suitable habitat. Otter surveys can be carried out at any time of year but will avoid periods following prolonged heavy rainfall and/or high water when spraints and other signs of otter may have been washed away. Heavy frost or recent snow can also make finding spraints difficult. All suitable otter habitat within 200m of the proposed works will be surveyed, including a systematic search for:

- Spraints or otter faeces. Often found on boulders, under bridges, elevated positions, fallen trees or on piles of grass;
- Paw prints in muddy or silted areas along the burn edges;
- Hairs;
- Characteristic worn pathways/slides or haul out areas;
- Food remains;
- Sleeping and resting places/shelters including holts, couches and natal dens; and
- Breeding sites.

32. Type of otter activity (Holts & Couches) explained further:

- Holts: otter holts are often found in various situations. These include cavities in a riverbank, hollow trees, between roots, rocky clefts, rabbit burrows or tunnels in peat. The entrance may be underwater with an air vent into the chamber, which is lined with dry vegetation; and
- Couches: otters often have resting spots or couches whey they lay up. An otter may have many holts or resting sites within its home range.

33. Field signs for recognising a natal den can include:

- A heavily used path or paths from the water into dense cover or an enclosed structure;
- Bedding within the structure which may consist of grass, ferns or reeds (bedding may also be present in other types of resting places);
- A latrine containing a large number of spraints at the den or within 2m of it (this is not always the case – sometimes the female will excrete in the water to ensure that there are no signs of occupation near the natal den);
- A cub play area which may be a well-worn area around a tree or on a bank; and
- Different sized otter prints

34. Habitat types associated with breeding sites are:

- Extensive reed beds;
- Ponds and lakes;
- Deciduous woodlands;
- Young conifer plantations; and
- Extensive areas of scrub.

### 6.4.10 Water Vole

35. The water vole receives partial protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). See the Wildlife and Countryside Act 1981 Schedules 5 and 6 for full details.

36. In Scotland, this legal protection is currently restricted to the water vole's places of shelter or protection and does not extend to the animal itself, but are listed on the UK BAP. Full protection, to also cover the animal, is proposed. It is an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure or place that water voles use for shelter or protection, and
- Disturb a water vole while it is using any such place of shelter or protection.

### 6.4.11 Water Vole Survey Methodology

37. Timing: The water vole breeding season runs from April to September. This is the ideal time to carry out a water vole survey as the water voles will be highly active and leave many signs, such as latrines (conspicuous piles of droppings) which can be used to confirm their presence during a survey. Habitat assessments can also be undertaken during winter. Surveys at that time can determine presence, although absence of water voles can only be confirmed by spring or summer surveys.
38. Habitat Assessment: As part of the water vole survey, the habitat suitability for this species will be assessed. This will include an assessment of the foraging resources, the suitability of the banks for burrowing and the presence of adequate cover/shelter.
39. Surveying for Water Vole Evidence: A water vole survey will involve searching the banks of the watercourse for evidence of water vole including: burrows, latrines, footprints, runs in the vegetation, grazed 'lawns', feeding remains and actual sightings.
40. The following field signs include:

- Faeces - these are 8- 12mm long and 4- 5 mm wide, cylindrical with blunt ends. The colour is variable, though often green, and they are generally odourless or have a faint musky smell;
- Latrines - the majority of droppings are deposited at latrine sites, used to mark range boundaries or favoured spots close to burrows. Latrines are typically maintained between February and November and often consist of a flattened mass of old droppings topped with fresh ones;
- Feeding stations - water voles often bring pieces of cut vegetation to favoured feeding stations close to the water's edge and leave remains in neat piles;
- Burrows - many burrows can be found in riverbanks, but those constructed by water voles are typically wider than they are high, with a diameter of 4- 8cm. Around these holes, well-grazed 'lawns' can often be found, where the water voles have chewed the vegetation short; and
- Footprints - these can easily be confused with rat footprints.

41. Many of these signs may be obliterated by heavy rain or high-water levels, so negative surveys carried out in these circumstances should be treated with caution.

### 6.4.12 Red Squirrel

42. Red squirrels and their dreys (resting places) receive full protection under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally or recklessly:

- Kill, injure or take a red squirrel
- Damage, destroy or obstruct access to a drey or any other structure or place which a red squirrel uses for shelter or protection
- Disturb a red squirrel when it is occupying a structure or place for shelter or protection

43. This protection does not apply to areas where red squirrels only feed.

44. It is also an offence to possess or control, sell or offer for sale, or possess or transport for the purpose of sale any living or dead red squirrel or any derivative of such an animal. Knowingly causing or permitting any of the above acts to be carried out is also an offence.

### 6.4.13 Red Squirrel Survey Methodology

45. Red squirrels can occur in various types of woodland, including gardens and parkland. Where red squirrels might be present, consideration is required if the Proposed Development includes the following:

- Felling trees that have a reasonable chance of containing dreys- suitable trees are usually 15 years or older and can be conifer or broadleaf species, or
- Felling and other works that could disturb dreys. This is likely to be where works are within 50m of trees containing a drey during the red squirrel breeding season (February to September inclusive). If works are confined to the non-breeding season, then the risk of disturbing red squirrels is much lower and only likely to occur where works are within 5m or one tree's distance of a potential drey location (whichever is less).

46. A red squirrel survey should be carried out if a proposal could potentially impact on red squirrels in these ways.

47. Surveys will follow the survey methods as detailed in the Practical techniques for Surveying and Monitoring squirrels (Forestry Commission, 2009) and will consider the following:

- Surveys can be carried out at any time of year, as red squirrels are active all year round. However, it is quicker and easier to survey broadleaved or larch woodland in the winter when the squirrels and their dreys are more easily seen.
- Surveys of squirrel activity will commence as soon after first light as possible, as this is the time when squirrels are most likely to be active.
- Surveying in heavy rain, strong winds or when it is very cold will be avoided, as red squirrels are less likely to be active.
- Use on non-invasive survey methods, such as,
  - Visual surveys
  - Hair-tube surveys
  - Drey counts
  - Feeding sign surveys
  - Whole maize bait
- A basic sampling method or distance sampling method may be applied.
- Population density may be calculated from the distance sampling data.

### 6.4.14 Pine Marten

48. Pine martens are the second rarest carnivore in the UK. The pine marten receives full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Certain methods of killing or taking pine martens are illegal under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). It is an offence to intentionally or recklessly:

- Kill, injure or take a pine marten;
- Damage, destroy or obstruct access to a nest or den – i.e. any structure or place which such an animal uses for shelter or protection; and

- Disturb such an animal when it is occupying a nest or den for shelter or protection (except when this is inside a dwelling house).

49. Possession, sale and transport offences are ones of strict liability (they don't require intention or recklessness). It is an offence to:

- Possess or control, sell, offer for sale, or possess or transport for the purpose of sale any living or dead pine marten or any derivative of such an animal, and
- It is also an offence to knowingly cause or permit any of the above acts to be carried out.

### 6.4.15 Pine Marten Survey Methodology

50. The survey will include a systematic search for signs of pine marten presence and potential den sites within 250m of a development. Pine martens are elusive and largely nocturnal, which makes them difficult to see, but their scats are often quite distinctive and the most commonly encountered field sign. Scats are most easily found along forest tracks. Scat is highly variable depending on diet but classic pine marten scat is highly twisted and contains bone fragments and hair. Pine marten scat also has a sweet parma violet fragrance. Pine martens prefer overhead cover in woods and their dens can be found in large holes or cavities in trees and breeding nests can be found in rocks, in hollow trees or in a bird's or squirrel's nest. Pine martens are active all year round but are best surveyed between May and September, and ideally in June-August when scats are most abundant. Pine martens are more active at this time (June-August) and weather conditions or leaf litter are less likely to degrade or obscure scats. DNA analysis of scat samples is commonly used to provide a positive identification.

51. The use of hair tubes and remote infra-red cameras can also be used to confirm the presence of pine martens. Camera traps can also be used to confirm the occupation of den sites and to determine if they are being used for breeding (March-June inclusive). However, using camera traps close to a potential breeding den can cause disturbance and will require a survey licence from NatureScot.

## 6.5 Assessment Methodology

52. The assessment of effects on the ecological features presented within the EIA Report will consider the potential for significant effects upon important features, as a result of the construction, operational and decommissioning phase of the Proposed Development. Assessment will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (2018) and will include the following stages:

- Determination and evaluation of important ecological features;
- Identification and characterisation of impacts;
- Outline of mitigating measures to avoid and reduce significant impacts;
- Assessment of the significance of any residual effects after such measures;
- Identification of appropriate compensation measures to offset significant residual effects; and
- Identification of opportunities for ecological enhancement.

## 6.6 Baseline Methodology

53. The assessment of effects on the ecological features presented within the EIA Report will be consider the potential for significant effects upon important features, as a result of the construction, operational and decommissioning phase of the Proposed Development. Assessment will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (2018) and will include the following stages:

- Determination and evaluation of important ecological features;
- Identification and characterisation of impacts;
- Outline of mitigating measures to avoid and reduce significant impacts;
- Assessment of the significance of any residual effects after such measures;
- Identification of appropriate compensation measures to offset significant residual effects; and
- Identification of opportunities for ecological enhancement.

## 6.7 Baseline Methodology

54. The Proposed Development Site is located in Aberdeenshire and connects from the east coast either north (St Fergus) or south (Boddam) of Peterhead and the route then traverses through arable countryside to New Deer connection. Baseline ecological conditions to inform the design and assessment of the Proposed Development, will be established by means of:

- Desk-based assessments of existing available data and information;
- Consultations with stakeholders; and
- Site-specific field surveys and monitoring.

55. The process will identify sensitive receptors, particularly those that are the subject of statutory or local designations. Constraints will be identified and used to inform the final development of the turbines and infrastructure layout. The desk study will include a review of, but not limited to:

- Existing data on statutory designated sites available through NatureScot Sitelink website[16] (up to 5 km from the site);
- Scotland's Environment[17];
- Magic Map DEFRA[18];
- Existing data on non-statutory designated sites available through the proposed Aberdeenshire Council Local Development Plan 2020 (ALDP) [19] & ALDP 2022[20], if complete (up to 2km from the site) (See **Table 6-2**);
- Records of Ancient Woodland (up to 2km from the site);
- Records from the Aberdeenshire Council Biodiversity Officer;
- Records from Scottish Badgers[21];
- The UK Biodiversity Action Plan (UKBAP)[22];
- The Scottish Biodiversity List[23]; and
- Biological information from the North East Scotland Biological Records Centre for Aberdeenshire (NESBReC)[24].

[16] NatureScot Sitelink; https://sitelink.nature.scot/home
[17] Scotland's Environment; https://www.environment.gov.scot
[18] MAGIC Map; https://magic.defra.gov.uk/home.htm
[19] Proposed Aberdeenshire Local Development Plan 2020 https://www.aberdeenshire.gov.uk/planning/plans-and-policies/pldp-2020/
[20] Aberdeenshire Local Development Plan 2022 (awaiting finalisation) https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2022/
[21] Scottish Badgers; https://www.scottishbadgers.org.uk
[22] https://jncc.gov.uk/our-work/uk-bap-priority-species/
[23] The Scottish Biodiversity List; https://www.nature.scot/scottish-biodiversity-list
[24] North East Scotland Biological Records Centre http://www.nesbrec.org.uk

56. Table 6-2 details the non-statutory designated sites within 2km of the Proposed Development that have ecological interests.

**Table 6-2. Non-statutory designated sites within 2km of the Proposed Development**

| Non-statutory designated sites within 2km of the Proposed Development | | |
|---|---|---|
| **Name** | Distance (km) | Comments |
| **LNCS 89: Skelmuir Hill, Stirling Hill and Dudwick** | The southern route passes through this LNCS at its nearest point. | Directly impacted by the southern route. |
| **LNCS 78: Rattray Head to Peterhead** | Directly east of the proposed northern route. | An offshore designation but does cover the coastal area. |
| **LNCS 84: Rora Moss** | ~1km to the north of the proposed northern route. | The northern route passes c.1km to the south of Rora Moss LNCS at its nearest point. |

57. Table 6-3 details the designated sites located within 5km of the Proposed Development that have ecological interests.

**Table 6-3. Ecologically and geomorphology designated sites within 5km of the Proposed Development**

| Ecologically designated sites within 5km of the Proposed Development | | | |
|---|---|---|---|
| **Name** | Distance (km) | Qualifying Interests | Status |
| **Hill of Longhaven SSSI**[25] | Within 200m survey extent of the southern route option | Quaternary geology & geomorphology | Unfavourable Declining (2010) |
| **Rora Moss SSSI**[26] | 2km north of the northern route option. | Raised bog | Unfavourable No change (2021) |
| **Loch of Strathbeg SSSI**[27] | 7.7km (considered due to potential impact on sand dunes). | Sand dune, salt marsh, Open water transition fen, Fen-meadow etc. | Favourable maintained (& various) (2021) |
| **Buchan Ness to Collieston Coast SAC**[28]**, SPA**[29] | The southern route option traverses the SSSI. | Vegetated sea cliffs,<br>Supports seabirds including nationally important populations | Favourable maintained (& various) (2017) |
| **Bullers of Buchan Coast SSSI**[30] | The southern route option traverses the SSSI. | Seabird colonies & geomorphology | Favourable recovered (& various) (2016) |
| **Moss of Cruden SSSI**[31] | Located 2.8km to the south of the southern route option at its nearest point. | Quaternary geology & geomorphology | Favourable maintained (2007) |
| **Kirkhill SSSI**[32] | 4km to the north of the northern route option. | Quaternary geology & geomorphology | Favourable maintained (2010) |

[25] https://sitelink.nature.scot/site/785
[26] https://sitelink.nature.scot/site/1371
[27] https://sitelink.nature.scot/site/1040
[28] https://sitelink.nature.scot/site/8214
[29] https://sitelink.nature.scot/site/8473
[30] https://sitelink.nature.scot/site/271
[31] https://sitelink.nature.scot/site/1197
[32] https://sitelink.nature.scot/site/872

| | | | |
|---|---|---|---|
| **Southern Trench Nature Conservation MPA**[33] | 2.1km to the east of the northern route option however, it is an offshore designation. | Borrowed mud, Fronts, Minke whale, Shelf deeps, Quaternary geology, and Submarine Mass Movement. | Favourable (2019) |

58. Baseline ecology field surveys will comprise the following:

- Terrestrial habitat & vegetation survey, and
- Terrestrial mammal survey (protected species).

## 6.8 Mitigation

59. The adoption of embedded mitigation measures to avoid or minimise adverse impacts upon ecological features will be part of the iterative design process for the Proposed Development. Measures to avoid or otherwise minimise potentially adverse impacts upon ecological features during scheme design will include:

- Land-take: Development infrastructure will be designed to minimise the requirement for land-take and the number of watercourse crossings or horizontal directional drilling;
- Watercourse crossings: New watercourse crossings required will be designed in accordance with best practice and enable the free passage of fish and other wildlife;
- Construction Environmental Management Plan: A Construction Environmental Management Plan (CEMP) will be in place during the construction, operational and decommissioning phases of the development. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the development in line with current guidance.
- ECoW: It would be expected that the ECoW would undertake pre-construction protected species surveys during the appropriate survey months prior to construction.

60. Full details of embedded and site-specific mitigation measures in relation to ecology will be detailed within the EIA Report.

## 6.9 Reporting

61. The final report will provide commentary across each phase of the development process construction, operation, and decommissioning.

### 6.9.1 Construction Phase

62. During the construction phase of the Proposed Development, in the absence of mitigation, adverse effects upon ecological features to be addressed within the EIA Report may arise from:

- Habitat loss, fragmentation, severance or change as a result of the delivery and installation of development infrastructure; and
- Disturbance, inadvertent killing or injuring of protected or otherwise notable species or inadvertent damage to their breeding sites or resting places.

63. There will be no direct impacts upon any designated site for nature conservation. The potential for indirect effects upon ecological features, including designated sites, as a result of the potential spillage and/or mitigation of pollutants during the construction phase will be considered, however, potentially significant effects are considered to be highly unlikely on the basis of spatial separation and on the basis of best practice

[33] https://sitelink.nature.scot/site/10477

construction methods and pollution prevention controls. The requirement for new watercourse crossings and horizontal directional drilling, will also be minimised as part of the iterative design process and where required be of a sensitive design, to ensure the free passage of water vole, fish and other wildlife beneath. This will include avoidance of peatland and woodland designated within the Ancient Woodland Inventory (AWI) as part of the iterative design process.

### 6.9.2 Operational Phase

64. During operation of the Proposed Development, in the absence of mitigation, adverse effects upon ecological features to be addressed within EIA Report may arise from:

- Disturbance to protected or otherwise notable species as a result of operational activities such as vehicular traffic and maintenance works;
- Habitat loss or change, inadvertent killing or injuring of protected or otherwise notable species resulting from the potential spillage and/or mitigation e of pollutants

65. Such effects are however, considered highly unlikely to be significant due to the nature of the Proposed Development, requiring low levels of continued human presence after commissioning and the incorporation of best practice pollution prevention controls. The incorporation of buffers from European protected species habitat features (e.g. woodland and watercourses) will also form part of the iterative design process.

### 6.9.3 Decommissioning Phase

66. Potential impacts associated with the decommissioning phase are likely to be similar to those identified for the construction phase.

### 6.9.4 Presentation of sensitive information

67. Ecological data considered sensitive (e.g. that pertaining to the locations of breeding and/or resting places of protected species) will be included in a confidential appendix to the EIA Report. This will not be made publicly available but will be issued to NatureScot.

### 6.9.5 Further Consultation

68. Further consultation with NatureScot and Aberdeenshire Council is proposed in relation to the scope of ecological baseline information gathering at the earliest convenience.

## 6.10 Questions

- Q6/1: Do consultees agree that the range of ecological surveys proposed is sufficient and proportionate to inform the design and assessment of the Proposed Development?
- Q6/2: Do consultees agree that the full range of likely effects to be assessed within the EIA Report has been adequately identified and is proportionate to the nature of the Proposed Development?
- Q6/3: Are there any other relevant consultees who should be contacted with respect to the ecology assessment and scope of baseline information gathering?

# 7 Ornithology

1. Input into the Scoping Report has been prepared by GLM Ecology.

## 7.1 Introduction

2. This chapter will consider the potential impacts of the Proposed Development on the ornithological features present within the site. They will summarise the methods used to establish the baseline conditions within the site and its surroundings, the results of the baseline surveys, and the process used to determine the sensitivity of the bird species' populations present in their habitats. The ways in which bird species and their habitats might be affected (directly or indirectly) by the construction, operation and decommissioning of the Proposed Development will be assessed, prior to and after any mitigation measures are considered. In addition, any cumulative effects will be considered, taking together impacts of other development projects in the area, whether operational, consented or at application stage, along with the significance of any predicted effects of the Proposed Development.
3. All ornithological personnel working on the project are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and have extensive experience of cable routes, building developments, solar farms and wind developments. The assessment of effects presented within the EIA Report will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (2018).

## 7.2 Guidance

### 7.2.1 Ornithology Legislation

4. The ornithology assessment will be carried out in accordance with the principles contained within the following European legislation:

- European Union Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora;
- European Union Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy ("Water Framework Directive"); and
- Environmental Impact Assessment Directive 2014/52/EU.

5. The following national legislation will be considered as part of the ornithological assessment:

- The Wildlife and Countryside Act 1981 (as amended);
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (''The Habitats Regulations'');
- The Water Environment and Water Services (Scotland) Act 2003 (WEWS);
- The Nature Conservation (Scotland) Act 2004 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2010; and
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

### 7.2.2 Ornithology Guidance

6. The ornithological assessment will be carried out in accordance with the principles contained within the following guidance documents:

- CIEEM (2018). Guidelines for ecological impact assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (2nd Edition);
- Joint Nature Conservation Committee (2013). Guidelines for selection of biological Sites of Special Scientific Interest (SSSI);
- Scottish Executive (2019). Scotland's Forestry Strategy (2019-2029) https://www.gov.scot/publications/scotlands-forestry-strategy-20192029/ ;
- Scottish Executive Rural Affairs Department (SERAD) (2000). Habitats and Birds Directives, Nature Conservation: Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the Conservation of Wild Birds (''The Habitats and Birds Directives''). Revised Guidance Updating Scottish Office Circular No 6/1995;
- Scottish Government (2001). European Protected Species, Development Sites and the Planning Systems: Interim guidance for local authorities on licensing arrangements;
- Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015). Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746;
- Scottish Natural Heritage (2016). Assessing connectivity with Special Protection Areas.

## 7.3 Consultation

7. **Table 7-1** provides details of consultations undertaken with relevant stakeholders, together with actions undertaken by the Applicant in response to consultation comments. The consultation was in relation to the initial scoping reports produced for the EIA to be undertaken for the proposed development, and this scope has been updated accordingly.

**Table 7-1. Consultation relevant to Ornithology**

| Consultee (& Date Received) | Key Consultee Comments | Application Action |
|---|---|---|
| NatureScot (08/04/2022) | The southernmost option for cable landfall appears to lie outwith but directly adjacent to the protected areas, listed below. If this landfall option is taken forward, the EIA report (EIAR) should fully assess any impacts of the onshore works on the interests of the protected areas listed below.<br><br>Protected Areas:<br>• Buchan Ness to Collieston Coast SAC<br>• Buchan Ness to Collieston Coast SPA<br>• Bullers of Buchan Coast SSSI | Action southern option:<br>If the southernmost cable landfall is taken forward, then the listed protected areas will be included as part of the assessment.<br>For the purposes of the scope, all nature designations within the local area (Northern and southern route options) are included and considered as part of this assessment, and in particular where it relates to ornithology and habitats that supports birds. |
| | NatureScot advise that work at the seaward HDD emergence point during the seabird breeding season is likely to cause disturbance to a substantial proportion of the SPA breeding bird populations and may have an adverse effect on the integrity of the SPA. Disturbance to seabirds using the waters of the marine section of the SPA also needs to be considered. | Action: The points are noted and seabird breeding surveys will be undertaken if works are to be programmed during the seabird breeding season. |

| | | |
|---|---|---|
| | However, if these elements of the HDD works are carried out outwith the seabird breeding season, they are not likely to have a significant effect on the SPA. | |
| | Protected Species & Biodiversity:<br>It is recommended that biodiversity enhancement should apply to all aspects of nature and that the overriding principle should be to ensure that the development delivers net biodiversity gains. | Action: A Biodiversity Net Gain assessment will be included as part of this assessment, and in particular where it relates to ornithology and habitats that supports birds. |
| Head of Planning & Economy, Aberdeenshire Council (11/05/2022) | Local Nature Conservation Sites (LNCS) in the coastal region are to be addressed within the scoping report. These are to include the following;<br>• LNCS 89: Skelmuir Hill, Stirling Hill and Dudwick is located in the south and would be directly impacted by corridor options 1 and 3.<br>• LNCS 78: Rattray Head to Peterhead is an offshore designation but does cover the coastal area.<br>• LNCS 84: Rora Moss - It is noted that cable route 2 is within the 500m buffer of Rora Moss.<br>Maps are located within the Aberdeenshire Local Development Plan 2017[34].<br>Engagement with Aberdeenshire Council is advised to discuss these aspects. | Action: The inclusion of the LNCS is noted within this assessment and engagement with Aberdeenshire Council will be undertaken to discuss these aspects, and in particular where it relates to ornithology and habitats that supports birds. |
| | Aberdeenshire Council would also request sight of the ornithology confidential appendix and confirm the contents will not be shared publicly. | Action: Noted and the confidential appendix will be shared with Aberdeenshire Council. |

## 7.4 Survey Methodologies & Assessment

### 7.4.1 Key Target Species

8. Key target species for the assessment have been identified following NatureScot (SNH, 2018a) guidance using the following criteria:

- Species listed on Annex 1 of the EU Birds Directive;
- Species listed on Schedule 1 of the 1981 Wildlife & Countryside Act;
- Red-listed species on the Birds of Conservation Concern list (Eaton et al. 2015).

9. The ornithological assessment will, therefore, give particular consideration to all species recorded during the baseline surveys at the site that meet any of these criteria.

### 7.4.2 Vantage Point Survey Methodology

10. No Vantage Point (VP) surveys will be undertaken for the Proposed Development as Collision Risk Mortality for any Schedule 1 bird species of Birds of Conservation Concern (BoCC) will be zero due to the construction and operation methodology.

[34] https://www.aberdeenshire.gov.uk/planning/plans-and-policies/aberdeenshire-local-development-plan-2017/

### 7.4.3 Breeding Bird Survey Methodology

11. Three breeding bird survey (BBS) visits will be carried out between April and June, targeting all areas of suitable habitat within 500m of the proposed onshore cable corridor and its infrastructure, as detailed in SNH, 2017.

### 7.4.4 Ornithological Survey Timelines

12. It is considered that the above survey effort is sufficient to allow a robust characterisation of the baseline ornithological assemblage and usage of the Proposed Development site and surrounding area, when used in combination with the information and data sets collated from other sources.

## 7.5 Assessment Methodology

13. The assessment of effects on the ecological features presented within the EIA Report will be consider the potential for significant effects upon important features, as a result of the construction, operational and decommissioning phase of the Proposed Development.
14. Assessment will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (2018) and will include the following stages:

- Determination and evaluation of important ecological features;
- Identification and characterisation of impacts;
- Outline of mitigating measures to avoid and reduce significant impacts;
- Assessment of the significance of any residual effects after such measures; and
- Identification of appropriate compensation measures to offset significant residual effects; and
- Identification of opportunities for ecological enhancement.

## 7.6 Baseline

15. The site is located across arable countryside with woodland and water courses in Aberdeenshire, from the east coast in the vicinity of Peterhead to New Deer. Baseline ornithological conditions to inform the design and assessment of the Proposed Development, will be established by means of:

- Desk-based assessments of existing available data and information;
- Consultations with stakeholders; and
- Field surveys and monitoring.

16. The process will identify sensitive receptors, particularly those that are the subject of statutory or local designations. Constraints will be identified and used to inform the final development of the turbines and infrastructure layout. The ornithological desk study will include a review of, but not limited to:

- Existing data on statutory designated sites available through NatureScot Sitelink website (up to 20 km from the site), specifically where the qualifying feature is related to birds;
- Scotland's Environment;
- Magic Map DEFRA;

- Existing data on non-statutory designated sites available through the Aberdeenshire Council Local Development Plan 2017[35] (ALDP) specifically, where the qualifying feature is related to birds;
- Ornithological specific records from the Aberdeenshire Biodiversity Officer;
- Records from the North East Scotland Raptor Study Group;
- The UK Biodiversity Action Plan (UKBAP);
- The Scottish Biodiversity List; and
- North-East Scotland Biological Records Centre (NESBReC[36])

17. Table 7.2 details the designated sites located within 2km of the Proposed Development that have ornithological interests.

**Table 7.2 - Ecologically designated sites within 20km of the Proposed Development**

| Ecologically designated sites within 2 km of the Proposed Development | | | |
|---|---|---|---|
| **Name** | **Distance (km)** | **Qualifying Interests** | **Status** |
| **Buchan Ness to Collieston Coast SPA** | 0.3 | Birds:<br>Seabird assemblage, breeding<br>Fulmar (Fulmarus glacialis), breeding<br>Herring gull (Larus argentatus), breeding<br>Guillemot (Uria aalge), breeding<br>Kittiwake (Rissa tridactyla), breeding<br>Shag (Phalacrocorax aristotelis), breeding | <br>Favourable Recovered<br>Unfavourable Declining<br>Unfavourable No change<br>Favourable Maintained<br>Unfavourable No change<br>Unfavourable No change |
| **Bullers of Buchan Coast SSSI** | 1.8 | Birds:<br>Seabird colony, breeding<br>Kittiwake (Rissa tridactyla), breeding<br>Guillemot (Uria aalge), breeding<br>Shag (Phalacrocorax aristotelis), breeding | <br>Favourable Maintained<br>Unfavourable No change<br>Favourable Recovered<br>Favourable Maintained |

18. Ornithological surveys will follow the standard NatureScot guidance. Given the species listed in Table 7.2 are all breeding seabirds then they are all scoped out of further assessment within this report as all construction work will be away from breeding areas. Baseline ornithological field surveys will comprise of the following:

- Breeding Bird Surveys, from April-June.
- If NESBReC and the North East Scotland Raptor Study Group provide confidential information on breeding Schedule 1 raptors and BoCC within a 2km zone of the construction footprint then the following targeted surveys will be required.
- Breeding Raptor and Owl Surveys: 2021 breeding season within the Proposed Development site and with a 2 km buffer, as listed on Annex 1 of the Birds Directive, or Schedule 1 of the Wildlife & Countryside Act 1981 (as amended).

[35] Aberdeenshire Local Development Plan 2017 https://www.aberdeenshire.gov.uk/planning/plans-and-policies/aberdeenshire-local-development-plan-2017/
[36] http://www.nesbrec.org.uk

## 7.7 Mitigation

19. The adoption of embedded mitigation measures to avoid or minimise adverse impacts upon ecological and ornithological features will be part of the iterative design process for the Proposed Development . Measures to avoid or otherwise minimise potentially adverse impacts upon ornithological features during scheme design will include:

- **Land-take** - Development infrastructure will be designed to minimise the requirement for land-take, felling of woodland, the number of watercourse crossings or horizontal directional drilling;
- **Construction Environmental Management Plan** - A Construction Environmental Management Plan (CEMP) will be in place during the construction, operational and decommissioning phases of the development. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the development in line with current guidance.
- **All breeding bird and targeted species surveys** - are only required within the breeding bird season of March-August inclusive. If construction work and vegetation removal take place between September- February inclusive then no breeding bird surveys are required.
- **EcoW** - It would be expected that the ECoW would undertake pre-construction breeding surveys during the appropriate survey months prior to construction.

20. Full details of embedded and site-specific mitigation measures in relation to ornithology will be detailed within the EIA Report.

## 7.8 Reporting

21. The final report will provide commentary across each phase of the development process construction, operation, and decommissioning.

### 7.8.1 Construction Phase

22. During the construction phase of the Proposed Development, in the absence of mitigation, adverse effects upon ornithological features to be addressed within the EIA Report may arise from:

- Habitat loss, fragmentation, severance or change as a result of the delivery and installation of development infrastructure; and
- Disturbance, inadvertent killing or injuring of protected or otherwise notable species or inadvertent damage to their breeding sites or resting places

### 7.8.2 Operational Phase

23. During operation of the Proposed Development, in the absence of mitigation, adverse effects upon ornithological features to be addressed within EIA Report may arise from:

- Disturbance to protected or otherwise notable species as a result of operational activities, such as vehicular traffic and maintenance works; and
- Habitat loss or change, inadvertent killing or injuring of protected or otherwise notable species resulting from the potential spillage and/or mitigation e of pollutants;

### 7.8.3 Decommissioning Phase

24. Potential impacts associated with the decommissioning phase are likely to be similar to those identified for the construction phase.

### 7.8.4 Presentation of sensitive information

25. Ornithological data considered sensitive (e.g. that pertaining to the locations of breeding and/or resting places of protected bird species) will be included in a confidential appendix to the EIA Report. This will not be made publicly available but will be issued to NatureScot.

### 7.8.5 Enhancement

26. Suitable principles for biodiversity enhancement to be delivered as part of the Proposed Development will be outlined within the EIA Report. The appropriateness and feasibility of principles will be confirmed in consultation with NatureScot and relevant consultees, as necessary, over the course of the EIA process.

### 7.8.6 Further Consultation

27. Further consultation with NatureScot is proposed in relation to viewpoints and the scope of ecological baseline information gathering at the earliest convenience.

## 7.9 Questions

- Q7/1: Do consultees agree that the range of ornithological surveys proposed is sufficient and proportionate to inform the design and assessment of the Proposed Development ?
- Q7/2: Do consultees agree that the full range of likely effects to be assessed within the EIA Report has been adequately identified and is proportionate to the nature of the Proposed Development ?
- Q7/3: Are there any other relevant consultees who should be contacted with respect to the ornithology assessment and scope of baseline information gathering?

# 8 Cultural Heritage

## 8.1 Introduction

1. Cultural heritage is represented by a wide range of features, both above and below ground, which result from past human use of the landscape. These can include standing buildings, many of which are still in use; sub-surface archaeological remains and artefact scatters; industrial remains; earthwork monuments and landscape features such as field boundaries. The aim of this study is to identify elements of archaeological and cultural heritage value that may be directly or indirectly impacted upon by the proposed.
2. The following information is presented within this scoping chapter:

- Baseline of known cultural sites within the vicinity of proposed infrastructure; and
- The indirect impact within the proposed area of the substation.

## 8.2 Legislation, Policy and Guidance

### 8.2.1 Legislation

3. National legislation relating to the planning and protection of cultural heritage assets includes:

- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations, Scottish Government, 2017;
- Ancient Monuments and Archaeological Areas Act 1979, UK Government, 1979; and
- Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997, UK Government, 1997; and
- Historic Environment Scotland Act 2014, Scottish Government, 2014.

### 8.2.2 Policy

4. National and local planning policy relating to the Proposed Development site includes:

- National Planning Framework for Scotland 3, Scottish Government, 2014;
- Scottish Planning Policy, 'Valuing the Historic Environment', (pgs.: 33-35), Scottish Government, 2014;
- Historic Environment Policy for Scotland, Historic Environment Scotland, May 2019;
- Planning Advice Note (PAN) 2/2011 – Planning and Archaeology, Scottish Government, 2011;
- Aberdeenshire Local Development Plan Policy HE1 – Protecting Historic Buildings, April 2017;
- *Aberdeenshire Local Development Plan Policy HE2* – Protecting Historic and Cultural Areas, Aberdeenshire Council, April 2017; and
- *Aberdeenshire Local Development Plan Policy C2* – Renewable Energy, Aberdeenshire Council, April 2017.

### 8.2.3 Guidance

5. In addition to the above legislation and policy, a number of guidance documents have been produced relating to the assessment and protection of cultural heritage assets.

- Historic Environment Circular 1, Historic Environment Scotland, June 2016;
- Managing Change in the Historic Environment: Setting, Historic Environment Scotland, June 2016 (updated 2020);

- Designation Policy and Selection Guidance, Historic Environment Scotland, April 2019 (updated 2020);
- Supplementary Guidance Historic Environments 1- Listed Buildings, Aberdeenshire Council, April 2017;
- Supplementary Guidance Historic Environments 2 – Conservation Areas, Aberdeenshire Council, April 2017;
- Supplementary Guidance Historic Environments 3 – Historic Gardens and Designed Landscapes, Aberdeenshire Council, April 2017; and
- Supplementary Guidance Historic Environments 4 – Archeological Sites and Monuments, Aberdeenshire Council, April 2017.

## 8.3 Methodology

6. In the preparation of the assessment, a range of historical and technical data will be collected and analysed. This will include a review of all potential features that fall under the umbrella term of cultural heritage, such as historic buildings and landscapes, in addition to purely archaeological factors. The following sources will be consulted:

- Aberdeenshire Council Archaeology database;
- National Record of the Historic Environment (NRHE);
- Aerial photograph collection held by Historic Environment Scotland (HES);
- National Library of Scotland (Map Library); and
- Historic Environmental Scotland's (HES's) database of; Listed Buildings (LBs), Scheduled Monuments (SMs), Gardens and Designed Landscapes (GDLs), Conservation Areas, Inventory Battlefields, World Heritage Sites and monuments proposed for scheduling.

### 8.3.1 Direct Impact

7. The area most at risk of direct impact will be land within the 500m corridor option and 50m either side of this for each route.
8. Archaeological walkovers will be appropriate for some sections of the route and these will be confirmed with the Aberdeenshire Council Archeologist.

### 8.3.2 Indirect Impact

9. The indirect visual impact on the setting and character of known cultural heritage sites is considered for the four option locations for the substations not the cable routes. The cable will be buried and any indirect impact will be temporary during the construction phase.

### 8.3.3 Cultural Heritage and Archaeology Figures

10. The indirect visual assessment will make use of Zone of Theoretical Visibility (ZTV) maps to highlight areas that the substations are theoretically visible from. This is a 'bare earth' representation which does not take into account local screening from the natural and built environments. Visual representations will be produced when it is considered to be helpful in visualising the potential indirect visual impact of the substation.

### 8.3.4 Historic Maps

11. Historic maps held at the National Library of Scotland (Map Library) and aerial photographs will be consulted online as part of the desk based assessment.

### 8.3.5 Consultation

12. Consultation will be continued with:

- Aberdeenshire Council Archaeology; and
- Historic Environment Scotland.

13. A Scoping Report was previously submitted to Aberdeenshire Council in February 2022 for four proposed cable route options and associated infrastructure under reference ENQ/2022/0373. These routes have since been revised, refined and reduced to two routes. Initial consultee comments are still expected to be relevant to the new routes and these are outlined in Table 8.1 below.

**Table 8.1 – Initial Consultee Comments**

| Consultee | Date | Comments | Actions Taken |
|---|---|---|---|
| Historic Environment Scotland | 18 May 2022 | • Satisfied with the proposed heritage assets to be included within the EIAR.<br>• Welcome the proposed provision of wireframes with the EIA application with relation to the substation and indirect impacts on Scheduled Monuments. | - |
| Aberdeenshire Council Archaeology | 29 March 2022 | • Advise that an element of walk over surveys would be required.<br>• The proposed route would need to be overlaid with the Aberdeenshire HER to advise on any additional features. | • The archaeologist has been contacted and data from the Aberdeenshire HER is included in the baseline.<br>• Walkover surveys will be undertaken in agreement with the Aberdeenshire council archaeologist. |

### 8.3.6 Assessment Criteria

14. The following general criteria outlined in Table 8.2 and Table 8.3 will be used in the assessment of level of effect of any direct or indirect impact on any site of cultural heritage importance.

**Table 8.2 - Sensitivity of cultural heritage and archaeological features**

| Sensitivity | Definition |
|---|---|
| **High** | Category A listed buildings<br>Category B listed buildings<br>Scheduled Monuments<br>Non-statutory List of sites likely to be of national importance<br>Gardens and Designed Landscapes<br>World Heritage Sites<br>Inventory Battlefields |
| **Medium** | Category C listed buildings<br>Archaeological sites on the Sites and Monuments Record (of regional and local importance)<br>Conservation Areas |
| **Low** | Archaeological sites of lesser importance<br>Non-Inventory Gardens and Designed Landscapes |

**Table 8.3 - Magnitude of cultural heritage and archaeological effects**

| Magnitude | Definition |
|---|---|
| **High** | Where development may result in:<br>○ the removal or partial removal of key features, areas or evidence important to the historic character and integrity of the site, which could result in the substantial loss of physical integrity; and/or<br>○ a substantial obstruction of existing view by the addition of uncharacteristic elements dominating the view, significantly altering the quality of the setting or the visual amenity of the site both to and from. |
| **Medium** | Where development may result in:<br>○ the removal of one or more key features, parts of the designated site, or evidence at the secondary or peripheral level, but are not features fundamental to its historic character and integrity; and/or<br>○ a partial obstruction of existing view by the addition of uncharacteristic elements which, although not affecting the key visual and physical relationships, could be an important feature in the views, and significantly alter the quality of the setting or visual amenity of the site both to and from. |
| **Low** | Where development may result in:<br>○ a partial removal/minor loss, and/or alteration to one or more peripheral and/or secondary elements/features, but not significantly affecting the historic integrity of the site or affect the key features of the site; and/or<br>○ an introduction of elements that could be intrusive in views, and could alter to a small degree the quality of the setting or visual amenity of the site both to and from. |
| **Negligible** | Where development may result in:<br>○ a relatively small removal, and/or alteration to small, peripheral and/or unimportant elements/features, but not affect the historic integrity of the site or the quality of the surviving evidence; and/or<br>○ an introduction of elements that could be visible but not intrusive in views, and the overall quality of the setting or visual amenity of the site would not be affected both to and from. |

15. The level of both direct and indirect effects that the Proposed Development may have on the surrounding features of historical significance is determined by the combination of the sensitivity and magnitude of change. The matrix set out in Table 3.1 is used to determine the overall significance of effect.

## 8.4 Baseline

### 8.4.1 Direct Impacts

16. There is potential for features of historical significance within the 500m corridor option and 50m either side of this for each route to be significantly and directly affected by the proposed cable route. The location of the features in relation to the proposed cable routes are shown in figures as provided in Table 8.4. Table 8.5 below lists the features which fall within this study area for each of the four route options.

**Table 8.4 - List of Figures for each route**

| Northern Route | Southern Route |
|---|---|
| Figure 8.1a Cultural Northern Route Section 1 | Figure 8.2a Cultural Southern Route Section 1 |
| Figure 8.1b Cultural Northern Route Section 2 | Figure 8.2b Cultural Southern Route Section 2 |
| Figure 8.1c Cultural Northern Route Section 3 | Figure 8.2c Cultural Southern Route Section 3 |
| Figure 8.1d Cultural Northern Route Section 4 | Figure 8.2d Cultural Southern Route Section 4 |
| Figure 8.1e Cultural Northern Route Section 5 | Figure 8.2e Cultural Southern Route Section 5 |

### Table 8.5 - Historic Features within direct impact study area for routes, joining points and substation options

| Ref | Type of Designation | Monument ID | Name |
|---|---|---|---|
| Northern Cable Route | | | |
| Listed Buildings | | | |
| LB01 | Listed Building | LB19799 | Lunderton House |
| LB02 | Listed Building | LB9421 | Millbank House |
| LB03 | Listed Building | LB9424 | Glenugie Bridge over South Ugie Water |
| LB04 | Listed Building | LB16055 | Brae of Coynach House |
| National Records of The Historic Environment | | | |
| NRHE01 | NRHE | 143816 | Mains of Inverugie |
| NRHE02 | NRHE | 156568 | Lunderton Cottage |
| NRHE03 | NRHE | 159547 | Lunderton |
| NRHE04 | NRHE | 81848 | Saint Fergus and North Ugie Water Canal, Inverquinzie Branch |
| NRHE05 | NRHE | 21151 | Lunderton |
| NRHE06 | NRHE | 81849 | Saint Fergus and North Ugie Water Canal, Inverquinzie Branch, Hallmoss Aqueduct |
| NRHE07 | NRHE | 216364 | Saint Fergus and North Ugie Water Canal, Hallmoss Bridge |
| NRHE08 | NRHE | 156539 | Hallmoss Cottage |
| NRHE09 | NRHE | 216363 | Saint Fergus and North Ugie Water Canal, Hallmoss Basin East |
| NRHE10 | NRHE | 216300 | Saint Fergus and North Ugie Water Canal, Hollmoss Basin |
| NRHE11 | NRHE | 81846 | Saint Fergus and North Ugie Water Canal, Peterhead Line |
| NRHE12 | NRHE | 143696 | Cairnhill |
| NRHE13 | NRHE | 216299 | Saint Fergus and Noth Ugie Water Canal, Stone Mills Corn Mill Bridge |
| NRHE14 | NRHE | 143694 | Stone Mills |
| NRHE15 | NRHE | 134485 | River Ugie |
| NRHE16 | NRHE | 143702 | River Ugie |
| NRHE17 | NRHE | 320391 | St Fergus and Peterhead 132kV Line |
| NRHE18 | NRHE | 186905 | Rora |
| NRHE19 | NRHE | 143686 | Millbank |
| NRHE20 | NRHE | 143684 | Millbank |
| NRHE21 | NRHE | 21021 | Auchlee |
| NRHE22 | NRHE | 128946 | Woodside |
| NRHE23 | NRHE | 156536 | Moss of Auchlee |

| Ref | Type of Designation | Monument ID | Name |
|---|---|---|---|
| NRHE24 | NRHE | 284404 | Inverquhomery |
| NRHE25 | NRHE | 346349 | Mill-Croft |
| NRHE26 | NRHE | 21078 | Denvale |
| NRHE27 | NRHE | 21067 | Denvale |
| NRHE28 | NRHE | 264918 | Mill of Clola |
| NRHE29 | NRHE | 264850 | Clola |
| NRHE30 | NRHE | 264798 | North Auchtylair |
| NRHE31 | NRHE | 264915 | Skelmuir Cottages |
| NRHE32 | NRHE | 264851 | Skelmuir Cottages |
| NRHE33 | NRHE | 167024 | South Auchtylair |
| NRHE34 | NRHE | 167672 | Kinnadie |
| NRHE35 | NRHE | 264901 | Kinnadie Cottage |
| NRHE36 | NRHE | 167665 | Upper Kinnadie |
| NRHE37 | NRHE | 167021 | Tollybrae |
| NRHE38 | NRHE | 264804 | Skipleton |
| NRHE39 | NRHE | 264879 | Bogiesavoch |
| NRHE40 | NRHE | 264877 | Slampton |
| NRHE41 | NRHE | 20668 | Hogshillock |
| NRHE42 | NRHE | 339875 | Clochan School House, War Memorial |
| NRHE43 | NRHE | 167438 | Lambshillock |
| NRHE44 | NRHE | 20685 | Lambshillock |
| NRHE45 | NRHE | 20630 | Bulwark Moss |
| NRHE46 | NRHE | 76888 | Auchreddie |
| NRHE47 | NRHE | 346348 | Mill of Inverquhomery |
| Aberdeenshire Historic Environment Records | | | |
| HER01 | Aberdeenshire HER | NK14NW0076 | Mains of Inverugie |
| HER02 | Aberdeenshire HER | NK14NW0404 | Lunderton |
| HER03 | Aberdeenshire HER | NK14NW0086 | Lunderton |
| HER04 | Aberdeenshire HER | NK14NW0001 | Lunderton Farm |
| HER05 | Aberdeenshire HER | NK14NW0031 | Lunderton |
| HER06 | Aberdeenshire HER | NK14NW0596 | Hallmoss Bridge |
| HER07 | Aberdeenshire HER | NK04NE0117 | Hallmoss Cottage |
| HER08 | Aberdeenshire HER | NK04NE0025 | Ugie Canal |
| HER09 | Aberdeenshire HER | NK04NE0030 | Cairnhill |
| HER10 | Aberdeenshire HER | NK04NE0038 | Stonemills |
| HER11 | Aberdeenshire HER | NK04NE0029 | Stonemills |
| HER12 | Aberdeenshire HER | NK04NE0083 | St Fergus Pipelime |

| Ref | Type of Designation | Monument ID | Name |
|---|---|---|---|
| HER13 | Aberdeenshire HER | NK04NE0104 | Newseat |
| HER14 | Aberdeenshire HER | NK04NE0076 | Middleton of Rora |
| HER15 | Aberdeenshire HER | NK04NW0057 | Drums |
| HER16 | Aberdeenshire HER | NK04NW0026 | Gallows Hill |
| HER17 | Aberdeenshire HER | NK04NW0071 | Gallows Hill |
| HER18 | Aberdeenshire HER | NK04NW0073 | Gallows Hill |
| HER19 | Aberdeenshire HER | NK04NW0072 | Gallows Hill |
| HER20 | Aberdeenshire HER | NK04NW0067 | Heatheryfauld |
| HER21 | Aberdeenshire HER | NK04NW0075 | Inverquhomery |
| HER23 | Aberdeenshire HER | NJ94SE0085 | Kinnadie |
| HER24 | Aberdeenshire HER | NJ94SE0054 | Kinaldie |
| HER25 | Aberdeenshire HER | NJ94SE0110 | Upper Kinnadie, Auchnagatt |
| HER26 | Aberdeenshire HER | NJ94SE0039 | Skipleton |
| HER27 | Aberdeenshire HER | NJ94SE0039 | Skipleton |
| HER28 | Aberdeenshire HER | NJ94SE0086 | Bogiesavoch |
| HER29 | Aberdeenshire HER | NJ94SW0101 | Clochan School War Memorial |
| HER30 | Aberdeenshire HER | NJ94SW0054 | Clochan |
| HER31 | Aberdeenshire HER | NJ94SW0053 | Clochan |
| HER32 | Aberdeenshire HER | NJ94SW0094 | Nethermuir House |
| HER33 | Aberdeenshire HER | NJ94NW0094 | Badnyrieves |
| HER34 | Aberdeenshire HER | NJ94SW0070 | Badnyrieves |
| HER35 | Aberdeenshire HER | NJ84SE0065 | Auchmallidie |
| HER36 | Aberdeenshire HER | NJ84NE0081 | Auchmaliddie |
| HER37 | Aberdeenshire HER | NJ84NE0082 | Easter Auchmaliddie |
| HER38 | Aberdeenshire HER | NJ84NE0060 | Mitchellhill Cottage |
| HER39 | Aberdeenshire HER | NJ84SW0089 | Upper Mains of Asleid |
| HER40 | Aberdeenshire HER | NJ84SW0090 | Silverlea |
| HER41 | Aberdeenshire HER | NJ84SW0067 | Faddon Hill |
| HER42 | Aberdeenshire HER | NK04NW0063 | Greenhill |
| NER43 | Aberdeenshire HER | NK04NW0064 | Greenhill |
| Southern Cable Route | | | |
| Listed Buildings | | | |
| LB01 | Listed Building | LB16055 | Brae of Coynach House |
| National Records of the Historic Environment | | | |
| NRHE01 | NRHE | 75962 | Heathery Haven, Salmon House |
| NRHE02 | NRHE | 156556 | Den Muir |
| NRHE03 | NRHE | 156554 | Burnhead |

| Ref | Type of Designation | Monument ID | Name |
|---|---|---|---|
| NRHE04 | NRHE | 156552 | Hill of Longhaven |
| NRHE05 | NRHE | 161830 | Hill of Long Haven, Radio Station |
| NRHE06 | NRHE | 156553 | Hill of Long Haven |
| NRHE07 | NRHE | 77131 | 'The Lady of Craig's Place' |
| NRHE08 | NRHE | 143729 | Nether Savock |
| NRHE09 | NRHE | 143716 | Braeside |
| NRHE10 | NRHE | 77096 | Ludquharn Castle |
| NRHE11 | NRHE | 143718 | Newton of Ludquharn |
| NRHE12 | NRHE | 143717 | Oldmill |
| NRHE13 | NRHE | 21082 | Mill Hill |
| NRHE14 | NRHE | 21079 | Mill Hill |
| NRHE15 | NRHE | 21078 | Denvale |
| NRHE16 | NRHE | 21067 | Denvale |
| NRHE17 | NRHE | 264918 | Mill of Clola |
| NRHE18 | NRHE | 264850 | Clola |
| NRHE19 | NRHE | 20672 | Shannas |
| NRHE20 | NRHE | 264854 | Brae of Coynach, Mill Ponds |
| NRHE21 | NRHE | 264798 | North Auchtylair |
| NRHE22 | NRHE | 264915 | Skelmuir Cottages |
| NRHE23 | NRHE | 264851 | Skelmuir Cottage |
| NRHE24 | NRHE | 167024 | South Auchtylair |
| NRHE25 | NRHE | 167672 | Kinnadie |
| NRHE26 | NRHE | 264901 | Kinnadie Cottage |
| NRHE27 | NRHE | 167665 | Upper Kinnadie |
| NRHE28 | NRHE | 167021 | Tollybrae |
| NRHE29 | NRHE | 264804 | Skipleton |
| NRHE30 | NRHE | 264879 | Bogiesavoch |
| NRHE31 | NRHE | 264877 | Slapmton |
| NRHE32 | NRHE | 20668 | Hogshillock |
| NRHE33 | NRHE | 339875 | Clochan School House, War Memorial |
| NRHE34 | NRHE | 167438 | Lambshillock |
| NRHE35 | NRHE | 20685 | Lambshillock |
| NRHE36 | NRHE | 20630 | Bulwark Moss |
| NRHE37 | NRHE | 76888 | Auchreddie |
| Aberdeenshire Historic Environment Record | | | |
| HER01 | Aberdeenshire HER | NK14SW0015 | Long Haven Quarry |
| HER02 | Aberdeenshire HER | NK14SW0109 | Fiery Cross, Long Haven, Buchan Ness |

| Ref | Type of Designation | Monument ID | Name |
|---|---|---|---|
| HER03 | Aberdeenshire HER | NK14SW0119 | Augusta, Long Haven, Buchan Ness |
| HER04 | Aberdeenshire HER | NK13NW0034 | Station Farm |
| HER05 | Aberdeenshire HER | NK04SE0092 | Nether Savock |
| HER06 | Aberdeenshire HER | NK04SW0027 | Braeside |
| HER06 | Aberdeenshire HER | NK04SW0057 | Kinmundy |
| HER07 | Aberdeenshire HER | NK04SW0062 | Millhill |
| HER08 | Aberdeenshire HER | NK04SW0064 | Millhill |
| HER09 | Aberdeenshire HER | NK04SW0061 | Millhill |
| HER10 | Aberdeenshire HER | NK04SW0060 | Millhill |
| HER11 | Aberdeenshire HER | NK04SW0059 | Millhill |
| HER12 | Aberdeenshire HER | NK04SW0063 | Millhill |
| HER13 | Aberdeenshire HER | NK04NW0067 | Heathryfauld |
| HER14 | Aberdeenshire HER | NK04NW0079 | Millhill |
| HER15 | Aberdeenshire HER | NJ94SE0085 | Kinnadie |
| HER16 | Aberdeenshire HER | NJ94SE0054 | Kinaldie |
| HER17 | Aberdeenshire HER | NJ94SE0110 | Upper Kinnadie, Auchnagatt |
| HER18 | Aberdeenshire HER | NJ94SE0039 | Skipleton |
| HER19 | Aberdeenshire HER | NJ94SE0039 | Skipleton |
| HER20 | Aberdeenshire HER | NJ94SE0086 | Bogiesavoch |
| HER21 | Aberdeenshire HER | NJ94SW0101 | Clochan School War Memorial |
| HER22 | Aberdeenshire HER | NJ94SW0054 | Clochan |
| HER23 | Aberdeenshire HER | NJ94SW0053 | Clochan |
| HER24 | Aberdeenshire HER | NJ94SW0094 | Nethermuir House |
| HER25 | Aberdeenshire HER | NJ94NW0094 | Badnyrieves |
| HER26 | Aberdeenshire HER | NJ94SW0070 | Badnyrieves |
| HER27 | Aberdeenshire HER | NJ84SE0065 | Auchmaliddie |
| HER28 | Aberdeenshire HER | NJ84NE0081 | Auchmaliddie |
| HER29 | Aberdeenshire HER | NJ84NE0082 | Easter Auchmaliddie |
| HER30 | Aberdeenshire HER | NJ84NE0060 | Mitchellhill Cottage |
| HER31 | Aberdeenshire HER | NJ84SW0089 | Uppermains of Asleid |
| HER32 | Aberdeenshire HER | NJ84SW0090 | Silverlea |
| HER33 | Aberdeenshire HER | NJ84SW0067 | Faddon Hill |

17. An assessment of the direct impact on these features will be carried out and used to inform the design. If any of the above features are close to the final layout, they will be fenced off to avoid accidental damage during the construction phase.

### 8.4.2 Indirect Impacts

18. Figure 8.3 show the theoretical visibility of the proposed substation location. Regionally significant historical features out to 2km such as 'B' Listed Buildings and conservation areas have been considered; while nationally significant features such as A' Listed Buildings, Scheduled Monuments, Gardens and Designed Landscapes, Inventory Battlefields and World Heritage Sites have been considered out to 5km.Table 8.6 below lists these historical features found within the 5km (2km for 'B' listed buildings) study radius.

**Table 8.6 - Historical Features within 5km ('B' listed to 2km)**

| Ref | Schedule/LB Ref | Name | Description | Within ZTV |
|---|---|---|---|---|
| **LB01 (B)** | LB9629 | Milbrex Church | Church 1881-12, rectangular plan. Original furnishings, no features of special note. | Yes |
| **LB02 (B)** | LB16160 | Cairnbanno House | Late 18th century, 2 storey granite rubble. Now farmhouse. | Yes |
| **SM01** | SM8229 | Gight Castle, dovecot | The monument comprises the remains of a dovecot associated with Gight Castle. The dovecot stands in woodland on the north edge of the Ythan Gorge. | No |
| **SM02** | SM2508 | Gight Castle | Remains of Gight (or Formantine) Castle and associated features. | No |
| **SM03** | SM9392 | North Mains of Auchmaliddie, stone circle | Remains of recumbent stone circle situated on op of a low hill. 2 surviving stones. | Yes |

## 8.5 Potential Effects

19. Historic assets will be avoided wherever possible as part of the design process. Two Scheduled Monuments, Gight Castle (SM2508) and Gight Castle dovecot (SM8229) found within the study area, lie outwith the ZTV and will be scoped out of the final assessment. The remaining three cultural sites, Milbrex Church, Cairnbanno House (both 'B' listed buildings) and one scheduled monument, the stone circle at North Mains of Auchmaliddie will be taken forward in the assessment. They will be assessed as part of the planning submission for the cable route and will be accompanied by wirelines and/or photomontages where appropriate.

## 8.6 Mitigation

20. Planning guidance (SPP – Historic Environment) states that it is Government policy to protect and preserve archaeological sites and monuments in situ wherever feasible. Where preservation in situ is not possible planning authorities should ensure that an appropriate level of excavation, recording, analysis, publication and archiving is carried out, before and/or during development. If deemed appropriate a Programme of Archaeological Works including an Archaeological Watching Brief may be required during ground breaking works associated with the construction phase.

### 8.6.1 Operation – Permanent Land Affected

21. Current proposals indicate that it will be possible to avoid the known features of cultural heritage interest that are currently present, and as such direct impacts should be avoided. However, a detailed assessment and site walkover of the preferred cable route will be carried out. This baseline was prepared using data from Historic

Environments Scotland, however, it is nevertheless possible that additional, unrecorded features do exist within the potential cable route area. In the event that archaeological features are encountered, a suitable program of archaeological works will be implemented to the satisfaction of the planning authority.

### 8.6.2 Restoration

22. It is not anticipated that any restoration measures are required. However, if required it will be agreed with the planning authority.

## 8.7 Summary

23. The Proposed Development is unlikely to give rise to significant effects in terms of indirect impacts on the setting of features of cultural heritage during the construction and operational phase. While the current baseline suggests that direct impact during the construction phase can be avoided.

## 8.8 Key Questions for Council and Consultees

- Q8/1: Do the Council and consultees agree with the proposed methodology and scope of assessment?
- Q8/2: Do the Council and consultees know of any cultural heritage assets in the vicinity of the development which it considers may raise significant issues with the EIA process?
- Q8/3: Do the Council and consultees know of any cultural heritage assets which have not been included within the assessment scope that require inclusion in the final scope?
- Q8/4: We understand that walk overs may be required for some sections of the route, do the Council and consultees have any key areas where these should occur?

# 9 Geology, Hydrology, Hydrogeology and Soils

## 9.1 Introduction

1. This assessment will present the impact of potential effects of the construction and operation of the Proposed Development on geology, hydrology and hydrogeology.
2. Understanding surface and groundwater environments is critically important to designing a successful project. Surface water includes watercourses, water bodies, and precipitation runoff. It provides an important resource for: potable and other uses; amenity; aesthetic value; conservation; ecological environments; and for recharge to groundwater systems. Groundwater is also an important resource. It proves more than a third of the potable water supply in the UK and includes all water stored in permeable underground strata (or aquifers). In addition, it provides essential baseflow to rivers and wetland areas, often supporting important ecological systems.

## 9.2 Policy and Legislation

3. Guidance for assessing the potential impact of the Proposed Development on the hydrological and hydrogeological features of the development study area will be based on the following statutory and general and national guidance. Any appropriate local policy and guidance will also be considered.

**Table 9.1 - Policy, Legislation & Guidance**

| | |
|---|---|
| **SEPA Guidance Documents** | PPG 1 General Guide to the Prevention of Pollution.<br>GPP 2 Above Ground Oil Storage Tanks.<br>PPG 3 Use and design of oil separators in surface water drainage systems.<br>GPP 4 Treatment and disposal of wastewater where there is no connection to the public foul sewer.<br>GPP 5 Works and maintenance in or near water.<br>PPG 6 Working at Construction and Demolition Sites.<br>GPP 8 Safe Storage and Disposal of Used Oils.<br>GPP 21 Pollution Incident Response Planning.<br>Managing River Habitats for Fisheries, 2002.<br>Special Requirements for Civil Engineering Contracts for the Prevention of Pollution, Version 2, SEPA, 2006.<br>Culverting of Watercourses, WAT-PS-06-02, 2015.<br>Natural Flood Management Handbook, 2015.<br>Indicative River & Coastal Flood Map (Scotland).<br>Planning advice on waste water drainage, 2011.<br>Temporary Construction Methods, WAT-SG-29, 2009.<br>SEPA Flood Risk and Planning Briefing Note, 2009.<br>Groundwater Protection Policy for Scotland, v3, 2009.<br>SEPA Position Statement 'The role of SEPA in Natural Flood Management', 2012.<br>Technical flood risk guidance for stakeholders, SS-NFR-P-002, 2015.<br>SEPA Regulatory Position Statement – Developments on peat, 2010.<br>Engineering in the water environment: good practice guide; River crossings, 2010.<br>Environmental Standards for River Morphology, WAT-SG-21, 2012. |

| | |
|---|---|
| | The Water Environment (Controlled Activities) (Scotland) Regulations 2011; A practical guide, Version 8.3 February 2019.<br>Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems, 2017.<br>Land Use Planning System SEPA Guidance Note 4: Planning guidance on on-shore windfarm developments, 2017.<br>SEPA Water quality classification interactive database (2019 data). |
| **Other Guidance Documents** | CIRIA C515 Groundwater Control - Design and Practice.<br>CIRIA C532 Control of Water Pollution from Construction Sites.<br>CIRIA C648 Control of Water Pollution from Linear Construction Projects.<br>CIRIA C689 Culvert Design and Operation Guide.<br>CIRIA C741 Environmental Good Practice on Site.<br>CIRIA C753 SUDS Manual<br>A handbook on environmental impact assessment; Guidance for Competent Authorities, Consultees and others involved in the Environmental Impact Assessment Process in Scotland. NatureScot, 2018.<br>River Crossings and Migratory Fish: Design Guidance, A Consultation Paper, The Scottish Executive.<br>Good Practice During Windfarm Construction, 2019 (4th Edition), Scottish Renewables (SR), NatureScot, SEPA, Forestry Commission Scotland (FCS), Historic Environment Scotland and Marine Scotland Science.<br>Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only.<br>Forestry & Water Scotland (2018) Protecting Private Water Supplies During Forestry Activities, |
| **Scottish Government Policy, Advice and Legislation Documents** | The Housing Scotland (Act) 1987 (Sect 86).<br>PAN 79: Water and Drainage, 2006.<br>Planning Advice Note (PAN) 61: Planning and SUDS, 2001.<br>Scottish Government (2017) Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity Generation Developments.<br>Scottish Planning Policy (SPP) 2014.<br>Water Environment and Water Services (Scotland) Act 2003.<br>The Flood Risk Management (Scotland) Act 2009<br>The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations, 2017.<br>The Public and Private Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2017.<br>The Pollution Prevention and Control (Scotland) Regulations, 2000. |
| **Retained European Legislation** | Freshwater Fish Directive 2006/44/EC.<br>Water Framework Directive (WFD) 2000/60/EC.<br>Dangerous Substances Directive 76/464/EEC. |

## 9.3 Method of Assessment and Reporting

4. The assessment of the potential impact of the proposal on hydrology and hydrogeology was carried out by the general method described in the following sections.

### 9.3.1 Determination of Study Area

5. It is expected that a working corridor of approximately 500m will be required for the proposed cable routes. A study area of 250m was established around the proposed landing points and the proposed working corridor for the cable routes, and a 1km study area was positioned around the proposed substation location.

### 9.3.2 Desk Study Assessment Methodology

6. It is important to initially establish the baseline conditions so that an accurate hydrological context map can be developed for the study area.
7. The baseline will identify any features that have the potential to be impacted by the proposed onshore development (**Figures 9.1** and **9.2**). This can then be used to inform the final cable route and substation design. The study area will be reviewed and amended in response to refinement of design options and the identification of additional impact pathways, and in response to feedback from scoping consultation. The following sources of information will be consulted as part of the desk study:

- Draft layout including all associated infrastructure;
- Surface and groundwater information, including local water quality and any relevant groundwater level data, will be obtained from SEPA;
- Ground conditions will be initially determined using published geology maps and site-specific geology information will be obtained from the British Geological Survey (BGS);
- Hydrogeological information will be obtained from the BGS;
- Information relating to private water supplies will be obtained from the Environmental Health Officer at Aberdeenshire Council;
- Public water supply information and infrastructure will be obtained from Scottish Water; and
- NatureScot's Carbon and Peatland 2016 mapping.

8. The desk study will also include a review of relevant historical maps, soil maps and aerial photographs.

### 9.3.3 Field Survey Methodology

9. Following the desk study and initial concept of the study area, a targeted site walkover be undertaken across the study area and the following actions carried out:

- Verification of any information collected during the desk study;
- Discussions with residents served by the private water supplies within the route corridor to confirm the source and type of water supply, where possible;
- Photographic evidence of the required watercourse crossing points of named watercourses;
- Establishment of a first-hand understanding of the study area, including watercourses and ground conditions, to assess the relative location of all the components of the Proposed Development; and
- Identification of any potential constraints to the Proposed Development from the topography and ground conditions.

10. A National Vegetation Classification (NVC) survey for the study area will be used to screen for the potential presence of Ground Water Dependent Terrestrial Ecosystems (GWDTEs). Areas of potential High and Moderate GWDTE will be investigated to assess whether they are sustained by groundwater as part of the field work.

### 9.3.4 Consultation

11. Consultation will be carried out and continued with:

    - SEPA;
    - NatureScot;
    - River Ythan Trust;

- Ugie River Salmon Fishery Board;
- Peterhead Port Authority;
- Aberdeenshire Council; and
- Scottish Water.

12. A Scoping Exercise was previously undertaken for four proposed cable routes and associated onshore infrastructure for Green Volt Offshore Windfarm (ENQ/2022/0373).
13. This route has since been revised and reduced to two proposed routes however, some of the initial advice from Consultees is expected to still be relevant for the nature of the development. The consultations that are relevant to this assessment are listed in Table 9.2 below:

**Table 9.2 – Initial Consultee Comments**

| Consultee | Date | Comments |
|---|---|---|
| SEPA | 18 March 2022 | • Welcomed the proposed constructional technique of Horizontal Directional Drilling for laying the cable below watercourses and sensitive habitats.<br>• Note that flood risk may not be an impact if watercourse crossings can be designed to accommodate the 1 in 200-year flood event and other infrastructure is sited at an appropriate distance from watercourses.<br>• Welcome the inclusion of Private Water Supplies (PWS) and a targeted NVC survey in the baseline, and the submission of a Construction Method Statement.<br>• Request a map illustrating all proposed temporary or permanent infrastructure overlain with all lochs and watercourses. If any of the proposed infrastructure breach the proposed 15m buffer around any waterbodies, each breach should be numbered on a plan with a photographed location, dimensions of the waterbody, and drawings of the proposed engineering works<br>• Requested a detailed layout of all proposed mitigation, including any proposed drainage strategies.<br>• The assessment must demonstrate how the final layout has been designed to minimise any unnecessary disturbance of peatland must outline any proposed preventative/mitigation measures. Depending on the baseline information, the applicant must then decide whether a full Peat Management Plan (PMP) is required.<br>• Requested a map illustrating that all GWDTE are situated outwith the relevant Zones of Dewatering for any required excavations. If the required buffers cannot be achieved, then a detailed site specific qualitative and/or quantitative risk assessment will be required.<br>• Require a map detailing any existing groundwater abstractions within 100m of all excavations shallower than 1m and outwith 250m of all excavations deeper than 1m and proposed groundwater abstractions. If these buffers cannot be achieved, then detailed site specific qualitative and/or quantitative risk assessment will be required. |

| | | |
|---|---|---|
| | | • Require the submission of a schedule of mitigation, which includes site-specific maps and plans, and is in line with best practice pollution prevention and construction techniques. |
| Flood Risk and Coast Protection | 29 March 2022 | • Advise that SEPA's River Crossing guidance if followed, regarding the final number of watercourse crossings.<br>• Note that a Flood Risk Assessment (FRA) may be required, depending on the final design.<br>• Request that a Drainage Impact Assessment (DIA) is submitted alongside the application. |

### 9.3.5 Assessment Criteria

14. The criteria set out in the Tables below will be used in the assessment of any potential effects of the Proposed Development on geology, hydrology, and hydrogeology. With the baseline established, sensitive receptors can be determined. Table 9.3 outlines the various factors considered when assessing the sensitivity of a variety of receptors.

**Table 9.3 – Sensitivity Table**

| Sensitivity | Definition |
|---|---|
| High | Receptor of high quality, rarity of a regional or national scale, and limited potential for substitution or replacement. This Includes:<br>• Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA) or Special Area of Conservation (SAC);<br>• SEPA Water Quality defined as High;<br>• Abstraction for public;<br>• Private water supplies – 0 to 100m from construction activities;<br>• Designated salmonid fishery and/or salmonid spawning grounds present;<br>• Watercourse widely used for recreation, directly related to watercourse quality (e.g. swimming, salmon fishery) <1.2km downstream of development;<br>• Active flood plain area (important in relation to flood defence);<br>• Groundwater - public drinking water supply;<br>• Groundwater aquifer productivity classed 1A or 2A in the BGS 1:625000 Hydrogeology Map;<br>• Geology that is rare or of national importance as defined by SSSI or Regional Important Geological Site (RIGS);<br>• Groundwater dependent terrestrial ecosystems (GWDTE) defined as Class 1; and<br>• Peat Slide Risk likelihood of 'probable' or 'almost certain'. |
| Medium | Receptor of medium quality, rarity of a local scale, and limited potential for substitution/replacement. Or a receptor of medium quality and rarity of regional or national scale, and limited potential for substitution/replacement. This includes:<br>• SEPA Water Quality defined as Good;<br>• Surface water abstractions for private water supply for more than fifteen people;<br>• Private Water Supplies – Surface water abstractions within 100–600m of construction activities, groundwater spring abstractions within 100–400m of construction activities, and groundwater borehole abstractions within 0– 200m of construction activities; |

| | |
|---|---|
| | • Designated salmonid fishery and/or cyprinid fishery;<br>• Watercourse widely used for recreation, directly related to watercourse quality (e.g. swimming, salmon fishery) >1.2km downstream of development;<br>• Groundwater aquifer productivity classed as 1B or 2B in the BGS 1:625000 Hydrogeology Map;<br>• Groundwater dependent terrestrial ecosystems (GWDTE) defined as Class 2, and/or defined as 'Medium Conservation Value' by Ecologist; and<br>• Peat Slide Risk of 'Likely'. |
| Low | Receptor of low quality, rarity of a local scale, and limited potential for substitution/replacement. Or a receptor of low quality, rarity of a regional or national scale, and limited potential for substitution/replacement. This includes:<br>• SEPA Water Quality defined as Moderate or Poor;<br>• Occasional or local recreation (e.g. local angling clubs);<br>• Conveyance of flow and material, main river <10 m wide or ordinary watercourse >5 m wide;<br>• Existing flood defences;<br>• Private Water Supplies – Surface water abstractions >600m from construction activities, groundwater spring abstractions within 400–800m of construction activities, and groundwater borehole abstractions within 200–600 m of construction activities;<br>• May be subject to improvement plans by SEPA;<br>• Designated cyprinid fishery, salmonid species may be present and catchment locally important for fisheries;<br>• Watercourse not widely used for recreation, or recreation use not directly related to watercourse quality;<br>• Groundwater aquifer productivity classed as 1C or 2C in the BGS 1:625000 Hydrogeology Map; and<br>• Groundwater dependent terrestrial ecosystems (GWDTE) defined as Class 3, and/or defined as 'Local Conservation Importance' by Ecologist;<br>• Peat Slide Risk of 'Unlikely'. |
| Negligible | Receptor of low quality, rarity of a local scale, and limited potential for substitution/replacement. Environmental equilibrium is stable and is resilient to changes that are greater than natural fluctuations, without detriment to its present character. This includes:<br>• SEPA water quality defined as Bad;<br>• Fish sporadically present or restricted, no designated features;<br>• Receptors not used for recreation, e.g. no clubs or access route associated with watercourse;<br>• Watercourse <5 m wide – flow conveyance capacity of watercourse low - very limited floodplain as defined by topography, historical information and SEPA flood map;<br>• Private Water Supplies – groundwater spring abstraction >800 m from construction activities, and groundwater borehole abstractions >600 m from construction activities;<br>• No public drinking water supplies;<br>• Groundwater aquifer productivity classed as 3 in the BGS 1:625000 Hydrogeology Map;<br>• Receptor heavily engineered or artificially modified and may dry up during summer months;<br>• Geology not designated under a SSSI or RIGS or protected by specific guidance;<br>• Peat Slide Risk of 'Negligible'. |

15. The significance of each impact on a receptor is based on its magnitude. The magnitude of impact includes the timing, scale, size, and duration of the potential impact. For the purposes of this assessment the magnitude criteria are defined in Table 9.4.

**Table 9.4 - Magnitude of Impact Table**

| Magnitude | Criteria | Description and Example |
|---|---|---|
| Large | Results in loss of attribute | • Fundamental (long term or permanent) changes to geology, hydrology, water quality and hydrogeology;<br>• Loss of designated Salmonid Fishery;<br>• Loss of national level designated species/habitats;<br>• Changes in WFD water quality status of river reach;<br>• Loss flood storage/increased flood risk;<br>• Pollution of potable source of abstraction compared to pre-development conditions. |
| Medium | Results in impact on integrity of attribute or loss of part of attribute | • Material but non-fundamental and short to medium term changes to the geology, hydrology, water quality and hydrogeology;<br>• Loss in productivity of a fishery;<br>• Contribution of a significant proportion of the discharges in the receiving water, but insignificant enough to change its water quality status; |
| Small | Results in minor impact on attribute | • Detectable but non-material and transitory changes to the geology, hydrology, water quality and hydrogeology; |
| Negligible | Results in an impact on attribute but of insufficient magnitude to affect the use/integrity | • No perceptible changes to the geology, hydrology, water quality and hydrogeology;<br>• Discharges to watercourse but no loss in quality, fishery productivity or biodiversity;<br>• No significant impact on the economic value of the receptor; and<br>• No increase in flood risk. |

16. The sensitivity of the receptor together with the magnitude of impact defines the significance of the impact as outlined below in Table 9.5.

**Table 9.5 - Significance of Impact Matrix**

| Sensitivity | Magnitude | | | |
|---|---|---|---|---|
| | Large | Medium | Small | Negligible |
| High | Major | Major | Moderate | Negligible |
| Medium | Major | Moderate | Minor | Negligible |
| Low | Moderate | Minor | Minor | Negligible |
| Negligible | Negligible | Negligible | Negligible | Negligible |

17. Where the significance of an impact is defined to be minor, moderate, or major - mitigation is required to reduce those impacts to be non-significant.

## 9.4 Preliminary Baseline

### 9.4.1 Preliminary Baseline Conditions

18. To facilitate the connection of the proposed wind farm to the national grid, a new buried cable will be required to connect the landing point to a new substation at New Deer, Aberdeenshire. The onshore options for the Proposed Development are discussed in further detail within **Section 2.4 – the Proposed Development.**

19. The preferred working corridor for the cable route and associated infrastructure will run for approximately 33km from its onshore arrival point at the Southern Landing Point near Boddam or the Northern Landing Point to the north of St Fergus, to the indicative substation location near New Deer (**see Figures 9.1** and **9.2**). The study area covers a 250m buffer zone around the proposed working corridor options.

20. The land use within the study area is dominated by agriculture, predominantly crossing through arable land and agriculturally improved grassland however, there are also some small patches of woodland, watercourses including the River Ugie, and roads. There are no sizeable towns within the study area although there are several scattered residential properties, farms, and small settlements.

21. The topography of the study area predominantly consists of gently undulating hills that range from approximately 20-150m AOD. The land falls to the east of the study area to form the coastal cliffs and dunes near St Fergus, and the sandy beach at Sandford Bay.

### 9.4.2 Geology

22. The British Geological Survey (BGS) 1:50,000 map[37] indicates that the eastern region of the study area is predominantly underlain with Crinan subgroup and Tayvallich subgroup that are formed of semipelite, pelite and psammite rocks that were sedimentary in origin but have subsequently undergone metamorphism. This bedrock is occasionally intersected by areas of Forest of Deer Pluton Melagranite, biotite igneous bedrock, Forest of Deer Pluton – Diorite bedrock, metamorphic bedrock of the Collieston Formation, and igneous bedrock of the north-east Grampian Granitic Suite. Further toward the coastline, the eastern region of the study area is mostly underlain by Peterhead Pluton - Granite.

23. Metagreywacke is predominant throughout the western region of the study area and is comprised of interbedded psammite and semipelite with subsidiary pelite of the Macduff Formation. This bedrock is divided by Maud Pluton - Gabbroic-rock of the North-East Grampian Basic Suite. Along the western study area, there is also a pocket of foliated-biotite metamelagranite that forms the North-East Grampian Granitic Suite, a linear section of Quartz-microgabbro of the North Britain Late Carboniferous Tholeiitic Suite, and a small area of Porphyritic felsite which forms part of the North Britain Siluro-devonian Calc-alkaline Dyke Suite.

24. The superficial geology information within the study area was obtained from the 1:50,000 BGS mapping. The Banchory Till Formation is the most predominant superficial deposit within the study area. This gravelly and sandy diamicton is primarily composed of Neoproterozoic metamorphic rocks and Caledonian igneous rocks.

25. Alluvium deposits were identified at various locations within the study area, comprising silt, clay, sand, and gravel. In general, these deposits are located following or adjacent to a watercourse. Several outcrops of Glaciofluvial Sheet Deposits were identified within the study area. These superficial deposits are commonly formed of sand, gravel, silt, clay, or organic material. An parcel of head deposit was identified within the eastern region of the study area, which is a polymict deposit and is described as comprising gravel, sand, and

[37] https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/ (Last Accessed: 24/10/2022)

clay, depending on the upslope source and the distance from the source. This head deposit is intersected by isolated pockets of peat, alluvium, and Glaciofluvial Ice Contact Deposits, which consists of stratified sand, gravel and interbedded diamicton deposited by meltwater and ice glaciers. Diamicton, clay, sand and gravel deposits of the Hatton Till formation become dominant towards the east of the study area, with some smaller areas of blown sand and marine beach deposits confined to the coastline.

### 9.4.3 Soil and Peatland

26. The National Soil Map of Scotland identified the main soil type within the study area as mineral gleys, mineral podzols, and brown soils, as shown in **Figure 9.3**[38]. The centre of the study area is dominated by brown soils, whilst the mineral gleys become more prevalent towards the coastline. There are also smaller pockets of alluvial soils, immature soils, peat, peaty gleys, and peaty podzols encompassed within the study area.
27. A review of the Carbon and Peatland Map 2016[39] identified several isolated pockets of Class 1 peat throughout the study area, although in greater concentration within the southeastern region as shown in **Figures 9.1** and **9.2**. Class 1 peats are nationally important carbon-rich soils that are likely to be of high conservation value.
28. The study area is mostly underlain with mineral soils (no peatland vegetation), however there are also some small pockets of Class 3 peat (predominantly peaty soil with some peat soil), Class 4 peat (Predominantly mineral soil with some peat soil), and some areas of Class 5 peat (no peatland vegetation) which is primarily located adjacent to the Class 1 peatland.

### 9.4.4 Hydrogeology

29. The BGS Aquifer Classification Dataset for Scotland classifies the potential for bedrock to supply groundwater and describes the potential groundwater flow mechanism.
30. The various bedrock underlying the study area can largely be classed as a low productivity aquifer in which groundwater generally flows through fractures and other discontinuities with fracture flows varying between 0.1 to 1 l/s.
31. The only exception to this is a small area of Buchan Ridge Gravel Member that spans into the southeastern region of the study area. The sedimentary rocks are classified as a moderately productive aquifer with singular intergranular groundwater flow. These aquifers can generally yield up to 5 l/s of potable, but often ferruginous, water.
32. SEPA have classified the quality of all groundwater bodies in Scotland under the Water Framework Directive (WFD)[40]. This map informs that most of the study area is located upon the Mintlaw groundwater unit, with the most easterly region sited on the Peterhead unit, and the most westerly area situated on the Ellon unit.
33. SEPA have classified both the Mintlaw and Peterhead groundwater units as having an overall status of "Good" in 2020 with no limiting parameters. However, the Ellon unit, which surrounds the proposed substation at New Deer, was classified as having an overall status of "Poor" due to its chemical status.

### 9.4.5 Designated sites

34. The southeastern fringes of the study area overlap multiple ecological designations at the coastal cliffs, near Buchan Ness. This sea cliffs encompasses the Buchan Ness to Collieston Coast Special Protection Area (SPA), Buchan Ness to Collieston Special Area of Conservation (SAC), Bullers of Buchan Geological Conservation Review site (GCR), and Bullers of Buchan Coast Site of Special Scientific Interest (SSSI). This area is noted for its vegetated sea cliffs, rock coast geomorphology, maritime cliff habitat and for supporting and for supporting

[38] https://soils.environment.gov.scot/maps/soil-maps/national-soil-map-of-scotland/ (Last Accessed: 24/10/2022)
[39] https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/ (Last Accessed: 24/10/2022)
[40] https://www.sepa.org.uk/data-visualisation/water-classification-hub/ (Last Accessed: 24/10/2022)

various populations of breeding seabirds including, but not limited to, Puffin, Black-legged Kittiwake, and Herring Gull.

35. The Hill of Longhaven SSSI traverses the study area along the southern route, situated upon the Hill of Longhaven. This site is noted for its considerable geomorphological interest of a classic exposure of the deeply weathered granite of north-east Scotland.

### 9.4.6 Surface Water Hydrology

36. There are numerous watercourses located within the study area; these form part of the River Ythan and the River Ugie Catchments. The eastern boundary of the study area also spans across two coastal waterbodies, the 'Cairnbulg Point to the Ugie Estuary' to the north and the 'Buchan Ness to Cruden Bay' coastal water to the south. The Peterhead (Lido) bathing water catchment at Peterhead Bay Marina lies a short distance outwith the study area; there are no bathing water catchments within the study area.

37. SEPA have classified the surface water quality of all significant waterbodies in Scotland under the Water Framework Directive (WFD) (2020)[41]. The WFD named watercourses identified within the study area have been recorded in Table 9.6 along with their overall classification, and potential number of watercourse crossings. It is important to note that the indicative number of water crossings is based upon the two potential cable routes taken presented within this scoping request. This final design will only comprise one cable route, which will reduce the number of required watercourse crossings.

38. There are also a number of unnamed burns and agricultural drainage ditches within the study area that are not classified by SEPA. These watercourses will be included within any further assessments along the finalised cable route, when they are deemed to be potentially impacted by the proposed development.

**Table 9.6 - SEPA classifications of the WFD-named waterbodies within the study area.**

| Name & ID | Catchment | No of Potential Watercourse Crossings | | Overall Status | Limiting Parameters |
|---|---|---|---|---|---|
| | | Northern Route | Southern Route | | |
| Little Water / Black Burn (23237) | River Ythan | 1 | 1 | Moderate | Ecology & Hydromorphology |
| South Ugie Water - Stuartfield to Longside (23224) | River Ugie | 1 | 0 | Moderate | Pre-HMWB & Ecology |
| Quhomery Burn (23226) | River Ugie | 1 | 1 | Moderate Ecological Potential | Pre-Heavily Modified Water Body (HMWB), Ecology, Hydromorphology, & Water Quality |
| Burn of Ludquharn (23225) | River Ugie | 0 | 1 | Moderate Ecological Potential | Pre-HMWB, Ecology, Hydromorphology & Water Quality |
| North Ugie Water - lower catchment (23221) | River Ugie | 1 | 0 | Moderate Ecological Potential | Pre-HMWB, Ecology, & Hydromorphology |

[41] https://www.sepa.org.uk/data-visualisation/water-classification-hub/ (Last Accessed: 24/10/2022)

| | | | | | |
|---|---|---|---|---|---|
| Faichfield Burn (23217) | River Ugie | 0 | 1 | Moderate Ecological Potential | Pre-HMWB, Ecology, Hydromorphology & Water Quality |
| Slains Burn (23199) | Buchan Coastal | 0 | 1 | Moderate Ecological Potential | Pre-HMWB, Ecology & Hydromorphology |
| River Ugie - North/South confluence to tidal limit (23215) | River Ugie | 2 | 0 | Poor | Pre-HMWB, Ecology & Water Quality |

### 9.4.7 Flood Risk

39. SEPA's Flood Hazard and Risk Map illustrates the indicative flood extents of high likelihood (1 in 10-year probability), medium likelihood (1 in 100-year probability), or low likelihood (1 in 200-year probability) of coastal, surface, and river floods[42].

40. Within the study area, SEPA's Map identifies that the watercourses identified in Table 9.6 are all at high risk of river flooding. These flood extents are largely confined to the watercourse channel, except for the 'South Ugie Water - Stuartfield to Longside' stretch of river which has a greater flood extent.

41. The map also indicates a high likelihood of surface water flooding within the study area, which is generally localised to the small unnamed burns, agricultural drains, and drainage ponds. These flood risks are generally identified more frequently towards the coastline. However, there are also some areas of high surface flood risk at various locations along the 'South Ugie Water - Stuartfield to Longside' stretch of river and the 'River Ugie - North/South confluence to tidal limit' stretch of river.

42. Coastal flooding within the study area is largely confined to the coastline at Sandford Bay, where there is noted to be a high likelihood of flooding.

43. The easter section of the study area is noted to be within a 'Potentially Vulnerable Areas' i.e., which indicates that there is potential for flooding to impact on vulnerable areas of people, properties, community services and specific environmental sites.

### 9.4.8 Potentially Sensitive Receptors

44. Several pockets of Class 1 peat have been identified within the study area, these are of national importance and conservation value. Despite the majority of the Class 1 peat being located outwith the proposed working corridors, peat has the potential to be degraded during construction activities. SEPA have also raised concerns over the potential impact of the cable route on Class 1 peat, as detailed in Section 9.3.3. Thus, Class 1 Peat will be included as a sensitive receptor, and an outline Peat Management Plan (PMP) will be submitted alongside the hydrological assessment, which will detail the handling and storage techniques and any proposed mitigation measures.

45. The southeastern fringes of the study area encompass multiple ecological designations at the coastal cliffs, including the Buchan Ness to Collieston Coast SPA, Buchan Ness to Collieston SAC, Bullers of Buchan GCR, and Bullers of Buchan Coast SSSI. Due to the proximity of the sensitive ecological features and the proposed landing point, the proposed development has the potential to impact of the integrity of these ecological sites. As such, these designated sites will be included as a sensitive receptor, if the southern cable route is pursued.

46. The Hill of Longhaven SSSI is located c.200m to the east of the proposed southern route. Despite the proximity, the designated geology is situated at c.7m higher in elevation than the proposed development corridor at its

[42] https://map.sepa.org.uk/floodmap/map.htm (Last Accessed: 24/10/2022)

lowest point. Due to the elevation distance and temporary nature of the construction works, no impacts are predicted from the Proposed Development and therefore, the Hill of Longhaven SSSI will not be considered as a sensitive receptor.

47. Several waterbodies are susceptible to runoff from the Proposed Development and could potentially be at risk of adverse impacts to water quality, ecology, or geomorphology. The watercourses form part of the River Ythan and the River Ugie Catchments, which are known to have salmon and sea trout present, and the study area also encounters two coastal waterbodies. The watercourses and coastal waterbodies will be treated as sensitive receptors and form a focus of the hydrological assessment. The assessment of the watercourses will be determined by the final cable route.
48. Initial discussions with the Environmental Health Officer at Aberdeenshire Council indicated that there are several PWS located within the proposed study area. This information is yet to be confirmed with the landowners however, unless it is confirmed during the further assessment that the water supply is no longer in use, these PWS will be treated as sensitive receptors in the EIA assessment.
49. Should the ecological surveys identify any groundwater dependent terrestrial ecosystems (GWDTE) in the study area, these will be treated as sensitive receptors in the EIA assessment.

### 9.4.9 Potential Impacts

50. The potential impacts this development may have on the water environment of the study area and the surrounding area are likely to include:

- Disruption to the surface and subsurface runoff and watercourses;
- Increased flood risk to areas downstream;
- Sedimentation, erosion, and silt-laden runoff;
- Chemical pollution of watercourses or groundwater;
- Increase in run-off; and
- Drop in the water table.

## 9.5 Assessment and Mitigation

### 9.5.1 Assessment of Effects

51. Potential impacts on the water and ground environment, including environmental receptors dependent upon these resources, will be identified.
52. A qualitative risk assessment will be used to assess potential impacts on the identified receptors in which the probability of an effect occurring and the magnitude of the effect, if it were to occur, are considered. This approach provides an established process for identifying the areas where mitigation measures are required. This allows efforts to be focussed on reducing risk where the utmost benefit may result.
53. Mitigation measures required to address these impacts will be proposed in accordance with best practice guidance.
54. The assessment will consider the construction, operational, and decommissioning stages of the Proposed Development.

### 9.5.2 Mitigation

55. Mitigation measures, where required, will be identified and based on best practice techniques appropriate to site conditions. It is foreseen that the following types of measures could be relevant:

- Avoidance of sensitive areas;
- Appropriate location of proposed onshore infrastructure;
- The implementation of general pollution prevention measures to protect the water quality of the surrounding waterbodies and groundwater; and
- Suitable surface water management and appropriate design of drainage features.

## 9.6 Summary

56. Given the presence of Class 1 peat, designated sites at the coastal cliffs, sensitive coastal waterbodies and watercourses, nearby PWS, and the potential for GWDTEs, there is potential for significant hydrological effects to occur during the construction, operational and decommissioning phases of the development. As such, these sensitive receptors will be scoped in to the hydrological assessment undertaken to inform the EIAR.
57. Given the information set out in Section 9.4.8, The Hill of Longhaven SSSI will be scoped out of the hydrological assessment undertaken to inform the EIAR.

## 9.7 Key Questions for the Council / Consultees

- Q9/1: Do the Council and Consultees agree with the proposed methodology?
- Q9/2: Do the Council and Consultees agree with the proposed study area of 250m from the working corridor?
- Q9/3: Do the Council and Consultees have any further information that would assist in the preparation of the assessments?
- Q9/4: Are the Council or Consultees aware of any further guidance or policy documents not mentioned within the report that are relevant to the assessment?
- Q9/5: Do the Council and Consultees agree with scoping in sensitive water courses and coastal waterbodies, PWS, and GWDTEs?
- Q9/6: Do the Council and Consultees agree with scoping out The Hill of Longhaven SSSI?

# 10 Contaminated Land

## 10.1 Introduction

1. This section describes the proposed approach to addressing potential contaminated land.

## 10.2 Consultation

2. In the May 2022 Scoping Opinion Aberdeenshire Council advised that the proposed cable routes passed through 17 (total) areas of potentially contaminated land, including a landfill. They also advised that there may be unrecorded areas of potentially contaminated land and that the proposed infrastructure may be impacted by the presence of contaminants. The Scoping Opinion also mentions Policy P4 of the LDP.

## 10.3 Methodology

3. The Applicant proposes to undertake a Phase One Geo-environmental assessment in accordance with BS10175, which includes a desk study and site reconnaissance. This will establish a Conceptual Site Model using the standard Source-Pathway-Receptor assessment. Section 9 of this scoping report refers to any impacts the proposals may have on the environment and in particular the Water Environment. The contaminated land assessment will risk-assess any effects that any such contaminated land is likely to have on the proposed cable route, human health during and after construction, the environment in general and the Water Environment, either directly or by the creation of new pathways which may connect Sources to Receptors.
4. The sources of information to be consulted are similar to those listed in Section 9.3.1 above, augmented by site reconnaissance, historical maps, available historical records, further consultation with Aberdeenshire Council and information from the Contaminated Land. Policies such as P4 of the LDP (Hazardous and potentially polluting developments and contaminated land) will be considered in the baseline and the assessment of the potential impacts of the Proposed Development on contaminated land and also the potential impact of any existing contaminated land on the Proposed Development. An understanding of the former uses along the route and the processes involved will be key to establishing the likely nature of any contamination and the risks that such contamination may present.
5. The information will be used to make recommendations with respect to the construction process and to determine what ground investigation (if any) is required. The Phase One assessment will be included as an appendix to the EIA Report and the findings will be summarised and mitigation proposed as required.
6. If intrusive ground investigation is required it is anticipated that this would be undertaken post-consent with the scope to be agreed with Aberdeenshire Council.

## 10.4 Key Questions for the Council /Consultees

- Q10/1: Can the Council provide information they possess relating to contaminated land within the boundary of the Proposed Development?
- Q10/2: Do the consultees agree with the proposed methodology to undertake a Phase One Geo-environmental assessment?

# 11 Noise

## 11.1 Introduction

1. Construction works are required to facilitate the connection of the offshore works to the electrical grid network. Two option areas for an appropriate landing point for the offshore cable and associated infrastructure are being investigated along with two options for the cable run from each of the landing points to the substation at New Deer. All of these options form the basis for the Scoping Exercise.
2. It is likely that the construction works would involve the use of heavy machinery and it is possible that construction activities could extend beyond normal working hours. The route passes close to noise sensitive receptors who could be adversely affected by these operations.
3. Operational noise would only arise through the operation of the proposed substation at New Deer and therefore could only impact nearby receptors.

## 11.2 Policy and Legislation

4. The following sources provide guidance on the assessment of industrial sound levels relevant to the current proposal:

- Planning Advice Note 1/2011 (PAN1/2011): Planning and Noise[43];

5. Guidance on construction / decommissioning phase noise is provided by BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'.
6. Guidance on operational phase noise is given by:

- BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.

7. Guidance on operational phase noise limit criteria is given by:

- BS 8233:2014 'Sound insulation and noise reduction for buildings – code of practice'; and,
- World Health Organisation (WHO) recommendations presented within their 'Guidelines for Community Noise' (1999) and Environmental Noise Guidelines for the European Region (2018).

## 11.3 Consultation

8. A scoping exercise was submitted to Aberdeenshire council in April 2022. A response in relation to noise impacts was received on 20th June 2022. A summary of the response is provided below.

*'In relation to substation noise, we would ask that NR20 is used in preference to NR25, therefore wherever NR25 is referenced this should be replaced with NR20.*

*It is suggested that construction noise impacts are included within an NIA for information, alongside the operational noise impacts.'*

9. In addition to this, the project option areas have since been refined to two cable route options and one substation site option.
10. This report has been updated to reflect both the layout updates and the response received from Aberdeenshire Council.

[43] Scottish Government (2011), '**Planning Advice Note 1/2011**'.

## 11.4 Baseline

### 11.4.1 Study area

11. Two cable route options are currently under consideration. The area included in the cable route options and the site for the proposed substation near New Deer is primarily rural farmland where potential receptors are mostly detached dwellings typical of a rural Aberdeenshire.

12. For the assessment of construction noise, sensitive receptors would be identified as any occupied dwellings lying within 100m of any the proposed infrastructure or within 200m of a directional drilling operation. Beyond these distances, worst case construction noise is predicted to remain below the 55dB(A); a level that would be acceptable during all but night hours.

13. The cables would be buried in a trench approximately 2m wide and 2m deep. The trench would be back filled with the arisings keeping transportation and movement of material to a minimum. Directional drilling would be used to enable the cable to pass under, e.g. roads and water courses, thereby minimising any disruption.

14. The proposed cable routes would coincide with; the A90 either north or south of Peterhead, the A952 that runs south of Mintlaw and the A948 south of Maud. The northern route option would also coincide with the A950.

15. An indicative layout showing potential the proposed cable routes and associated infrastructure is shown in Figures 2.2a-d.

## 11.5 Assessment Methodology

### 11.5.1 Construction Phase Noise

16. Construction of the proposed infrastructure is expected to be carried out over 12 months though the levels of activity would vary considerably and would be at a low level during much of this time. All activities would aim to be completed within daytime hours and the total duration of intensive works e.g. drilling, should be relatively short-lived.

17. The most concentrated construction activity would be centred on the proposed substation near New Deer. It is anticipated that the construction works would be completed over a period of approximately 24 months.

18. The construction noise assessment would follow BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'. Rating levels at sensitive receptors would be calculated using the example sound power data of relevant equipment provided by the code or other suitable data representative of specific equipment. The assessment would consider the different construction phases and suggest best practice processes that could be applied to further minimise any noise impacts.

### 11.5.2 Operational Phase Noise

19. The proposed substation near New Deer is expected to contain the only operational noise sources of potential significance. The impact assessment would follow BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'. Should measured background noise levels be <30 dB(A) $L_{90}$, thereby meeting the BS 4142 definition of 'low' background noise, application of BS 4142 assessment criteria may not be appropriate.

20. For areas that have a low background noise environment, the NR curve criteria presented within BS 8233:2014 'Sound insulation and noise reduction for buildings – code of practice' can be used. As requested by the EHO, the NR criterion would reference NR20. This criterion is conservative relative to World Health Organisation (WHO) recommendations presented within their 'Guidelines for Community Noise' (1999) therefore it is

suggested that the NR20 curve apply to project levels and the NR25 curve suggested in the guideline apply for cumulative noise levels.

21. The assessment would model emissions from the proposed substation infrastructure at the location shown in Figure 2.2c near New Deer. The assessment would consider the closest noise sensitive receptors. Should mitigation be required to meet the NR20 criteria, this would be included to inform the acoustic performance specification of the proposed substation buildings.

## 11.6 Summary

22. Construction activities have potential to be located within 100m of sensitive receptors. All such receptors would be included in the impact assessment. A larger receptor inclusion buffer of 200m is proposed for directional drilling operations. Receptors located beyond the proposed buffers would be scoped out of the construction noise assessment.

23. The NR 20 curve would be adopted as the appropriate assessment criterion for operational noise produced by the proposed substation.

## 11.7 Key Questions for Council and Consultees

- Q11/1: Do the consultees agree that construction noise can be constrained to recommended limits via a suitable planning condition?
- Q11/2: Do the consultees agree with the proposed methodology to derive and to determine compliance with the ETSU-R-97 limits?

# 12 Air Quality

## 12.1 Introduction

1. This section of the report assesses potential for air quality impacts as a result of the Proposed Development. Potential impacts are limited to emissions of dust and particulate matter during the construction phase and increased traffic flows during construction. Impacts relevant to both human receptors and ecological receptors will be considered.

## 12.2 Guidance

2. The Scottish Government has set out standards and objectives for several pollutants that may be harmful to human health or to vegetation and ecosystems[44]. Table 12.1 shows the relevant objectives.

**Table 12.1 - Relevant Scottish Air Quality Objectives for protection of human health and vegetation/ecosystems.**

| Pollutant | Concentration | Measured as |
|---|---|---|
| **Nitrogen Dioxide ($NO_2$)** | 200 µg $m^{-3}$ not to be exceeded more than 18 times a year | 1-hour mean |
| | 40 µg $m^{-3}$ | Annual mean |
| **Particles ($PM_{10}$)** | 50 µg $m^{-3}$, not to be exceeded more than 7 times a year | 24 Hour mean |
| | 18 µg $m^{-3}$ | Annual mean |
| **Oxides of Nitrogen ($NO_X$) – for protection of vegetation and ecosystems only** | 30 µg $m^{-3}$ | Annual mean |

3. The following sources provide relevant guidance on carrying out air quality assessments:

- IAQM – Land-Use Planning & Development Control: Planning For Air Quality[45]
- DEFRA – LAQM.TG(22)[46]
- IAQM – Guidance on the assessment of dust from demolition and construction[47]

## 12.3 Consultation

4. A consultation response was received from Aberdeenshire Council Environmental Health. The response states that Environmental Health agree that air quality impact assessments are not required for construction traffic and operational dust and agree with the proposed methodology.

[44] Air Quality in Scotland (2021), 'Standards', http://www.scottishairquality.scot/air-quality/standards.
[45] IAQM (2017), 'Land-Use Planning & Development Control: Planning For Air Quality'.
[46] DEFRA (2022), 'Local Air Quality Management Technical Guidance (TG22)'.
[47] IAQM (2014), 'Guidance on the assessment of dust from demolition and construction'.

## 12.4 Baseline

5. Air quality is generally good in Aberdeenshire; there are no exceedances of national objectives and no Air Quality Management Areas (AQMAs)[48].
6. Aberdeenshire Council has no automatic monitoring stations and 11 diffusion tube sites monitoring $NO_2$. The nearest of these to the development locations are the two diffusion tubes in Peterhead. The highest annual mean concentration of $NO_2$ measured in Peterhead in 2020 was 14.1µg/m$^3$, which is significantly below the annual mean objective of 40µg/m$^3$. The proposed cable routes mostly fall within rural areas where air quality is expected to be higher than in Peterhead.
7. No particulate matter ($PM_{10}$) monitoring is currently carried out in Aberdeenshire. In the absence of monitoring data in the vicinity of the proposed cable routes and substation option areas, annual mean background concentrations of relevant pollutants have been sourced from Air Quality in Scotland background maps[49] for the year of 2021 and are provided in Table 12.2.

**Table 12.2 - Background concentrations of $NO_2$, $NO_X$, and $PM_{10}$.**

| Pollutant | Maximum Annual Mean Background Concentration along proposed cable routes |
|---|---|
| $NO_2$ | 5.2 µg m$^{-3}$ |
| $NO_X$ | 7.3 µg m$^{-3}$ |
| $PM_{10}$ | 11.4 µg m$^{-3}$ |

## 12.5 Potential Sources of Impacts

8. Sources of emissions with a potential impact on air quality have been identified as follows:

- Construction and decommissioning phases
  - Dust and PM10 emissions
  - NO2 and NOX emissions from construction traffic and equipment

9. No emissions are expected during the operational phase.

## 12.6 Methodology

### 12.6.1 Construction and decommissioning phase dust

10. The IAQM guidance suggests carrying out a construction dust assessment where there is a human receptor within 350m of the site boundary or an ecological receptor within 50m of the site boundary. A number of residential properties are within 350m of the proposed cable routes. No dust-sensitive ecological sites have been identified within 50m of the construction boundaries. It is, therefore, anticipated that an air quality impact assessment for construction dust will be required.
11. A qualitative construction dust assessment will be conducted using the IAQM 'Guidance on the assessment of dust from demolition and construction' methodology. This will determine the activities being carried out that may release dust. The risk of dust impacts for each process will be assessed based on the potential dust

[48] Aberdeenshire Council (2021), '2021 Air Quality Annual Progress Report (APR) for Aberdeenshire Council'.
[49] Air Quality in Scotland (2021), 'Data for Local Authority Review and Assessment purposes', http://www.scottishairquality.scot/data/mapping?view=data

emission magnitude and sensitivity of the area. Appropriate mitigation measures will be determined, and the significance of effects identified after mitigation.

12. The IAQM guidance states that mitigation measures should ensure that significant adverse effects do not occur, therefore, no significant effects are expected after mitigation.

### 12.6.2 Construction and decommissioning phase traffic

13. During the construction phase, pollutants will be emitted via vehicle exhaust from on-site plant and site traffic. It is not expected that the modest increase in vehicle movements will have any impact on the current level of air quality in the local areas.

### 12.6.3 Operational phase dust

14. Operational phase emissions will be limited to minor dust emissions during maintenance activities. It is not expected that these activities will have any impact on the air quality in the local areas.

## 12.7 Summary

15. Given the proximity of residential properties, a qualitative construction dust assessment will be scoped in to the EIA.
16. The modest increase in vehicle movements during construction is not expected to have any impact on air quality, therefore, an air quality impact assessment for construction traffic can be scoped out.
17. Operational phase emissions will be minimal and limited to maintenance activities, therefore an operational dust assessment can be scoped out.

## 12.8 Key Questions for Council and Consultees

- Q12/1: Do the consultees agree that air quality impact assessments for construction traffic and operational dust are not required?
- Q12/2: Do the Council and consultees agree with the proposed methodology for construction dust assessment?

# 13 Other Considerations

1. This section addresses any other issues which require consideration but have not been covered in a separate section of the Scoping Report and includes the following aspects:

- Public Rights of Way/Core Path Assessment
- Traffic and Transport
- Agricultural Land

2. Through standard methods of assessment, predicted effects for these issues will be judged as either significant or not significant.

## 13.1 Public Rights of Way/Core Path Assessment

### 13.1.1 Introduction

3. This section of the scoping report will assess any potential impacts on core paths and public rights of way, and the users of these facilities, within the route corridor during the construction and operational phases.

### 13.1.2 Methodology

4. In order to assess potential effects on users, the following legislation, policy and guidance will be consulted:

- Land Reform Act (Scotland) 2003 (as amended 2016);
- Scottish Planning Policy 2020;
- Aberdeenshire Local Development Plan 2017;
- Aberdeenshire Core Path Plan; and
- Aberdeenshire Council Planning Advice No 10/2015: Outdoor Access & Development.

5. The following web sources will also be consulted:

- Sustrans;
- NatureScot;
- Scotland's Great Trails Website; and
- Aberdeenshire Council.

6. Any potential effects associated with the construction and/or operation of onshore works will be based on any estimated changes to recreational facilities in the local area. This includes changes in the accessibility and amenity of core paths and public rights of way. For the purpose of this assessment, amenity refers to a combination of visual amenity, air quality and noise levels experienced by the users of core paths and public rights of way.

### 13.1.3 Consultation

7. Consultation has already taken place with Aberdeenshire Council via the May 2022 scoping opinion. It was encouraged to scope any impacts on public access to core paths and public rights of way into the EIAR, specifically the Formatine and Buchan Way and coastal routes. The council wish to be engaged with throughout the EIAR process to discuss potential impacts and proposed mitigation measures. It was also requested that the EIAR should confirm the exact method of cable lying at crossing sites.

8. The Applicant has also had meetings with Aberdeenshire Council to discuss how the Formartine and Buchan Way will be crossed and what measures may need to be put in place to mitigate potential temporary closures. Aberdeenshire Council environmental officers advised that exact steps cannot be confirmed until it is understood exactly where the cable route will be located and the exact construction methodology is confirmed. Once this is known post-detailed design, the Applicant will work with the Council to mitigate any potential effects to the core path.
9. NatureScot have been consulted with but had no comments on core paths or public rights of way.
10. Further consultation aims to be undertaken with:

- Community Councils;
- The Scottish Rights of Way and Access Society (ScotWays);
- British Horse Society; and
- Mountaineering Scotland.

### 13.1.4 Potential Significant Effects

11. It is anticipated that there will be no significant effects on recreation; however, there will be temporary adverse effects on access to core paths during the construction phase due to temporary restrictions on the surrounding area.
12. Given the linear nature of the Development, it is neither possible nor practical to avoid crossing all footpaths and walkways along the length of the route. The proposed routes cross the Formartine and Buchan Way twice; on the five mile segment Auchnagatt to Maud, roughly 2.6km to the south-west of Maud, and the six mile segment Longside to Peterhead, roughly 0.2km to the north-west of Longside. Open trenching will be used for laying the cables. Appropriate mitigation will be implemented at this time to limit disruption.
13. The Southern landing point and beginning of the Southern route corridor will not cross, but be in close (<500m) proximity to, the Coastal Path from Boddam to Cruden Bay. Any potential effects to the amenity of this core path will be assessed within the EIAR to limit any potential disruption.
14. The Northern route will also not cross, but be in close (<500m) proximity to, the Longside Harvest Hill core Path. Any potential effects to the amenity of this core path will be assessed within the EIAR to limit any potential disruption.

### 13.1.5 Mitigation

15. A maximum duration of two days per crossing is anticipated to allow for backfilling and reinstatement. Temporary fencing will be installed where necessary when the proposed routes cross any Core Paths and/or Public Right of Way, providing appropriate separation between installation traffic and recreational users. When these facilities are out of use, appropriate diversions and signage will be installed as necessary.
16. The amenity of recreational facilities and activities may be affected at this time which may cause an adverse impact on user experience. Proposed diversions will take account of this and, where suitable, aim to improve access arrangements, which may result in a beneficial effect. The possibility, and suitability, for incorporating such arrangements will be explored within the EIA Report.
17. Any temporary rerouting of the core path routes will comply with Planning Advice, N0 10/2015 Outdoor Access and Development and will be agreed in conjunction with Aberdeenshire Council.

### 13.1.6 Conclusion

18. Although no significant effects are expected, some temporary adverse effects are anticipated to occur during the construction phase of the proposal. As some sections in the Formatine and Buchan Way may need to be

diverted and re-routed, and mitigation will need to be proposed, it is considered that the assessment of public rights of way and core paths should be scoped in any future EIAR.

## 13.2 Traffic and Transport

19. This assessment will identify the preferred routes for access along the route corridor and will consider the potential effects of traffic generated during construction and operation of the works, including identification of measures to minimise any disruption to the local and strategic road network.

### 13.2.1 Consultation

20. Following the previous request for scoping opinion on the Proposed Development to Aberdeenshire Council. Aberdeenshire Council Infrastructure Services highlighted in their response that they are satisfied with the proposals within the scoping report; however, they have requested that the following statement would also need to be included:

21. *"Any new or temporary junctions formed on the public road network, e.g for haul roads, storage compounds etc must meet the Local Authority standards in terms of junction visibility. All such proposed accesses will be identified and forwarded to the Local Authority for approval."*

22. Transport Scotland and Aberdeenshire Council will be approached for information to inform the forthcoming planning application.

### 13.2.2 Method of Assessment

23. The study area for the traffic and transport assessment will be the public road network in the vicinity of the works, which will be used during construction. Traffic count data will be sourced from Transport Scotland and Aberdeenshire Council to inform the assessment if available. The assessment of effects on traffic and transport will be carried out in line with the following guidance:

- Aberdeenshire Local Development Plan 2017;
- Scottish Planning Policy 2020; and
- The Transport Assessment Guidance. Transport Scotland (2012).

### 13.2.3 Baseline

24. The main road in the area is the A90 which runs around Peterhead (north-south) and the A952 which runs through Mintlaw (north-south). Linking the roads in the A950 which runs west from Peterhead through Mintlaw.

25. Most of the road network within the vicinity of the works comprise "B" or unnamed roads which provide links for the small settlements and individual properties to the wider network.

### 13.2.4 Potential Effects

26. Taking account of the findings of the work undertaken to date, whilst still adopting a precautionary approach at this preliminary stage, potential effects associated with the construction and/or operation of the works include effects of construction traffic on existing traffic flows and the public road network.

### 13.2.5 Potential Mitigation and Monitoring

27. Commitment will be made to implement accepted good practice during construction, operation and maintenance of the works thereby ensuring that potential effects on traffic and transport can be avoided or reduced.

28. Where potentially significant effects on traffic and transport are identified, measures to prevent, reduce and where possible offset these adverse effects will be proposed. Measures likely to be utilised include:

- Instructing abnormal loads, Heavy Goods Vehicles (HGVs), and site personnel as appropriate, to use only the approved access routes to the site;
- Ensuring appropriate diversions are in place during construction if necessary to allow for continued access to homes and businesses including the transport of heavy goods and emergency vehicles;
- Scheduling works out with hours of peak activity on local roads when possible;
- Development of a travel plan to encourage sustainable transport during the construction phase (e.g. multi occupancy of site staff vehicles, use of minibuses etc.);
- Use of appropriate boring/drilling techniques to avoid impacts on rail and road infrastructure; and
- Timing of construction works to avoid disturbance to road traffic

### 13.2.6 Conclusion

29. No significant adverse effects are anticipated from the movement of materials, plant and personnel. A range of mitigation measures are available that can further address potential impacts on the road network. As such it is considered appropriate for Traffic and Transport to be scoped out of any EIA.

## 13.3 Agricultural Land

### 13.3.1 Introduction

30. This section sets out the proposed approach to the assessment of potential effects of the onshore works on soils, agriculture and land use during both construction and operation. It will consider soil quality in relation to land capability for agriculture or forestry. Soil issues in relation to ground conditions and geology are considered in Chapter 9.

31. National planning policy on agriculture is set out in the Scottish Government's Scottish Planning Policy (SPP). This re-affirms previous commitments to the protection of the best and most versatile agricultural land for productive agricultural uses. The policy also draws stronger linkages between land use, agriculture, sustainability, renewable energy and climate change.

32. A number of recent strategies published by the Scottish Government and other agencies also highlight the importance of agriculture, soils and forestry in helping to achieve the Government's priorities for sustainable economic growth. Those which deal specifically or extensively with such land uses, and which would be taken account of in the assessment, include the following:

- A Future Strategy for Scottish Agriculture (2018);
- The Scottish Soil Framework (2009);
- The Scottish Forestry Strategy 2019- 2029 (2019);
- Land Use Strategy for Scotland (2021);
- and The Scottish Outdoor Access Code (2018)

33. The protection of soils, prevention of diffuse pollution and controls over application of nutrients to soils are all issues which cut across the work of other agencies such as NatureScot and SEPA. Relevant guidance from these bodies, for example relating to Nitrate Vulnerable Zones and Controlled Activities Regulations would also be considered in the assessment of impacts on land use and soils.

### 13.3.2 Method of Assessment

34. The assessment will focus on potential effects on land uses, agricultural activity and soils directly affected by the proposed onshore works and will include the following:

- Identification of data on Land Capability for Agriculture, from published sources;
- A review of other desk top sources on soil quality, extent etc. (e.g. Soils Maps); and
- Field surveys and interviews with agricultural land interests to collect baseline information on farm type, agricultural activity and sporting interests

35. Land Capability for Agriculture is classified in Scotland in seven classes ranging from Class 7 which is land of very limited agricultural value to Class 1 which is capable of producing a very wide range of crops. Land in classes 1, 2 and 3.1 is capable of supporting arable agriculture.

36. The assessment will focus on potential effects on land uses, agricultural activity and soils directly affected by the proposed onshore works and will include the following:

- Identification of data on Land Capability for Agriculture, from published sources;
- A review of other desk top sources on soil quality, extent etc. (e.g. Soils Maps); and
- Field surveys and interviews with agricultural land interests to collect baseline information on farm type, agricultural activity and sporting interests.

37. Following established good practice, the assessment will seek to minimise the area of forestry impacted in the application in order to minimise woodland impacts.

38. The final cable route to be taken forward to assessment will avoid the removal of trees and forestry as far as possible, by following existing rides where the route runs through forested areas. Trees will be protected during installation in accordance with BS 5837:2012[50].

39. In line with Aberdeenshire Forestry and Woodland Strategy 2016[51] it is intended that compensatory planting of woodland will be provided within Aberdeenshire. It is anticipated that a Compensatory Planting Plan will be required to be submitted to the Council prior to commencement of any works.

40. Areas of woodland removal arising as a result of the Proposed Development would be identified, quantified and detailed as part of this assessment.

41. Potential impacts may include changes to commercial forest layout as a result of premature harvesting of timber and impacts on coupe design or timber production. Given the absence of essential infrastructure footprints associated with Proposed Development, there will be no forestry removal associated with such features.

42. Where impacts are unavoidable, mitigation will include the development of revised forestry proposals in consultation with the landowners and these will be summarised in the final submission.

### 13.3.3 Baseline

43. Key land uses along the route corridor include agriculture and forestry. The proposed route corridors contain a wide range of farming enterprises. Spanning from Peterhead to Boddam, the soil is predominantly Class 3.2 the land is used to grow vegetables and potatoes as well as cereals and oilseeds. There are areas where the

[50] https://beta.bathnes.gov.uk/sites/default/files/2020-01/BS5837%202012%20Trees.pdf (accessed 17/09/2021)
[51] https://www.aberdeenshire.gov.uk/media/15632/2016-0003845-2016-02-04-proposed-aberdeenshire-forestry-and-woodland-strategy-2016.pdf (accessed 17/09/2021)

land is capable of a more limited range of crops and the proportion of grass increases, stocked with cattle and sheep.

### 13.3.4 Potential Effects on Soils, Agriculture and Land Use

44. Taking account of the findings of the work undertaken to date, whilst still adopting a precautionary approach at this preliminary stage, potential effects associated with the construction and/or operation of the onshore works include:

- Direct loss of agricultural land, by agricultural land classification;
- Direct loss of woodland, by type and activity
- Indirect effects on soil quality including changes in land capability (for agriculture or forestry);
- Environmental effects such as diffuse pollution from mobilisation of soils and changes in agricultural/land drainage and/or effects on agri-environmental schemes;
- Changes in agricultural and woodland activity;
- Changes in sporting uses and viability; and
- Changes in access

### 13.3.5 Potential Mitigation and Monitoring

45. There will be a commitment to implementing accepted good practices during construction, operation and maintenance of the onshore works thereby ensuring that many potential effects on soils, agriculture and land use can be avoided or reduced. Generic mitigation and also site-specific measures will be identified including;

- A soil protection strategy (topsoil and subsoil); Land drainage management;
- Avoidance of transmission of soil pests and diseases;
- Maintenance of water supplies; and
- Temporary and permanent access/accommodation works.

46. Reference will also be made to the mitigation measures in relation to pollution prevention and soil erosion provided in Chapter 9.

### 13.3.6 Consultation

47. The consultees below will be approached for information to inform the EIA. Aberdeenshire Council may also contact a number of these consultees regarding the scope of the EIA:

- The National Farmers Union Scotland;
- The Scottish Rural Property and Business Association (SRPBA);
- Forestry Commission Scotland and Forest Enterprise Scotland; and
- Commercial agricultural and forestry enterprises identified.

### 13.3.7 Conclusion

48. No significant adverse effects are anticipated from the Proposed Development on the type or quality of agricultural land. A range of mitigation measures are available that can further address potential impacts on scarce land resources. Following from Aberdeenshire Council's previous scoping opinion the impact to agricultural land will be fully considered in the EIA Report.

### 13.3.8 Key Questions for Council and Consultees

- Q11/1: Are the scopes of the assessments appropriate?
- Q11/2: Are there any additional consultees, other than those mentioned above, who should be contacted to inform the assessment?

# Appendix A – Figures

# Appendix B – Ecology Desktop Appraisal

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GREEN VOLT

# Appendix 1.4

## New Scoping Opinion

Onshore EIA Report: Volume 3

Aberdeenshire COUNCIL

Our Ref: ENQ/2023/0008
Your Ref:

Ask for: Elizabeth Tully
Tel: 01467 533417
Email: elizabeth.tully@aberdeenshire.gov.uk

Greencat Renewables
Stobo House
Roslin
EH25 9RE

3 March 2023

Dear Sir/Madam

**The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017**
**EIA Screening/Scoping Opinion for Erection of 300MW Floating Windfarm - Onshore Infrastructure at Green Volt Offshore Windfarm, Ettrick/Blackbird Oil And Gas Fields Grid Reference: 397654.844628**

I refer to your request for a scoping opinion for the above proposal received on 5 January 2023, following an initial response from the Council (dated 11/05/2022) regarding a previous iteration of the development (ENQ/2022/0373). I am now in receipt of all the necessary consultation responses and I can now offer a scoping opinion under Regulation 17 of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the Regulations).

Schedule 4 of the Regulations states the information which should be included in an Environmental Impact Assessment Report (EIAR). These guidelines offer the backbone to the structure of an EIAR and should be used as the basis for your submission.

In order to make an assessment of the above information there are specific criteria and guidance set out in Schedule 4 of the Regulations. In particular these include characteristics of the development, an outline of any alternative options/sites and the main reasons for the options/sites chosen. Environmental issues are of obvious key importance such as those aspects of the environment that would be likely to be significantly affected. Detailed survey work would be required to inform the EIAR. Following analysis of the aspects of the environment which would be likely to be significantly affected, a detailed assessment of the effects themselves would be required along with mitigation measures proposed.

Examples of the types of issues that should be addressed include:

• Climate change
• Local Economic Effect

• Landscape Resource
• Soils and geology
• Visual Amenity
• Ornithology
• Visual Amenity
• Ecology
• Nature Conservation
• European Protected Species
• Hydrology and Water Supplies
• Forestry and Tree Felling
• Transport and Traffic including road safety issues and impact on local road network during and after construction work
• Noise
• Cultural Heritage and archaeology
• Land Use
• Land Ownership
• Tourism and Recreation, including footpaths
• Proposed mitigation measures

Please note that the above list is by no means exhaustive and that other issues might become obvious following public consultations and consultations with statutory consultees.

**Planning Policy**

On 13 February 2023 Scottish Ministers adopted and published National Planning Framework 4 (NPF4), meaning that it is in force and National Planning Framework 3 and Scottish Planning Policy are superseded from that date and time. This will also have the effect that all strategic development plans and any supplementary guidance issued in connection with them cease to have effect on that date. As such the Aberdeen City and Shire Strategic Development Plan 2020 has now ceased to have effect. The NPF4 now forms part of the development plan (along with the Aberdeenshire Local Development Plan 2023) and as such is a significant material consideration in the decision making process.

The most relevant policies of NPF4 you may wish to consider within an EIAR include:

- Policy 1: Tackling the climate and nature crises
- Policy 3: Biodiversity
- Policy 4: Natural Places
- Policy 5: Soils
- Policy 6: Forestry, woodland and trees
- Policy 7: Historic assets and places
- Policy 10: Coastal development
- Policy 11: Energy
- Policy 20: Blue and green infrastructure
- Policy 22: Flood risk and water management
- Policy 23: Health and safety
- Policy 29: Rural development

You will also be aware that the Aberdeenshire Local Development Plan 2023 was adopted in January. The policies indicated within the scoping report to be considered within the 'LDP 2020' seem appropriate.

The scoping report suggests that reference will be made to NPF3 and SPP, however as these have now been superseded by the adoption of NPF4, this is not required.

Paragraph 14 of the scoping report also references other renewable energy documents to be described within an EIAR, however I would bring to your attention that the Onshore Wind Policy Statement (2017) (OWPS 2017) has been superseded by the Onshore Wind Policy Statement adopted in December 2022. There is also a consultative draft of the Draft Energy Strategy and Just Transition Plan which you may wish to address as this will likely, in time, supersede the Scottish Energy Strategy (2017). It is encouraged that the most recent documents are referenced and discussed in an EIAR.

It is mentioned that the proposed development is sited fully within the Buchan administrative area. It should be noted that the proposed substation locations fall within the Formartine administrative area, but the majority of the cable route and landfall options are all within the Buchan area.

**Landscape and Visual Impact**

The proposed 1km study area from the centre of the cable route is accepted.

The methodology proposed to assess the landscape and visual impacts appear acceptable. The inclusion of a Residential Visual Amenity Assessment (RVAA) is welcomed with the Landscape Institute Guidance seeming appropriate.

It is agreed a cumulative visual assessment should be included within an EIAR, particularly for the proposed substation.

Visualisations showing the baseline and built development should be included within the EIAR. Consideration should be given to the inclusion of the construction compound for the jointing bay within visualisations as this will have a visual impact during the construction period, albeit temporary. Visualisations should include any landscaping or mitigation proposed. When visualisations include proposed landscaping, they should show it at year one and year ten to demonstrate its maturation. The visualisations should be based on a ZTV which the Council would be happy to consider and assist with viewpoint selection.

Landscape and visual impacts should be considered by a range of receptors (i.e. road users, those using the Formartine and Buchan Way, recreational hillwalkers etc) where possible and include various landscape character types (as per the NatureScot Landscape Character Assessment 2019) and landscape designations (including Special Landscape Areas (SLA's)) as appropriate.

**Ecology**

The contents of Section 6 of the scoping report are noted. Comments within this section of the scoping opinion relate to protected species and protected sites.

There are various protected areas along and surrounding the proposed landfall, cable route and substation options as noted in Tables 6-2 and 6-3 of the scoping report. The EIAR shall assess in full any impacts the onshore works will have on the qualifying interests of the protected areas and indicate any required mitigation.

The protected species included within the scoping report and the proposed survey methodology appears appropriate. No additional surveys are advised to be taken at this stage, however it is reminded that additional surveys and studies may become apparent at a later stage.

It is advised that the proposed CEMP should include Species Protection Plans unless these are to comprise a separate standalone document. Tree protection proposals will also be required particularly where works are in close proximity to woodland included in the NatureScot Ancient Woodland Inventory.

It is noted that mitigation is proposed, however there is now the expectation that developments delver biodiversity net gain through enhancement measures. This is a requirement of both NPF4 and the Aberdeenshire LDP 2023. Biodiversity enhancement should form part of the proposed development and be discussed fully within an EIAR.

Your attention is drawn to the consultation responses provided by NatureScot and the Council's Environment team who each address protected sites, protected species and biodiversity.

**Ornithology**

NatureScot notes some inconsistencies within the scoping report regarding seabirds of interest to the Buchan Ness to Collieston Coast Special Area of Conservation (SAC); Buchan Ness to Collieston Special Protection Area (SPA); and Bullers of Buchan Coast Site of Special Scientific Interest (SSSI). NatureScot advises in their response that disturbance to bird species using the waters of the marine section of the SPA should be considered within an EIAR as HDD work during the seabird breeding season may cause disturbance to the bird populations and affect the integrity of the SPA. It is acknowledged that HDD work outwith the seabird breeding season is not likely to have a significant effect on the SPA.

NatureScot acknowledges the approach to outline principles for biodiversity enhancement with regard to ornithological interests.

Environment and Infrastructure Services (Environment – Natural Heritage) have no comments to make in addition to those made by NatureScot.

It is noted within 7.8.4 that sensitive ornithological information will form a confidential appendix to the EIAR and will be provided to NatureScot. Aberdeenshire Council would also request sight of this appendix and confirm the contents will not be shared publicly.

**Cultural Heritage**

Your attention is drawn to the responses provided by Historic Environment Scotland and the Council's Archaeology team.

Section 8.2 references superseded national and local policies. As per the 'Planning Policy' section above, the most up to date policies should be used in the production of the EIAR.

The EIAR and proposal should include an assessment of impacts on heritage assets and their settings. NPF4, Historic Environment Policy for Scotland (HEPS, 2019) and the associated managing change guidance notes. Guidance can also be found in the Cultural Heritage appendix of the EIA Handbook (SNH, HES, 2018) and should also be referred to in an EIAR.

HES are content that impacts on nationally important historic environment assets will be assessed up to 5km from the proposed substation location and within a 500m corridor of the chosen cable route.

HES does not accept that impacts on the setting of monuments are 'indirect', with impacts having the potential to have a direct effect on the cultural significance of the asset. It is also not accepted that direct physical impacts on a designated asset can be of 'medium' magnitude. Any direct effect on a designated monument is an effect of high magnitude.

It is suggested that Gight Castle and Gight Castle dovecot should be given consideration within an EIAR and not scoped out as suggested. Consideration should be given to the impact on the setting of an asset that is not directly intervisible with a development, where views towards the asset would also include the development. Any assets of national importance within the 5km study area are scoped out, a detailed explanation should be given within an EIAR.

Environment and Infrastructure Services (Archaeology) answers each of the questions posed within this chapter within the response.

**Geology, Hydrology, Hydrogeology and Soils**

The following information should be submitted in support of an application:

- Map and assessment of any engineering activities in or impacting on the water
- environment including proposed buffers and details of any related CAR applications.
- Map and assessment of impacts upon Groundwater Dependent Terrestrial Ecosystems (GWDTE) and buffers.
- Map and assessment of impacts upon groundwater abstractions and buffers.
- Peat Management Plan or Schedule of Mitigation for excavated peat, if applicable.
- Schedule of mitigation including pollution prevention measures
- Map of proposed surface water drainage layout.
- Decommissioning statement.
- Drainage Impact Assessment.

The response from SEPA is detailed and answers each of the posed topic specific questions within the scoping report.

**Contaminated Land**

The inclusion of contaminated land chapter is welcimed, following the Aberdeenshire Council response to the first scoping report in 2022. The contents of Section 10 are noted.

The Council are happy to engage further regarding the provision of information relating to contaminated land.

The proposal to undertake a Phase One Geo-Environmental assessment is welcomed.

**Noise**

The inclusion of the noise chapter is welcomed, following the initial response by Aberdeenshire Council in 2022. It is accepted that noise during the construction phase would be construction activity of the landfall, trenching for the cable laying and construction of the substation. Operational noise would be limited to the operation of the substation.

Q11/2 within the scoping report references ETSU-R-97 (Onshore wind turbines: planning advice) as the methodology to derive noise limits, however this is incorrect. It is suspected this is an error in drafting the scoping report as ETSU-R-97 is not discussed within the methodology section 11.5 of the report. The methodology contained within section 11.5 is acceptable, as confirmed within the Environmental Health consultation response.

Engagement with Environmental Health colleagues is encouraged prior to carrying out noise assessments.

**Air Quality**

The contents of section 12 are noted. It is agreed that air quality impact assessments are not required for construction traffic and operational impacts.

The construction dust assessment methodology as detailed within section 12.6 is acceptable.

Engagement with Environmental Health is encouraged to discuss the proposed assessments.

**Other Considerations**

<u>Public rights of way/Core Path Assessment</u>

The inclusion of the PROW/ Core Paths section is welcomed to consider the impacts and any mitigation required.

Discussions are on-going with the Council to discuss the proposal. Continued engagement is encouraged and welcomed.

<u>Traffic and Transport</u>

The contents of Section 13.2 of the scoping report are noted. The study area identified appears acceptable at this stage. The method of construction/cable laying is not identified within the scoping report and should be addressed within the EIAR (i.e. HDD/open trenching) as this will affect the potential impacts and mitigation required.

Environment and Infrastructure Services (Roads Development) are generally satisfied with the proposals contained within the scoping report, however additional information including development extents and traffic management plan identifying the types of vehicles proposed, along with any extra ordinary vehicles and delivery routing should be provided at the planning application stage. It is suggested that the EIAR include all details of new or temporary junctions formed on the public road network (i.e. haul roads, storage compounds etc). These must meet the local authority standards in terms of visibility. As no locations for construction compounds etc along the route are identified, nor is the substation location confirmed, Environment and Infrastructure Services (Roads Development) cannot provide specific comments regarding specific locations. Engagement with the local authority is advised to discuss proposals.

Transport Scotland have made no comment on the contents of the scoping report. It is advised early engagement is taken with Transport Scotland to discuss proposals, potential impacts and likely mitigation measures.

Agricultural Land

Land within the cable corridors include 'Prime Agricultural Land' (PAL) and areas of forestry, also identifying potential effects including direct loss of agricultural land and woodland, along with indirect effects upon soil quality as a result of the proposed development.

Although woodland would be directly lost from the proposed development, the avoidance of ancient woodland is welcomed. There is, however, no consideration of compensatory planting as mitigation within the scoping report. This should be considered and identified within the EIAR, as should any mitigation required to reduce impacts upon PAL. Tree protection proposals are also required, particularly where works are in close proximity to woodland included in the NatureScot Ancient Woodland Inventory.

The inclusion of agricultural land and forestry within an EIAR is welcomed, following the previous scoping opinion given by Aberdeenshire Council.

Overall, the consideration of points made within the previous scoping opinion given by the Council is appreciated. You are reminded to ensure reference to the most up to date policies and guidance is made within the EIAR. Continued engagement is encouraged throughout the EIAR drafting process,

I hope the above information is of assistance as a formal scoping opinion in respect of the relevant EIA Report. Obviously during the processing of any associated planning application other issues may become obvious following public consultation and consultations with statutory consultees.

This opinion will be held for public inspection for a two year period, or until a planning application is submitted at which time the opinion will be transferred to the planning register with the application.

Yours faithfully

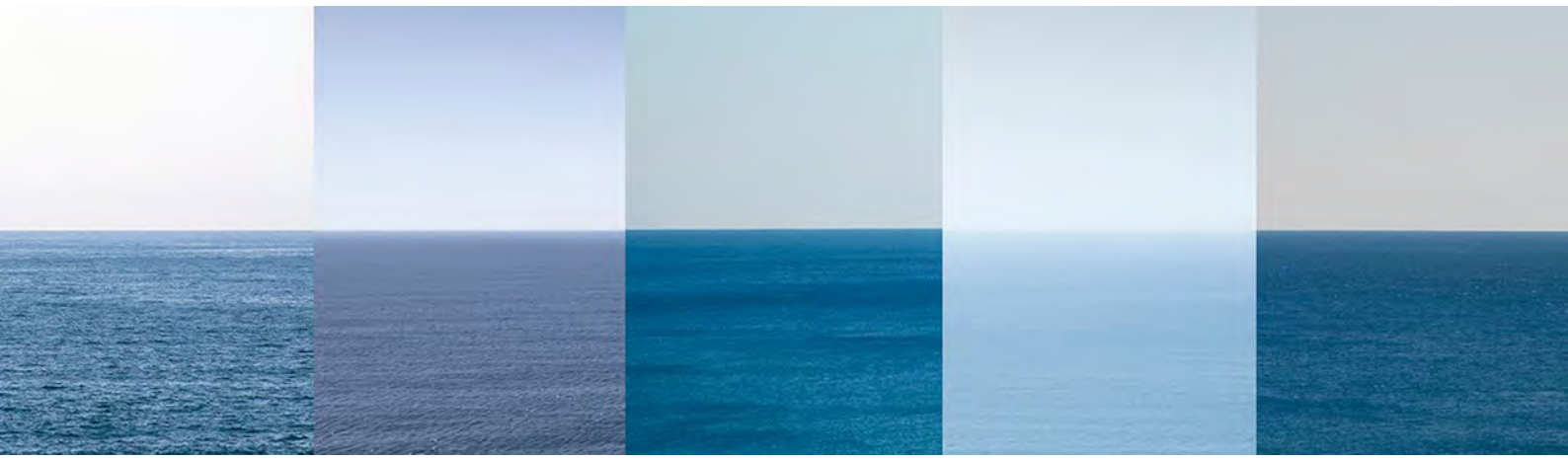
Paul Macari
Head of Planning and Economy

GREEN VOLT

# Appendix 4.1

## Landfall Feasibility Report

Onshore EIA Report: Volume 3



# Green Volt Export Cable

## Landing Point Feasibility Study

For Flotation Energy

PRJ108335-GEO-RP-02 Client Reference

| | | | | | |
|---|---|---|---|---|---|
| | | | **Geotechnical Engineer** | **GIS Lead** | **Head of Geoscience** |
| Rev2 | 06/06/2022 | For information | | | |
| | | | Mehmet Ilcioglu | Liam Murray | Gareth Ellery |
| **Rev** | **Date** | **Document Status** | **Prepared by** | **Reviewed by** | **Approved by** |

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## DOCUMENT ISSUE RECORD

| Rev | Date | Status | Prepared by | Reviewed by | Approved by |
|---|---|---|---|---|---|
| 1 | 26/01/2022 | For client review | GE | LM/ML | GE |
| 2 | 06/05/2022 | For client review | MI | LM/GE | GE |
| | | | | | |
| | | | | | |
| | | | | | |

## DOCUMENT CHANGE RECORD

| Rev | Section(s) | Page(s) | Brief Description of Change |
|---|---|---|---|
| 1 | | | Original Issue to Client |
| 2 | Throughout | | Removal of Boddam Options, add NorthConnect Parallel Option |
| | | | |
| | | | |

## DOCUMENT HOLD RECORD

| Section(s) | Page(s) | Brief Description of HOLD |
|---|---|---|
| | | |
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# 1. SUMMARY

Flotation Energy are developing the Green Volt floating offshore wind project to decarbonise the Buzzard oil and gas field, NNE of Aberdeen, Scotland. As part of the development, there will also be an electrical connection to shore, to export excess energy to grid, and to also take energy from the grid when and if needed.

This study examines the feasibility of shore landing the cables, at predetermined sites provided by Flotation Energy. The study establishes the viability of each option in terms of access and site area, constraints, geological and geotechnical conditions and HDD drill length feasibility. The study also examines the nature of the immediate nearshore area, particularly in terms of water depth and construction access to the HDD exit pit, and the potential to secure the cables through burial in the seabed.

Multiple sites have been deemed to be feasible by this study, which has also been taken into account for offshore route survey planning.

Following offshore routing and DTS work, this Rev2 version of the report removes the originally considered Boddam landfall options and includes a new option for landfall at the planned NorthConnect HVDC project landfall.

# 2. INTRODUCTION

## 2.1 Green Volt Floating Offshore Wind Farm

Flotation Energy are developing the Green Volt floating offshore wind project to decarbonise the Buzzard oil and gas field, NNE of Aberdeen, Scotland. As part of the development, there will also be an electrical connection to shore, to export excess energy to grid, and to also take energy from the grid when and if needed.

The onshore grid connection is planned with a new substation at New Deer, 24km West of Peterhead. The onshore routing and substation location has been investigated by Greencat Renewables [1] and has resulted in a number of potential cable landing locations at St Fergus and Collieston Coast.

## 2.2 Scope of Work

The purpose of this study is to review the potential cable landing options from an offshore cable routing and technical feasibility perspective including, but not limited to:

- Geological and geotechnical conditions
- Potential for nearshore burial
- HDD feasibility, including drill length
- Constraints – both natural and anthropogenic
- Access to HDD construction and launch areas

The outcome of this study will then inform the initial trajectory and route of the cable from shore, which will in turn be used to guide cable route survey efforts out towards the 12nm limit.

## 2.3 Terminology and Definitions

| Abbreviation | Definition |
|---|---|
| AfL | Agreement for Lease |
| BGS | British Geological Survey |
| CLB | Cable Lay Barge |
| CLV | Cable Lay Vessel |
| HDD | Horizontal Directional Drill |
| LAT | Lowest Astronomical Tide |
| Mya | Million years ago |
| nm | Nautical Mile |
| ODN | Ordnance Datum Newlyn |

| Abbreviation | Definition |
|---|---|
| OS | Ordnance Survey |
| SNH | Scottish Natural Heritage |
| UKHO | United Kingdom Hydrographic Office |

Table 1: Abbreviations

# 3. DATA ADEQUACY REVIEW

## 3.1 Data Sources

The following data has been provided by Flotation Energy:

1. Greencat Renewables, Buzzard Offshore Wind Farm: Substation and Jointing Pits. Options Review and Field Report. C4642-1234 Version 1. August 2021.
2. Flotation Energy, Spatial data pack for Green Volt containing site-specific and open-source datasets, C1127G01_02_SpatialDataPack
3. Flotation Energy, Green Volt Development Area, Green_Volt_Dev_Area_WGS84_Z30N.shp
4. Flotation Energy, Indicative export cable corridor, Ettrick_Export_Buffer_v2_dis_WGS84_Z30N_1
5. Flotation Energy, Indicative HDD compounds, provided as individual shapefiles: Boddam Joining Point 1.shp, Boddam Joining Point 3.shp, Boddam Joining Point 4.shp, SF Joining Point 1.shp, SF Joining Point 2.shp, SF Joining Point 2.shp, SF Joining Point 3.shp
6. NorthConnect. HVDC Cable Infrastructure – UK Construction Method Statement. NCGEN-NCT-X-RA-0002. Revision 1, August 2018.
7. United Kingdom Hydrographic Office (UKHO), Admiralty Chart 2182C: North Sea – Northern Sheet
8. NorthConnect. Horizontal Directional Drilling (HDD) Feasibility Report. NCFFS-NCT-Z-RS-0001. Revision 0, August 2018.

The following data has been gathered by Global Maritime as part of this study:

9. British Geological Survey, Geoindex and Georecords Boreholes: NK14SW1017/E9, NK15SW3, NK15SW4, NK15SW5, NK14NW4, NK14SW16925-10,12,13
10. British Geological Survey, Geoindex, 1:250k Offshore Bedrock and Superficial Geological Mapping and 1:50k Onshore Bedrock and Superficial Mapping, https://map.bgs.ac.uk/arcgis/services/Offshore/Products_WMS/MapServer/WmsServer, (accessed 25/01/22)
11. British Geological Survey, 1:50 000-scale geological maps of Scotland (WMS), https://map.bgs.ac.uk/arcgis/services/BGS_Detailed_Geology/MapServer/WMSServer? (accessed 25/01/22)
12. National Library of Scotland, Ordnance Survey Aberdeenshire Sheet XXIII.SW, Edition of 1928
13. Environment Agency, LIDAR Composite DTM (1m resolution), updated 10th December 2021
14. United Kingdom Hydrographic Office (UKHO), HI1155 Todhead Point to Bosies Bank bathymetric survey, March – June 2009, https://datahub.admiralty.co.uk/portal/apps/webappviewer/index.html?id=1d001f91ed114a5996e953b5cdd62b06
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16. EMODnet, European Digital Terrain Model (DTM) of Europe, 2020 release, https://portal.emodnet-bathymetry.eu/

17. Royal Society for the Protection of Birds (RSPB), Important Bird Areas (IBA), RSPB_IBAs_2020_4326_210723
18. Royal Society for the Protection of Birds (RSPB), Reserves boundaries, RSPB_Reserves_Boundaries_20210625_m_27700_210723
19. Scottish Government, Gardens and Designed Landscapes, ScottishGovt_Gardens_and_Designed_Landscapes_m_2020_27700_270721
20. Scottish Government, Special Areas of Conservation, ScottishGovt_SAC_SCOTLAND_m_2020_27700__210622
21. Scottish Government, Conservation Areas, ScottishGovt_Conservation_Areas_m_2020_27700_27072021
22. Scottish Government, Special Protection Areas, ScottishGovt_SPA_SCOTLAND_m_2020_27700_210622
23. Scottish Government, Sites of Special Scientific Interest (SSSI), ScottishGovt_SSSI_SCOTLAND_m_2020_27700_210726
24. Scottish Government, Listed Buildings, ScottishGovt_Listed_Buildings_points_m_2020_27700_210727
25. Scottish Government, Scheduled Monuments, ScottishGov_Scheduled_Monuments_m_2020_27700_210727
26. Scottish Natural Heritage, RAMSAR, EUEV_SNH_RAMSAR_SCOTLAND_210506
27. Scottish Natural Heritage, Local Nature Reserves, EUEV_SNH_LNR_SCOTLAND_210506
28. Scottish Natural Heritage, Ancient Woodland Inventory (AWI), EUEV_SNH_AWI_SCOTLAND_210506
29. Scottish Natural Heritage, Geological Conservation Review Sites, EUEV_SNH_GCR_SCOTLAND_210506
30. OpenStreetMap contributors, Planet dump 25/01/22. Retrieved from https://planet.openstreetmap.org
31. Crown Estate of Scotland (CES), Energy Infrastructure Agreements, EUST_CES_Energy_Infrastructure_Agreements_220210

### 3.2 Data Adequacy and Gaps

Data adequacy, with regards the needs and perspectives of this study only, are summarised in **Error! Reference source not found.** below with commentary and a traffic light qualitative assessment.

| Data Type | Source | Comment | Adequacy |
|---|---|---|---|
| Project boundaries | [3], [4] | Boundaries provided for the wind farm area and indicative offshore export corridor. Onshore project boundary is still being defined and is therefore not required for this scope. | |
| HDD compound | [5] | Indicative compounds provided in shapefile format | |
| Bathymetry | [14], [15], [16] | UKHO "Todhead Point to Bosies Bank" survey at 4-8 m resolution covers the offshore study area from approximately 40 mLAT, and is | |

| Data Type | Source | Comment | Adequacy |
|---|---|---|---|
| | | therefore of limited use for the landfall assessment. The Boddam landfall is partially covered by ungridded UKHO bathymetric survey of the approaches to Peterhead from 2000. Nearshore areas are infilled with EMODnet bathymetry | |
| Elevation | [13] | 1m resolution LiDAR dataset from 2021 covers the entire study area | |
| Existing infrastructure | [2], [7], [30], [31] | Open source data on marine cables, pipelines and oil and gas infrastructure supplied in initial project data pack, cross referenced against admiralty charting.<br><br>Existing terrestrial infrastructure reviewed against OpenStreetMap. Subterranean assets have not been considered at this stage. | |
| Onshore Geology | [11] | High level geological characteristics, combined with existing BGS sample records where available, are seen as sufficient for this stage of development. Detailed site investigation is recommended at any preferred or potential onshore works locations. | |
| Offshore Geology | [10] | High level geological characteristics are seen as sufficient for this stage of development. Detailed site investigation is recommended at any preferred or potential HDD exit and entry locations | |
| Geotechnical | [9] | High level geological characteristics, combined with existing BGS sample records where available, are seen as sufficient for this stage of development. Detailed site investigation is recommended at any preferred or potential onshore works locations. | |
| Environmental designations | [2], [17], [18], [20], [21], [22], [23], [26], | Boundaries for designations provided in shapefile format | |

| Data Type | Source | Comment | Adequacy |
|---|---|---|---|
| | [27], [28], [29] | | |
| Cultural and landscape designations | [2], [19], [24], [25] | Boundaries and points in shapefile format | |

## 4. CABLE LANDING POINT REVIEW

Greencat Renewables have performed an onshore focussed study to identify potential onshore joint bay and substation locations [1]. This assessment has been based upon access, environmental and cultural constraints and existing onshore infrastructure.

The study has focussed on shoreline areas to the north and south of Peterhead in order to identify onshore jointing pits for the cables. These locations are briefly reviewed here, in addition to other coastline options, prior to assessment for feasibility from a construction and offshore engineering perspective.

### 4.1 St Fergus

In total, 3 potential jointing pit and HDD launch locations have been identified, south of St Fergus.

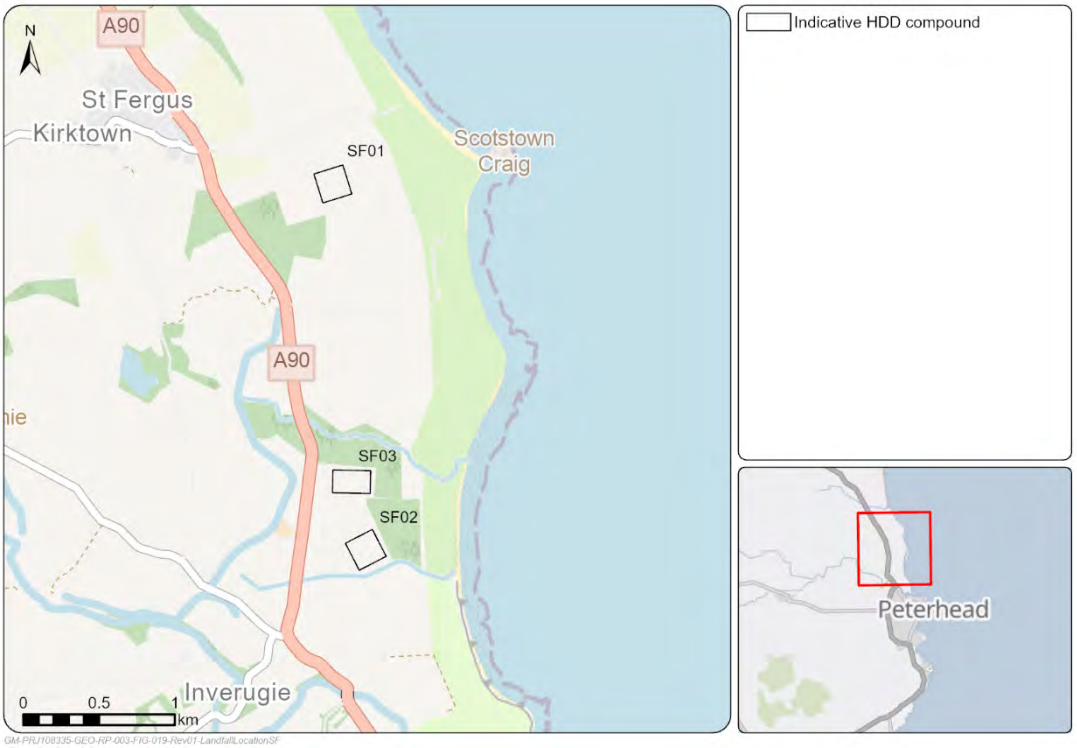


Figure 1: St Fergus Landfall Area

All three options provide for ample HDD compound areas on readily accessible arable land. The topographic elevation to be negotiated by HDD operations between launch and offshore exit are feasible, with a notable absence of significant cliffs. The identified jointing areas are positioned such that the HDD exit pit can be located significantly offshore, within the technical limits of what is generally considered with HDD. This provides for ease of construction vessel access and ensures that the cable exit at seabed is outwith the immediate nearshore high energy environment.

Other areas are constrained by existing land use and are not suitable, including otherwise favourable coastline at Craigewan Links due to the presence of a golf course.

## 4.2 NorthConnect Parallel

There is only one potential HDD launch location due to corridor length limitation for the NorthConnect Parallel alternative.

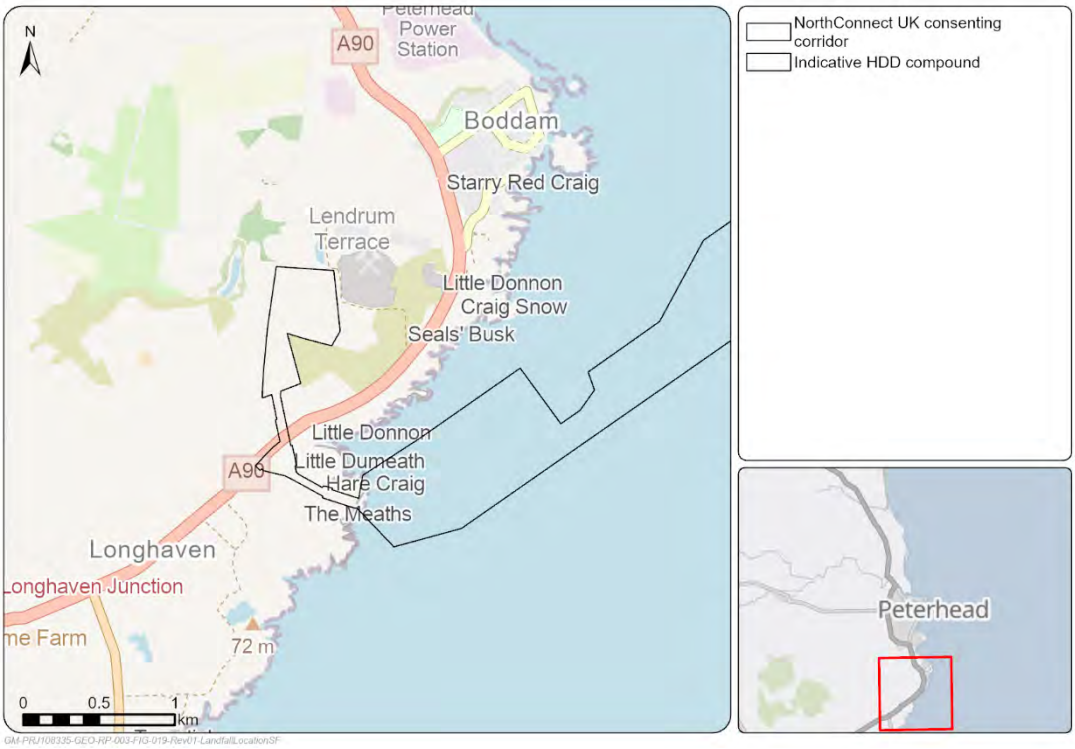


Figure 2: NorthConnect Landfall Area

The topography of the jointing area is dominated by steep coastal cliffs up to 55m high. However, the cliffs at the east side of the proposed HDD launch site are up to 25m high, with some of the shallowest gradients along this stretch of coastline. The cliffs are covered by SSSI, SPA, and SAC environmental designations. Therefore, HDD would minimise the environmental impacts on these areas. HDD is also a technically appealing option in this location due to its short length requirement to reach suitable water depths offshore for vessel access; and good access to A90 through two fields.

## 4.3 Peterhead

The town of Peterhead does not provide any feasible options for the launch of HDD operations, because of existing land use. Siting a HDD launch location immediately West of Peterhead would leave an infeasible HDD drill length.

## 4.4 Boddam and South

Boddam village, and the power station immediately North, occupies the land area between the A90 and the coastline. HDD launch areas within and immediately around Boddam are not possible because of residential land use.

To the north of Boddam is Sandford Bay, which was identified by Greencat as a potential landfall option due to its favourable physical characteristics [1]. Sandford Bay has subsequently been included in the planned Eastern Link 2 Agreement for Lease (AfL) boundary – a proposal to install a sub-sea high-voltage direct current (HVDC) cable from Sandford Bay, at Peterhead, to Drax in England – meaning additional cable landfalls in this area are now unlikely [31].

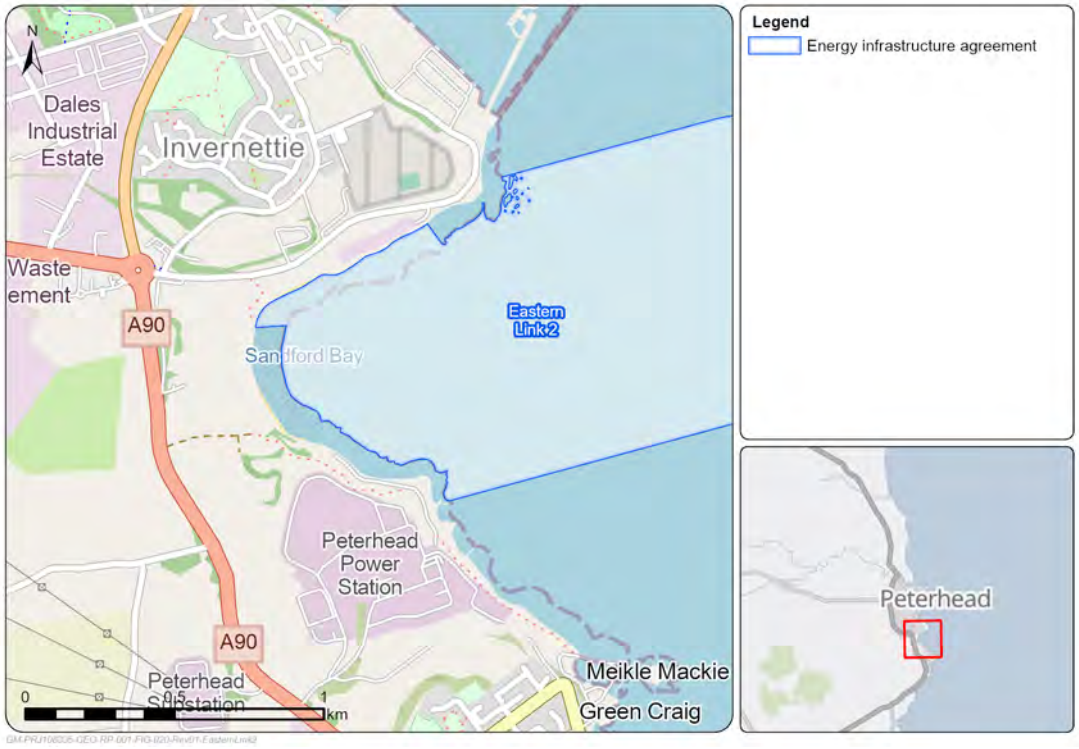


Figure 3: Eastern Link 2 Agreement for Lease at Sandford Bay

Further South, potentially suitable land for HDD launch areas exist between the A90 and the coastline but the coastline is attributed with a variety of designations including scheduled monuments (Boddam Castle), ancient monuments (Canmore), geological conservation review sites, SAC's, SPA's and SSSI's. Furthermore, the coastline is characterised by substantial cliffs which would add complexity to HDD engineering and design.

Other than the 'NorthConnect Parallel' option, the coastline South of Boddam is not deemed suitable.

## 4.5 Summary

The work performed by Greencat has identified potential jointing areas and HDD launch locations. Amongst these options, those at Boddam have been discounted, due to the subsequent planned and there are preferences from an engineering perspective amongst the remaining options.

Areas of coastline outwith those identified by Greencat do not provide viable opportunities for the launch of HDD operations and the jointing of cables, with the exception of the NorthConnect Parallel option, which is in addition to those identified by Greencat.

# 5. SITE CONDITIONS

## 5.1 St Fergus Option 1

### 5.1.1 Topography, Bathymetry and Land Use

The proposed jointing pit is located in a relatively flat field used for the grazing of cattle, immediately south of South Scotston farm buildings which also include a single residential dwelling. The jointing pit lies at an elevation of approximately 6mOD with the topography rising to 10mOD shorewards up to a noticeable break in topography, east of which the elevation falls towards the links and dunes systems at the coast where the topography once rises again into dune features.

Immediately East of the proposed jointing pit, along the probable HDD alignment, is indicated a telecommunication mast on OS mapping at grid reference NK11296 51791. A conventional mast is not present at this location which according to aerial photography is now a pond which is fenced off from surrounding fields. A further mast structure is indicated immediately adjacent to a road leading down to St Fergus Links at grid reference NK11033 52118. This latter location corresponds with a large security fenced compound, but no conventional mast is present. The nature of these mast features should be confirmed with a site walkover.

In the nearshore area, the seabed shelves gradually such that the 5mLAT bathymetric contour is reached 780m from the beach. Thereafter, the bathymetry deepens markedly, attaining 10m and 15mLAT at 1.0 and 1.18km from shore respectively.


Figure 4: St Fergus Option 1 Elevation


Figure 5: St Fergus Option 1 Aerial Imagery

### 5.1.2 Environmental Designations

The area is not subject to any environmental designations.

### 5.1.3 Cultural and Landscape Designations

The area is not subject to any cultural or landscape designations.

### 5.1.4 Geology and Geomorphology

The stratigraphic succession at the proposed HDD launch location comprises Quaternary lacustrine deposits overlying the Devensian Hatton Till Formation, underlain by rockhead comprising Semipelite, Pelite and Psammites of the Neoproterozoic Crinan and Tayvallich Subgroups.

Between the launch location and the shoreline, the uppermost soils transition through blown sand and a thin band of marine beach deposits which hug the coastline. Areas of Made Ground are also noted. Underlying these upper soils, are the same Hatton Till and metasediments as at the HDD launch location.

Between the proposed launch location and the existing coastline is a linear BGS feature denoting the presence of a palaeo shoreline.

At the shoreline, a rock outcrop is present and named Scotstown Head. Geological mapping shows the presence of Silurian granite and microdiorite dykes. These dykes, and associated offshoots, may be anticipated to be generally more prevalent in the immediate area.

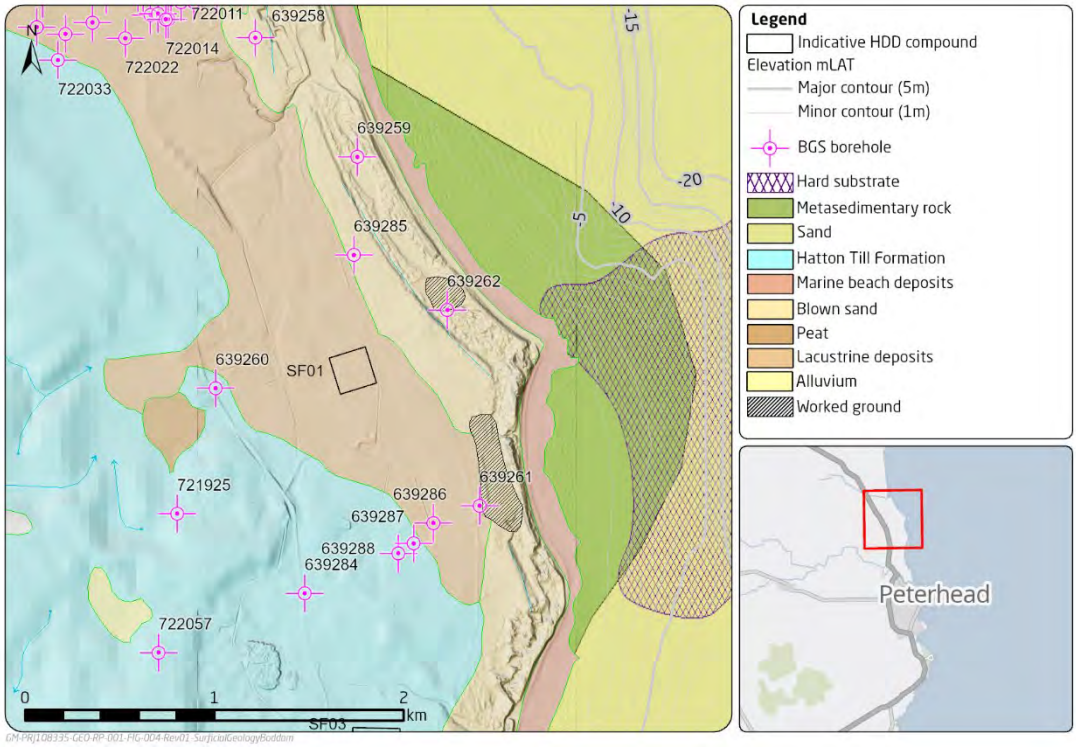


Figure 6: St Fergus Option 1 Superficial Deposits

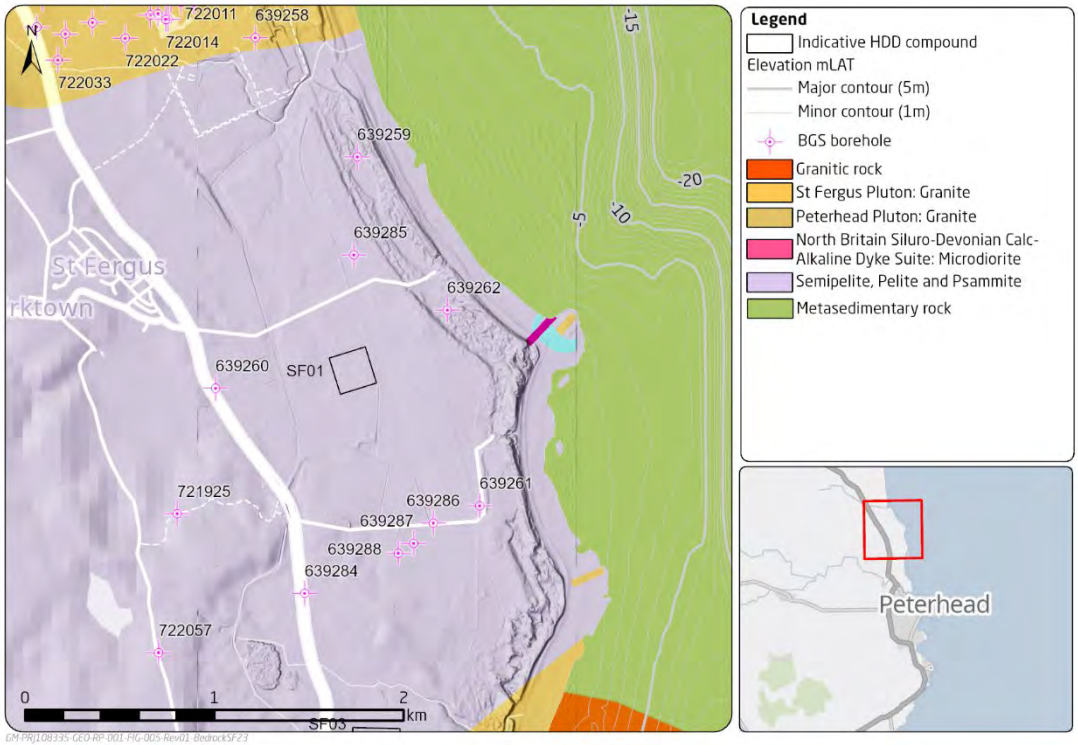


Figure 7: St Fergus Option 1 Bedrock

### 5.1.5 Geotechnical

Three geotechnical records from the BGS [9] bound the proposed launch location in a triangular formation (NK15SW3/4/5). Each of the geotechnical records are 500-1000m distant from the proposed HDD launch location.

Borehole NK15SW3, West of the launch location and adjacent to the A90, records 7.2m of glacial till (compact clay, sandy laminae, well rounded clasts) overlying glaciolacustrine deposits (laminated, clayey silt, well rounded pebbles) to borehole termination at 18.0m below ground level.

Borehole NK15SW4, 1km Southeast of the launch location, records 1.3m of blown beach sand overlying 9.5m of 'alluvium' (probably lacustrine) comprising clay with rare fine sand lenses and well rounded pebbles. Below this, the borehole enters glacial till typified by firm sandy clay with rare sand lenses and common angular to rounded clasts of a variety of igneous and metamorphic rocks.

Geotechnical record NK15SW5 is a simple pit, located 500m East-Northeast of the launch location. This recorded blown sand to 4.3mbgl, underlain by beach deposits (sandy gravel) to the base of the pit at 5.6mbgl.

The geotechnical records confirm the geological mapping but also disclose the presence of a glaciolacustrine deposit within the glacial till sequence. The recent and uppermost lacustrine deposits are anticipated to be normally consolidated, soft to firm, whereas the glacial till and associated internal glaciolacustrine unit may be anticipated to be normally to overconsolidated and generally stiff in consistency.

Sand lenses in both the lacustrine and glaciolacustrine units have the potential to contain overpressurised pore water, leading to flowing sand conditions. Hard clasts, up to boulder size, should be expected throughout the glacial till units.

The geotechnical records did not intersect the underlying rockhead. However, given the geological description, these rocks may be assumed to be moderately strong to strong, layered and with a low-grade metamorphic texture.

Figure 8 below depicts an idealised stratigraphy at the St Fergus 1 option location, determined with reference to the BGS records available. There is some significant uncertainty about the depth to principal stratigraphic interfaces, not least the depth to rockhead. Rockhead does exist in part at the Scotstown Head shoreline, at 0mOD, some 5-6m below the jointing pit elevation.

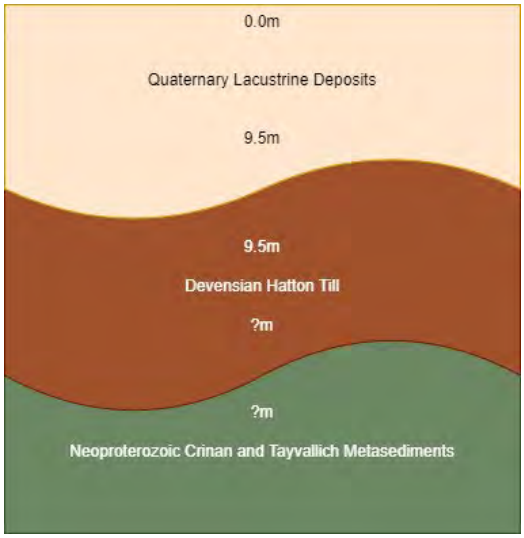


Figure 8: St Fergus Option 1 Idealised Stratigraphy

## 5.2 St Fergus Options 2 and 3

### 5.2.1 Topography, Bathymetry and Land Use

Option 2 and 3 jointing pit locations are situated immediately West of commercial forestry in open arable farmland, 290m and 150m East of the A90 respectively. Option 2 location is gently sloping to the South-Southeast and Option 3 is flat.

The topography shorewards is very similar to that of St Fergus Option 1 with a notable shore-parallel depression marking the palaeo-shoreline at the back of the current dune system.

A shallow seabed gradient results in the 5m bathymetry contour being reached approximately 630m from the shoreline, with the 10m and 15m contour reached at 1km and 1.4km respectively. Beyond the 15m water depth contour, the bathymetry increases markedly, gaining an additional 15m in water depth over 500m.

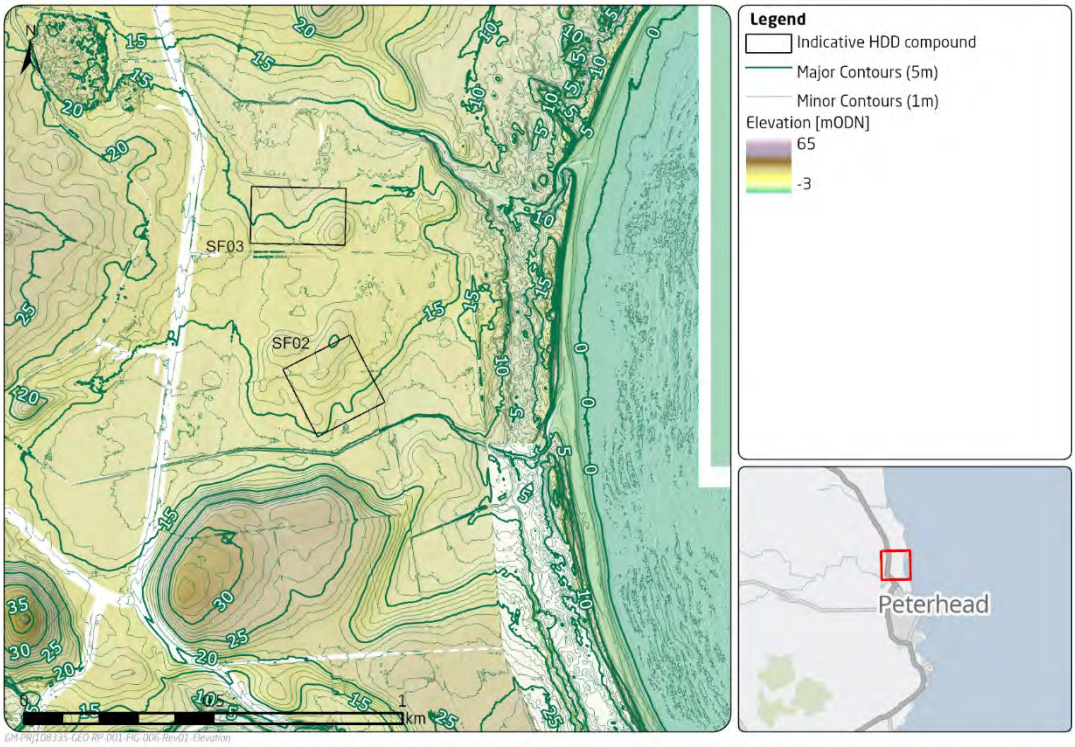


Figure 9: St Fergus Options 2 and 3 Elevation


Figure 10: St Fergus Options 2 and 3 Aerial Imagery

### 5.2.2 Environmental Designations

The locations of Options 2 and 3 are not subject to any environmental designations.

### 5.2.3 Cultural and Landscape Designations

The locations of Options 2 and 3 are not subject to any cultural or landscape designations

### 5.2.4 Geology and Geomorphology

The stratigraphic succession at these proposed jointing locations comprises the Hatton Glacial Till, underlain by bedrock. The solid geology in the vicinity of jointing pit options 2 and 3 are complex; the northernmost option 3 is located within the Neoproterozoic Crinan and Tayvallich Metasediments, whereas option 2 to the south is located at the intersection between the Forest of Deer and Peterhead Granite plutons.

Between the jointing pit locations and shore, the Peterhead Granite pluton subcrop extends northwards such that any HDD bore from these locations will intersect granitic bedrock.

The BGS Quaternary mapping [10] identifies a relict shoreline feature along the probable HDD path and corresponding with a shore-parallel topographic depression between the coastal dune system and farmland to the West.

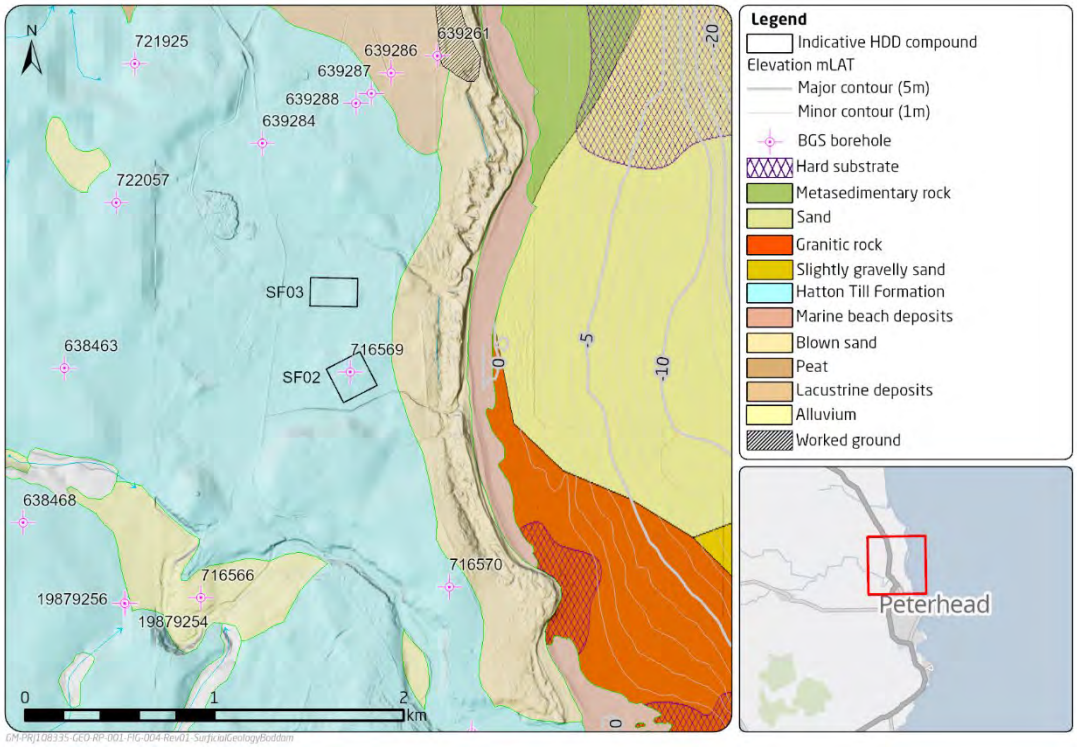


Figure 11: St Fergus Options 2 and 3 Superficial Deposits

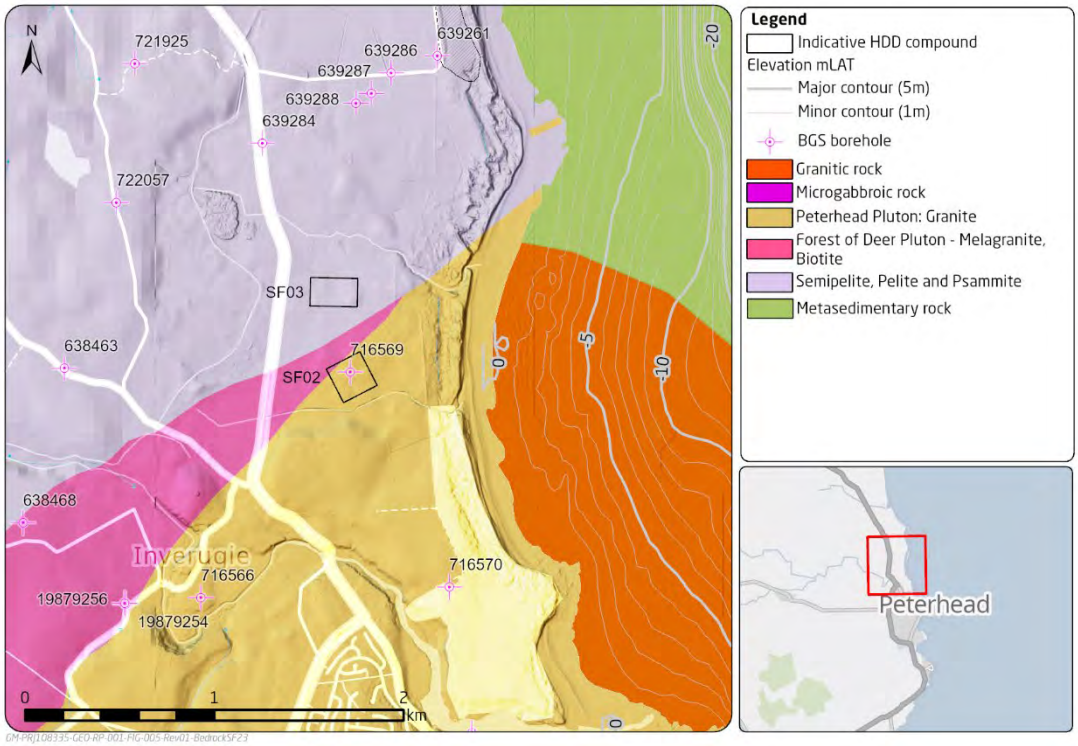


Figure 12: St Fergus Options 2 and 3 Bedrock

### 5.2.5 Geotechnical

One geotechnical record is available from the BGS [9] immediately adjacent to option 2; borehole record NK14NW4.

This borehole record discloses a succession of Hatton Till, including a glaciolacustrine sub-unit, from ground level to 10.9m. Rockhead is recorded at this level, comprised of the Caledonian Peterhead Granite pluton.

The Hatton Glacial Till is recorded as stiff sandy and silty clay, with clasts of igneous and metamorphic lithologies. The glaciolacustrine sub-unit is noted to be laminated and with bands of fine sand.

The granite was not penetrated substantially by the borehole. The granite was recorded as weathered, coarse grained and pink which is typical of the Peterhead Granite Pluton.

The Forest of Deer Granite, which is typically very biotite mica rich, has not been intersected by the geotechnical borehole.

The Option 3 location is indicated to be underlain by Semipelite, Pelite and Psammites of the Neoproterozoic Crinan and Tayvallich Subgroups [9], but to be very close to the contact with both the Forest of Deer and Peterhead Granites. This should be confirmed by site investigation.

The stratigraphy at the option 2/3 locations is presented in Figure 13 below.

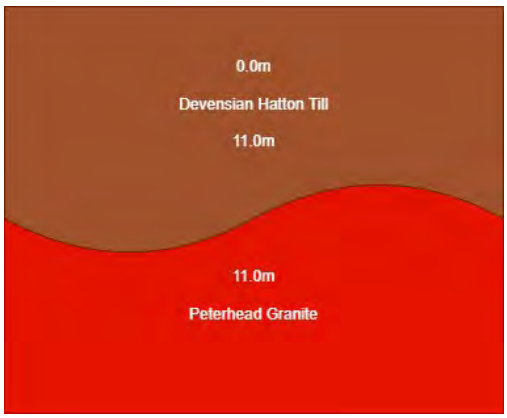


Figure 13: St Fergus 2 and 3 Stratigraphic Profile

## 5.3 NorthConnect Parallel

### 5.3.1 Topography, Bathymetry and Land Use

The topography of the jointing area is dominated by steep coastal cliffs up to 55m high. However, the cliffs at the east side of the proposed HDD launch site are up to 25m high, and form some of the shallowest gradients along this stretch of coastline. The potential HDD site is on gently sloping ground, at approximately 1 in 15, away from the A90 to the southeast. The gradient increases on the western edge as approximately 1 in 3. In contrast, the area is surrounded by the cliffs both to the north and south, which are near vertical with one section of the northern cliffs appearing to be undercut. [8]

A HDD in this location would benefit from reduced distance to reach the marine environment, and good access to A90 through two fields. The fields are mostly well drained with boggier areas around gates.

Gradient of the seabed between 0 and 5m LAT appears to be relatively shallow, with the 5mLAT bathymetry contour reached at 425 m away from the cliff. Beyond this, the water depth increases more rapidly with the 10m and 20m bathymetry contours being reached at 670m and 1080m from the cliff respectively.

The jointing area is grassed, probably used for grazing, and it is easily accessible through the gate, although the area around the gate is boggy. There is a slightly raised stony lineament in the middle of the area which might be an abandoned stone fence but there is no evidence on the historical mapping. The land is already permitted for HDD landing of the NorthConnect HVDC project and so benefits from this future planned land use.

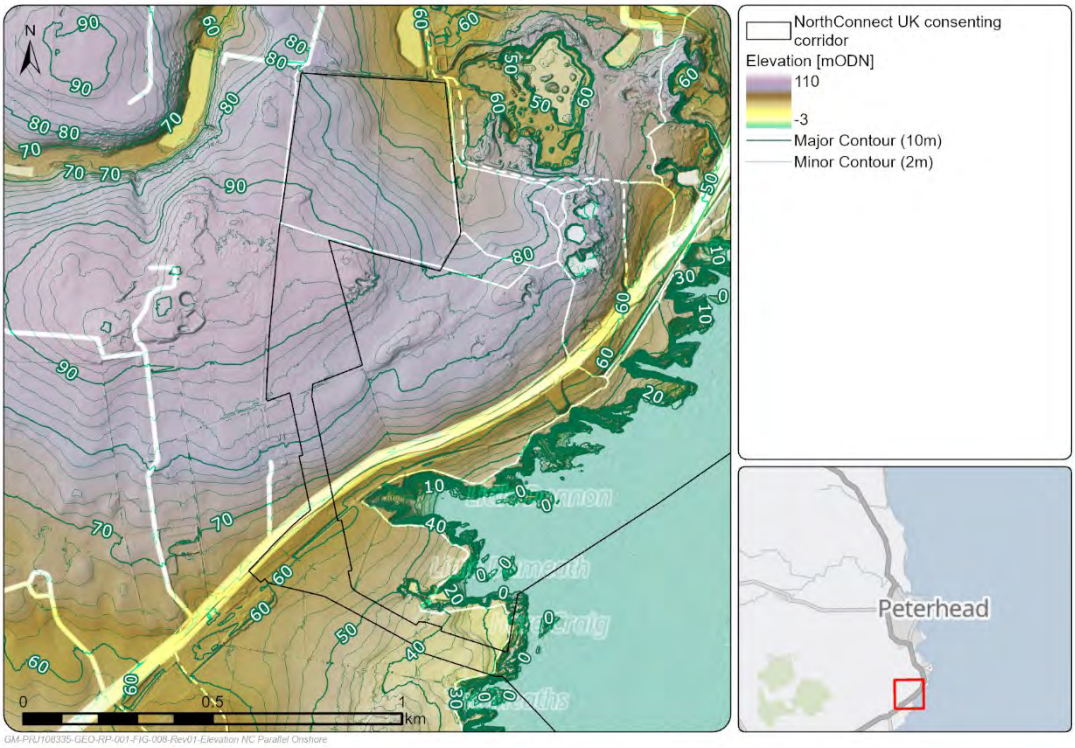


Figure 14: NorthConnect Parallel Onshore Elevation


Figure 15: NorthConnect Parallel Aerial Imagery

### 5.3.2 Environmental Designations

The Buchan Ness to Collieston Coast OSPAR Marine Protected Area bisects Longhaven Cliffs and extends to both the north and the south. The qualifying interest of this designation is through the support of large numbers of seabirds. Also, the Longhaven Cliffs are covered by SSSI, SPA, and SAC environmental designations.

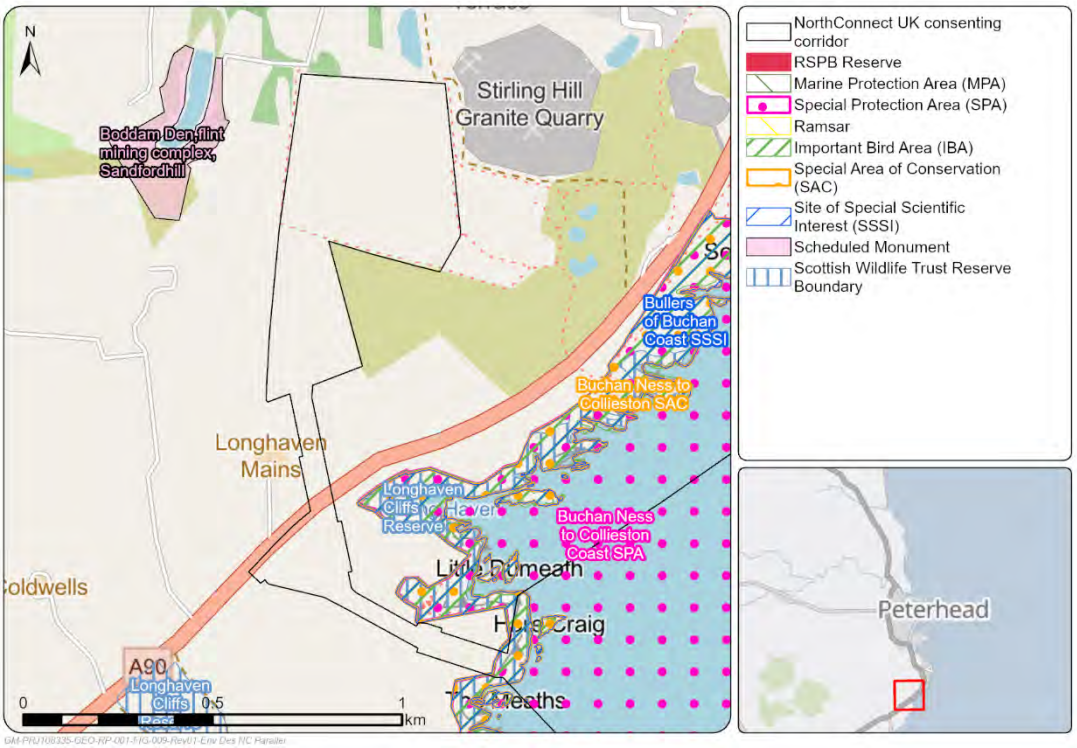


Figure 16: NorthConnect Parallel Environmental and Cultural Designations

### 5.3.3 Cultural and Landscape Designations

The proposed jointing area location is not subject to any cultural or landscape designations. However, there is a scheduled monument to the northwest of the compound.

### 5.3.4 Geology and Geomorphology

The proposed jointing location contains only a thin layer of superficial deposits which is expected to be 1-3 m thick over solid bedrock at the land side and thin loose Holocene sediments overlying dense sand and Glacial Till in the areas near potential HDD landfalls (marine side). BGS mapping indicates that the HDD site is underlain by Granite of the Peterhead Pluton and is of Silurian (416 – 444 Ma) age. The local soil profile is exposed at a number of places along the cliff edges and around the margins of the former quarry workings to the northwest of the HDD site. There are no specific geomorphological features noted in the area.

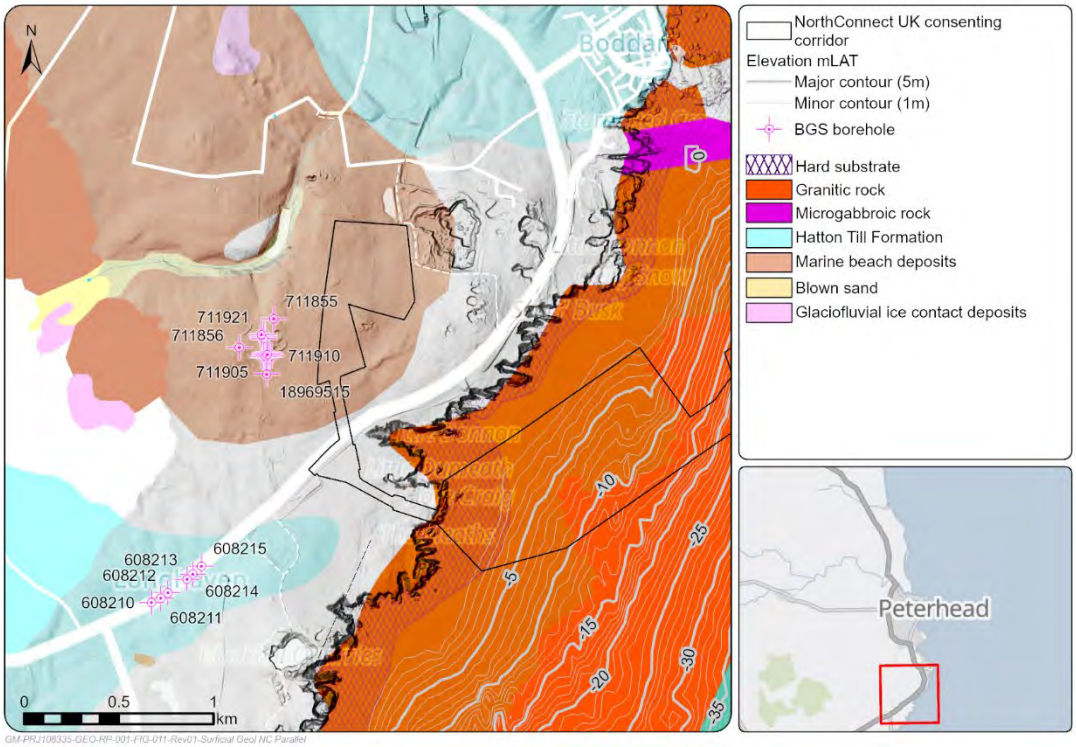


Figure 17: NorthConnect Parallel Superficial Geology

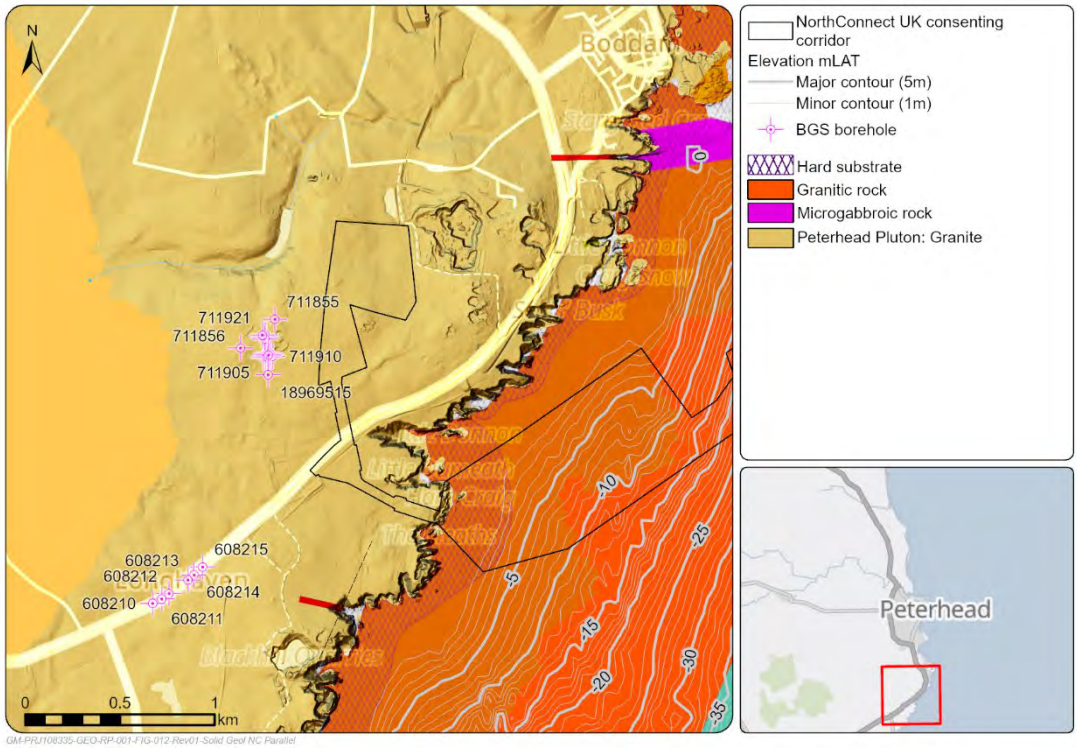


Figure 18: NorthConnect Parallel Bedrock

### 5.3.5 Geotechnical

Superficial deposits compromise of a thin (0.3 – 0.5 m) humic layer overlying silty SAND with Gravel. With depth, the gravel component is likely to increase in size and percentage as the soil transitions to rock. Towards the base of superficial deposits there are likely to be cobbles and boulders formed from weathered granite corestone.

BH201 indicates that the HDD locations will probably encounter soft slightly gravelly CLAY, with occasional boulders in the top 2 m of ground. Underlying this will be of cobbles and boulders of granite with some sand, representing a weathered profile, underlain by competent rock, with more highly weathered zones associated with jointing and faulting.

The Unconfined Compressive Strength (UCS) of the fresh granite is potentially 200Mpa or higher. Granite in the weathered fault zones might be as low as 40MPa depending on the degree of weathering.

An idealised stratigraphy is presented in Figure 19 below.

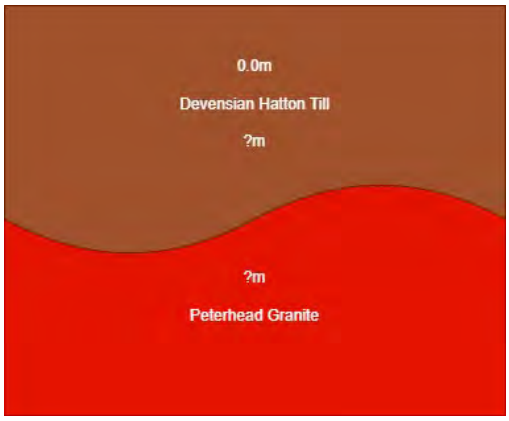


Figure 19: NorthConnect Parallel Idealised Stratigraphy

# 6. CABLE LANDING AND HDD FEASIBILITY

## 6.1 General

Both open-cut trenching and HDD (or other trenchless techniques such as Direct Pipe) may generally be considered as viable cable landing options. However, in the case of the Green Volt project, a combination of elevation change, shoreline land use and habitat considerations means that open-cut trenching is not viable.

### 6.1.1 Horizontal Directional Drilling (HDD)

HDD methods are the most common trenchless method and involve installing a steel or plastic (high density polyethylene) conduit in individual or parallel HDD installations. This method of construction is typically used to install pipes and conduits in areas not amenable for trenched construction, including water bodies, highways, railroads, runways, environmentally sensitive areas, and shorelines/landfalls. Assuming proper design and good HDD construction practices, the HDD method allows for the installation of subsea cables at shore landing, with minimal impact to the surrounding environment.

The installation methodology of a cable by HDD can be summarised by three primary stages:

1) Creating a Pilot Drill – A steerable drill bit creates a pilot hole along the pre-determined trajectory from the launch site, which is generally sited onshore. Steering is computer controlled by a surveying tool on the drill string behind the drill bit. Drilling mud is pumped in to lubricate and cool the drill bit and remove cuttings. Steel casing will likely be required for the first section of the bore in order to hold the bore open effectively for the multiple passes required for drilling and reaming.
2) Reaming – Successively bigger reamer tools are attached into the drill pipe (which runs continuously through the hole with pipes added/removed at each end) and passed along the bore to enlarge the hole to the required diameter, with cuttings removal and hole support supplied by bentonite slurry.
3) Installing a Duct – The duct is pushed through the completed and cleaned hole by pushing it through from the launch point, or in some cases where onshore space is limited, from the offshore site by pulling a prefabricated duct into the landfall though the bore by the drilling machine and drill string. The duct will be sealed with a messenger wire in place and made stable on seabed with mattresses or rock bags temporarily until the cable product can then be pulled though the completed duct.

The above HDD installation methodology is well known, with several contractors across the industry with the required installation experience. From this experience, it is documented that there are three major considerations for HDD operations, notably length, curvature and elevation change across the bore, to be regarded. As these increase the pull force required to pull the duct though the completed hole increases. Pull force is limited by both the HDD equipment and the tensile strength of the duct before damage occurs, although it is possible to mobilise specialist jacking systems to push-jack the conduit into the entry hole. Drill and reaming forces can be potentially reduced by conducting some or all the HDD operations from an offshore jack-up barge, albeit increasing expense significantly.

The depth of cover for a given HDD installation is dependent on several factors. Of these factors, the most important include the properties of the overlying geotechnical materials, the resistance these materials provide to the required installation-induced drilling fluid pressures, and spatial or clearance requirements between the HDD bore and existing utilities and structures. Horizontal curves can be incorporated into the bore profile to align the installation to avoid buildings and structures if present between HDD pit and shoreline. The angle of the required deflection should be kept as small as possible.

It should be noted that maximum installation length is anticipated to be 1.5 km due to typical limitations associated with cable and duct pull in requirements, though this may vary project-to-project. Some long HDDs have been completed in the offshore industry of up to 2 km, and up to 5 km in exceptional circumstances onshore with large, 400Te rated HDD rigs.

### 6.1.2 Trenchless Installation Considerations

*Water Depth at Punch-Out*

For this assessment, an exit point (punch out) of the bore at the -5m LAT line offshore was initially assumed, a depth of water in which most cable lay barges (CLB) can operate. Given the bathymetric profile along this section of coast, standing a deeper draft cable lay vessel (CLV) off at the -10mLAT contour and floating a cable into the HDD duct is also considered viable.

Considering punch out at -5mLAT will mean shorter bores, and cost and time savings. Given the bathymetric profile and the ability to stand-off a CLV at a relatively short distance, this approach is considered for the project as it de-risks the HDD completion. However, some additional cost may be anticipated to be passed on to the cable installation works, in terms of using specialist CLB's, or additional effort in managing a cable float-in.

The potential for longer HDD's is not discounted at this stage, which could achieve punch-out in -10mLAT water depth, enabling a CLV to directly access the HDD exit point for cable pull in. Such approaches introduce additional risk and cost to the HDD operations which may not be necessary. More detailed assessments with project-specific bathymetry and ground data will enable a judgement to be made.

*Thermal Considerations*

The Thermal properties of the ground containing a buried cable are a significant consideration to avoid overheating damage. Thermal conductivity and heat capacity of the surrounding soil, overburden thickness, the presence or absence of cooling groundwaters and the ability of groundwaters to circulate to remove heat are all factors.

Liaison with HDD / Direct Pipe contractors is required to determine the minimum cover depths for installation operations given the anticipated geology. Conversely, should the bore profile be restricted by soils then heating concerns need to be considered with respect the cable conductor size and in the worst case an oversized conductor might be required for the bore section.

*Site Requirements*

The landfall site must be designed to comprise the jointing pit and HDD operations for two export cables. For a typical large HDD installation involving the installation of a single conduit, the staging area for the entry side of the crossing is recommended to be approximately 100 m by 60 m. For multiple conduits, such as required here, the width of the staging area needs to be increased to accommodate each entry location. For the two required conduits, with a horizontal separation of 20 m, the shore-parallel dimension of the compound is likely to increase to 70-80m.

Maintaining a shore-perpendicular dimension of the compound at 100m enables more efficient pipe handling and build out in longer length. Available land, and associated landuse, landward of the HDD compound should also be considered. If very long HDD's are required, it is likely that the ducting would need to be pushed in from the launch pit in large, continuous lengths of several hundred metres at a time. Site layout needs to be considered to potentially permit this arrangement. Figure 20 below depicts a potential site layout for two HDD rigs.

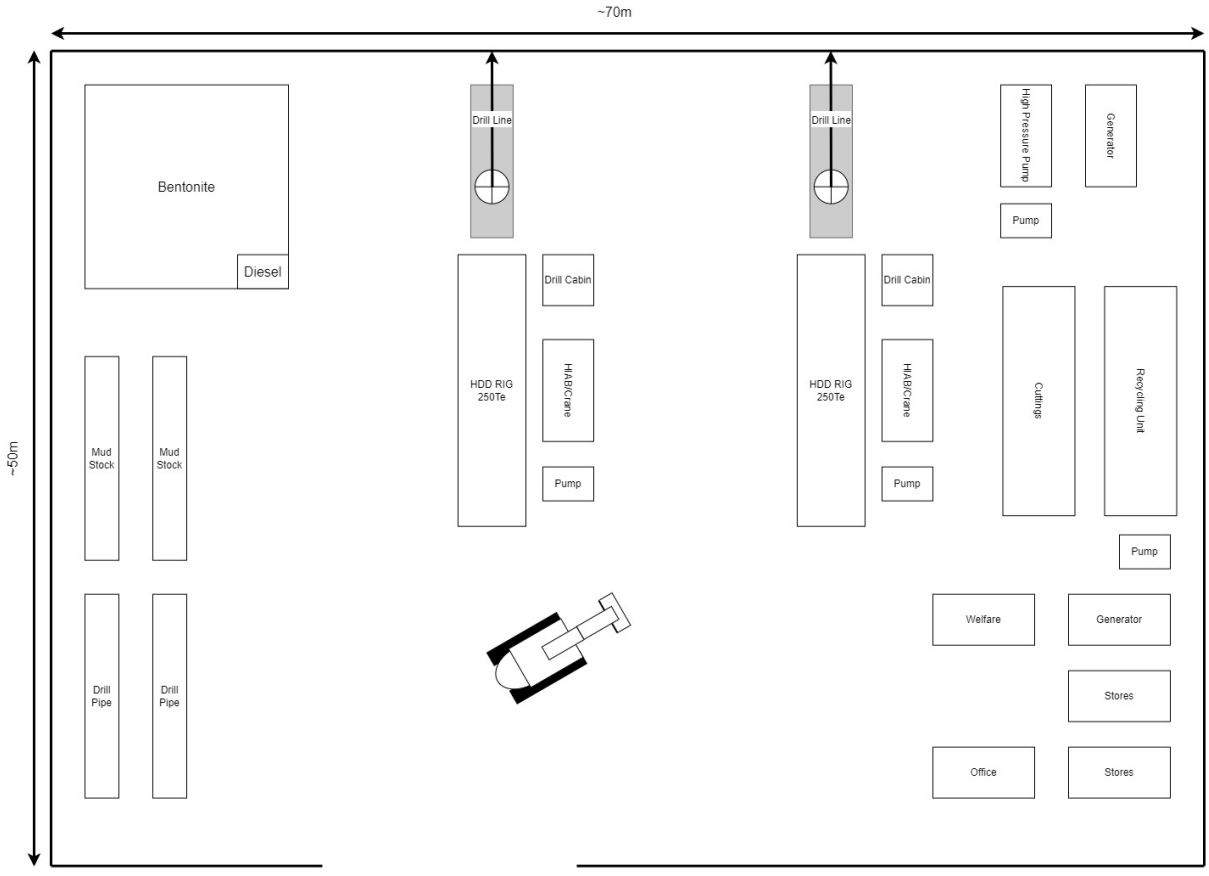


Figure 20: Potential HDD Site Layout

*Cable Spacing*

Detailed routing and definition of cable spacing is subject to route specific geophysical and geotechnical survey.

After exiting the HDD bore, cables should attain a minimum separation of 50 m within the export cable corridor. Ideally, this separation should be 75-100m to allow for ease of

IMR activities. In the nearshore section (e.g., at the bore exit), the separation can be reduced to approx. 35 m for the individual punch outs. This is to give sufficient working area on the seabed around the duct, and not cause any inefficiency, however that should be reviewed.

As the cables approach landfall via HDD ducts and reach the jointing bay area (e.g., at the entry points), the separation can be further reduced to approx. 20m. Again, largely led by the requirement for working area around the drill entry points and the eventual pad for the landfall joint.

The above constraints will need to be accommodated with a detailed RPL during a full routing exercise following common practice rules such as minimum curvature radius.

## 6.2 St Fergus Option 1

*Site Area*

The site area is within flat farmland with good access from the A90. The jointing bay location itself is of ample size to accommodate the HDD operations. Inland of the jointing bay location, there is a further 300m of open farmland which could be secured for longer lengths of conduit piping to be set up and handled into the HDD.

The site area is suitable for HDD drilling and jointing pit operations.

*Drill Length and Trajectory*

In order to reach the -5mLAT depth contour, a drill length of approximately 1.3km is required, within the capabilities of widely available HDD drill rigs in the market. At the upper bound of conventional rig capabilities, the -10mLAT contour may also be reached with a drill length of approximately 1.5km.

The site area lies at an elevation of 6mOD, giving an approximate elevation change of 11m from entry to exit pit. This is not problematic over the planned drill length.

*Onshore Geological and Geotechnical Conditions*

Post-glacial lacustrine deposits are expected at surface, at perhaps up to 10m thickness. This unit is likely to require casing, due to it's less consolidated nature and presence of sand lenses which are likely to contain overpressurised water. The casing length is likely to be in the order of 60-70m may be expected.

Underlying the lacustrine deposits are glacial tills. These soils are anticipated to be generally stable in the HDD bore, although are likely to contain boulders of igneous and metamorphic origin.

Rockhead exists at the shoreline, but has not been intersected by any local boreholes. It may therefore be anticipated to be present along the HDD bore. The metamorphic rock is likely to be strong and competent, forming a stable bore, but the rock structure, including joints, faults and metamorphic texture should be investigated in detail to determine the potential for hydrofracture. Igneous dykes are present in the immediate vicinity and should be anticipated within the trajectory of the HDD bore. These dykes are likely to be stronger than the metamorphic country rock, but may also have generated preferential fluid pathways leading to zones of enhanced weathering.

The geological and geotechnical conditions require careful consideration at this location but are not considered particularly problematic for a well planned and executed HDD operation.

*Nearshore Geological and Geotechnical Conditions*

The immediate nearshore area is characterised by intermittent soil cover and large areas of exposed rock at seabed. Burial potential is anticipated to be extremely limited within the rock which will be difficult to cut, even with a mechanical trencher. To maximise the chances of attaining cable protection through burial, the cable route centreline must be deviated to the north, around an area of mapped rock at seabed. This results in a constrained route, aligned closely to the Fulmar to St Fergus pipeline.

The nearshore geological constraints result in a longer cable route and limitations to cable burial potential. As a result of these factors, St Fergus Option 1 may be considered unfavourable.

## 6.3 St Fergus Option 2 and 3

*Site Areas*

The site areas are within arable farmland with good access from the A90 at Lunderton Cottages. Option 3 area is relatively flat, with a small incline of 3-4m in the southeast corner. Option 2 area occupies a shallow, South-Southeast dipping slope of 1.5°. Inland of both options, there is a significant amount of open farmland available which could be used for handling longer conduit lengths.

Both site areas are suitable for HDD drilling and jointing pit operations.

*Drill Length and Trajectory*

In order to reach the -5mLAT depth contour, a drill length of approximately 1.1km and 1.3km is required for Options 2 and 3 respectively, within the capabilities of widely available HDD drill rigs in the market. At the upper bound of conventional rig capabilities, the -10mLAT contour may also be reached with a drill length of approximately 1.6km.

The site areas lie at an elevation of approximately 18mOD, giving an approximate elevation change of 23m from entry to exit pit. This is not problematic over the planned drill length.

*Onshore Geological and Geotechnical Conditions*

Both options lie within an area of Hatton Glacial Till at surface. This glacial till is anticipated to continue to rockhead, but to be quite heterogenous, incorporating minor sand lenses, glaciolacustrine layers and significant boulders. Whilst the glacial till is anticipated to form a relatively stable bore overall, sand lenses with high pore water pressure has the potential to cause bore collapse and instability. Boulders will cause slower drilling progress. Both of these factors should be considered in drilling and drill fluid design.

Rockhead is encountered in the vicinity at 11.0m below ground level, comprising Peterhead Granite where it is intersected by a borehole [9]. In the area more generally, rockhead is comprised of the Peterhead Granite, Forest of Deer Granite and Semipelite, Pelite and Psammites of the Neoproterozoic Crinan and Tayvallich Subgroups [9]. The exact nature and relationship of these rock types should be confirmed with site survey. Whilst the rock types anticipated should form a clean and stable HDD bore, the nature of weathering and contact metamorphism effects should be confirmed, in addition to the potential for any preferential fluid flow pathways through faults or contact between the different rock types.

The onshore geological and geotechnical conditions are not anticipated to cause any problems for a properly planned and executed HDD operation.

*Nearshore Geological and Geotechnical Conditions*

The nearshore area exists immediately to South of a mapped rock outcrop at seabed. The seabed itself is indicated to comprise of Forth Formation, underlain by Wee Bankie Formation. The nearshore area exists inside of the 10m Quaternary depth contour, and so soil cover may be expected to be limited. Rockhead is likely to comprise Peterhead Granite in the immediate nearshore area, with negligible burial potential.

Some burial potential is therefore afforded in the nearshore area, which may be considered favourable for St Fergus Options 2 and 3. It will be important to quantify the thickness of soil cover and burial potential with route specific geophysical and geotechnical survey.

## 6.4 NorthConnect Parallel

*Site Areas*

Site area is located between A90 and Longhaven Cliffs. Access to the site is from the A90 through two fields. The fields are mostly well drained with boggier areas around the gates. They are likely to provide good access once topsoil has been stripped and laid with geofabric and hardcore or gravel. Potential locations of HDD crossings beneath the A90 and the former railway are located approximately 500 m inland from the landfall location.

The HDD site area is located mostly level ground, there is only a gentle slope to the east, at approximately 1 in 15. The western edge of the potential site is formed by steeper slope of approximately 1 in 3. [8]

Potential HDD alignments should balance the available depth of cover beneath the intertidal/gutter of nesh area, maintaining a sufficient lateral distance from the cliffs south of the site, alignment for onward cabling toward the substation, and favourable conditions at the marine exit point.

*Drill Length and Trajectory*

The proposed NorthConnect HDD design is 409.10m in length, with entry elevation approximately +38m ODN and exit elevation -28m ODN (26m below LAT). The entry angle is 17° in order to maximise the depth beneath the coastal land, which is at the upper end of normal HDD rig setup angles. It is intended to ensure depth is reached as

quickly as possible, reducing the overall length of the HDD, achieving an adequate depth of cover and maintaining a angle close to that of the cliff profile.

The exit point is chosen to keep the HDD length to a minimum as well as exit at a suitable angle for duct installation and onward cabling. Also, the vertical curve radius of 400m is within the limits of both the drilling equipment and the expected ducts. [8] These approaches and strategies are reasonable and could be adopted for the Green Volt HDD landing.

*Onshore Geological and Geotechnical Conditions*

The site contains only a thin layer of superficial deposits. It is expected to be 1-3 m thick over solid bedrock and potentially up to 5 m depth above weathered shear zones.

In the field there is expected to be a thin (0.3 - 0.5m) humic layer overlying silty SAND with gravel. With depth, the gravel component is likely to increase in size and percentage as soil transitions to rock. Towards the base of the superficial deposits there are likely to be cobbles and boulders formed from weathered granite corestone, representing a weathered profile, underlain by competent rock, with more highly weathered zones associated with jointing and faulting.

Results from BH201 indicate that the HDD locations will probably encounter soft sandy slightly gravelly CLAY, with occasional boulders, in the top 2m of ground. Underlying this will be 4m of cobbles and boulders of granite with some sand. The geophysical information from Resistivity Line 1 matches the results from BH201.

*Nearshore Geological and Geotechnical Conditions*

The MMT 2016 LOTA marine geophysical and geotechnical survey [8] identified a sequence of thin loose surficial Holocene sediments (silt sand and gravel) overlying dense sand and Glacial Till in the areas near potential HDD landfalls. At the probable HDD exit points, the Holocene sediments are identified as silt and fine sand, while in the centre of the survey area near the shoreline it is identified as sand and gravel with ripples. Additionally, BGS mapping indicates that the HDD site is underlain by Granite of the Peterhead Pluton and is of Silurian (416 – 444 Ma) age.

It should be noted that the continuation of the granite offshore is an assumption; there is no direct evidence of the bedrock material beyond Hare Craig. However, locally there are granite outcrops offshore (e.g., Skerry Rock, 500m offshore from Boddam) and the BGS offshore index mapping shows the granite bedrock extending to 1.75km from shore. Granite continuing to the possible HDD exit location 250m from the shoreline is therefore considered to be very probable.

## 6.5 Summary

The landfall locations proposed have been comparatively evaluated and are summarised in Table 2 below.

| Option | Onshore Geo | Offshore Geo | Drill Length | Site and Constraints | Overall |
|---|---|---|---|---|---|
| St Fergus 1 | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| St Fergus 2 | | | | | |
| St Fergus 3 | | | | | |
| NorthConnect Parallel | | | | | |

Table 2: Landfall Suitability Summary

St Fergus 1 requires a circuitous route to avoid nearshore rock outcrops and the targeted areas of nearshore seabed soils may also not offer reliable burial potential.

St Fergus 2 and 3, and the NorthConnect Parallel option, all offer viable and attractive opportunities for cable landing based upon the information available to this study.

## 7. CONCLUSIONS

Proposed jointing bay and HDD locations have been proposed by Flotation Energy and assessed by Global Maritime from a practicality, constraint and technical feasibility perspective. Each of the sites have been considered separately, although reported together where appropriate.

All potential landfall sites are considered feasible, although with their own particular considerations.

St Fergus 2 and 3 are favoured landing point options, because of the negligible topography, favourable geological conditions and attainable HDD drill length. These options also permit a relatively direct route offshore towards the 12nm boundary. NorthConnect Parallel is also feasible, with a shorter HDD drill length, but greater elevation difference to account for in HDD design. The offshore route for NorthConnect Parallel would seem to offer some burial potential but is less direct than that of St Fergus 2 and 3. The NorthConnect Parallel option does offer the benefit of being located adjacent to the NorthConnect planned HDD, which is already permitted. It is felt that this may alleviate some of the concerns around environmental and cultural designation constraints in this area.

At this stage, the project may continue to consider these sites in parallel, maintaining a plurality of options and thus managing landfall risk.

Other jointing pit and HDD locations may also be considered in future, for example to the immediate west of the golf course, to the south of St Fergus 2 and 3. These options can be considered in future and should be accounted for in any planned offshore survey campaigns.

# APPENDICES

**APPENDIX A BGS BOREHOLE RECORDS**

# APPENDIX A BGS BOREHOLE RECORDS

## A.1 St Fergus Option 1

Institute of Geological Sciences
IMAU Sand and Gravel Borehole Log Form

| NK 15 SW 3 | NK 1010 5160 | North Kirkton Farm, St Fergus | Block |
|---|---|---|---|

| Surface level | +7.0m (+23 ft) |
|---|---|
| Ground water level +2.0m | |
| 250mm and 200mm percussion | |
| September 1977 | |

| Waste | 18.0+ |
|---|---|

LOG

| Geological Classification | Lithology | Thickness m | Depth m |
|---|---|---|---|
| | Soil | 0.3 | 0.3 |
| Till | Clay, red to red-brown, mottled in parts, compact, with sandy laminae and clasts of well rounded granite and platy schist | 6.9 | 7.2 |
| Glaciolacustrine deposits | Silt, clayey, micaceous, laminated, grey-brown to red-brown, with rare well rounded pebbles of granite | 10.8+ | 18.0 |

...G Sand and Gravel Borehole Log Form

| | | | |
|---|---|---|---|
| NK 15 SW 4 | NK 1149 5097 | North Kirkton Farm, St Fergus | Block E |

| | |
|---|---|
| urface level | + 10.8 m (+35 ft) |
| round water level +9.9 m | |
| 50 mm and 200 mm percussion | |
| eptember 1977 | |

| | |
|---|---|
| Overburden | 0.2 |
| Mineral | 1.3 |
| Waste | 15.0+ |

LOG

| ological Classification | Lithology | Thickness m | Thickness ft | Depth m | Depth ft |
|---|---|---|---|---|---|
| | Soil, sandy, dark brown | 0.2 | | 0.2 | |
| Blown sand | Sand | 1.3 | | 1.5 | |
| | Sand: fine to medium, subangular to subrounded, quartz with feldspar and shell fragments, beige | | | | |
| ake alluvium | Clay, mid-grey, mottled in part, with rare fine sand lenses and rare well rounded pebbles. | 9.5 | | 11.0 | |
| Till | Clay, sandy, grey-brown, with angular to rounded clasts of basic igneous and metamorphic rocks and quartz | 2.5 | | 13.5 | |
| | Clay, firm, reddish brown, with common angular to subrounded clasts of pink granite and metamorphic rocks. | 2.3 | | 15.8 | |
| | Clay, sandy, grey-brown, with clasts of gneiss becoming common towards base. | 0.7+ | | 16.5 | |
| | Borehole abandoned due to slow progress in stony till | | | | |

IMAU Sand and Gravel Borehole Log Form

| | | |
|---|---|---|
| NK 15 SW 5 | NK 1132 5200 | St Fergus Links Sand Pit, St Fergus Block E |

| | |
|---|---|
| Surface level | + 7.2m (+ 24 ft) |

Water struck at + 1.8m

Sampling by hand

May 1978

| | |
|---|---|
| Overburden | 0.3 |
| Mineral | 5.3+ |

LOG

| Geological Classification | Lithology | Thickness | Depth |
|---|---|---|---|
| | | m | m |
| | Soil, peaty | 0.3 | 0.3 |
| Blown sand | a) Sand: medium with some fine, subrounded, quartz, yellow | 4.3 | 4.6 |
| Post-Glacial Beach deposits | Sandy gravel, with pebble band at top<br>Gravel: cobble and coarse with fine, well rounded, gneissose rocks, felsite and shells<br>Sand: medium with some fine and coarse, sub- to well rounded, quartz and shell, yellow-orange | 1.0+ | 5.6 |

## A.2 St Fergus Options 2 and 3

MAU Sand and Gravel Borehole Log Form

| NK 14 NW 4 | NK 1103 4930 | Lunderton Farm, Peterhead | Block D |
|---|---|---|---|

| Surface level | +18.4 m (+60 ft) |
|---|---|

Water not struck

250 mm and 200 mm percus sion

November 1977

| | |
|---|---|
| Waste | 10.9 |
| Bedrock | 0.3+ |

LOG

| Geological Classification | Lithology | Thickness m | Thickness ft | Depth m | Depth ft |
|---|---|---|---|---|---|
| | Soil, clayey, grey-brown | 0.4 | | 0.4 | |
| Till | Clay, mottled, red-brown, becoming stiff at depth, with subangular to subrounded clasts of granite, schist and quartz | 3.8 | | 4.2 | |
| Glaciolacustrine deposits | Silt, clayey, sandy at top, red, stiff in parts, with bands of fine sand and red-brown laminated clay | 3.8 | | 8.0 | |
| Till | Clay, sandy, greenish grey, with numerous clasts, often well rounded, of quartz, schist and weathered granite. | 2.9 | | 10.9 | |
| Caledonian | Granite, weathered, coarse, ~~grained~~ crystalline, pink | 0.3+ | | 11.2 | |

GREEN VOLT

# Appendix 5.1

## Construction Execution Plan

Onshore EIA Report: Volume 3

# Construction Execution Plan

In accordance with ISO14001:2015, ISO9001:2015 and ISO45001:2018


| | | |
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## CONTENTS

# 1 INTRODUCTION

## 1.1 STOCKTON INTRODUCTION

A privately owned Limited company which has been trading for over 17 years in the construction industry, specialising in Oil, Gas and Renewables providing turnkey solutions for onshore and near shore projects that require trenchless and open cut installations of outfalls and landfalls. Head office is based in Wakefield (West Yorkshire) and our plant yard is based in Barnsley (South Yorkshire), 10 miles from our Head Office. We operate predominately throughout the UK and Europe.

We permanently employ a highly motivated and technical team of individuals, ensuring we have continuity of competent and experience and technical "know how". We have successfully completed many major and complex projects and have had the opportunity to work alongside some fantastic clients: Shell, Eon, BP, Wessex Water, SSE, Scottish Water and many more. Complex HDDs, onshore and offshore, drilling distances from 200m to 2000m, pipe diameters from 100mm to 1200mm. Steel and HDPE pipeline installations from 100m to 4000m.

Most recently we successfully completed the landfall installation of the Tolmount gas export pipeline into Easington Gas Terminal, this was installed using a mixture of open cut techniques into the nearshore zone and micro tunnel underneath the terminal.

We are very proud of our Achilles scoring across all scopes averaging over 95%, with a 100% pass-rate in 2017, 2018, 2019, 2020, 2021 and 2023 demonstrating Stockton's commitment to Safety, Quality and the Environment. To date in 2023 we have obtained our CHAS Elite and Supply Chain qualifications signifying our continued pledge to our company policies.

## 1.2 PROJECT INTRODUCTION

Green Volt Offshore Windfarm is being proposed as the first major step towards the goals of the UK North Sea Transition Deal, a sector deal between the oil and gas industry and UK government, signed in March 2021. This Deal recognises that oil and gas will continue to play an essential role in our energy supply as part of the transition towards Net Zero and that it is, therefore critical, to reduce the CO2 emissions generated by offshore oil and gas production from the earliest possible time point, with a minimum reduction of 50% by 2030. To be operational by 2026, Green Volt offers the opportunity to mitigate 500,000 tonnes of CO2 per year.

Generated power will be exported by means of a subsea cable that will landfall on the Easy Scottish coast north of Peterhead, before heading west to a new sub-station to be built at New Deer. It is understood that the offshore to onshore cable transition will be located on the coast at the Landfall site, north of Peterhead. The onshore cables will generally be laid in an open cut trench (i.e., excavating down to required depth, installing the duct, and then backfilling), except where there are geographical or environmental constraints that would prohibit open cut trenching. At these locations, it is intended to use trenchless techniques. To support with developing scheme feasibility, as part of Pre-Front End Engineering Design (Pre-FEED) works, FLOTATION ENERGY LTD ('FEL') have appointed Stockton Drilling Ltd ('SDL') to complete a Feasibility Assessment of the onshore cable route(s) including the trenchless crossings.

## 1.3 DOCUMENT INTRODUCTION

Stockton Drilling Ltd. are asked on a regular basis about the constructability of landfalls and outfalls due to our track record and experience of delivering these project scopes. This document provides the reader with a high-level description of the methods, techniques, and constraints required to successfully deliver the cable route installation.

## 1.4 LIMITATIONS

This document is intended to contain high level only data and shall be regarded as indicative based on the information available to date to SDL. Liaison with local authorities, Governmental, Non-Governmental Organisations and environmental organisations was not carried out as part of this response.
This report was written in April 2023 and should be considered in the light of any changes in legislation, statutory requirement or industry practices that have occurred subsequent to this date.

## 1.5 DEFINITIONS AND ABBREVIATIONS

| Abbreviation | Description |
|---|---|
| ACOP | Approved Code of Practice |
| AOD | Above Ordnance Datum |
| BTS | British Tunnelling Society |
| DCA | Drilling Contractors Association |
| FEL | Flotation Energy Ltd |
| HDD | Horizontal Directional Drilling |
| JCOP | Joint Code of Practice |
| SDL | Stockton Drilling Ltd |
| -ve / +ve | Negative & Positive – Refers to direction of construction |

## 1.6 INDUSTRY GUIDANCE

| Key Sources of Information (legislation, Approved Codes of Practice, Guidance Notes, etc) |
|---|
| Health & Safety at Work etc. Act 1974 |
| Management of Health & Safety at Work Regulations 1999 |
| Workplace (Health, Safety and Welfare) Regulations 1992 |
| Construction (Design and Management) Regulations 2015 |
| Control of Noise at Work Regulations 2005 |
| Control of Substances Hazardous to Health Regulations 2002 |
| Electrical Equipment (Safety) Regulations 2016 |
| Health & Safety (Consultation with Employees) Regulations 1996 |
| Health & Safety (First-Aid) Regulations 1981 |
| Health & Safety (Safety Signs and Signals) Regulations 1996 |
| Lifting Operations and Lifting Equipment Regulation 1998 (LOLER) |
| Manual Handling Regulations 1992 |
| Personal Protective Equipment at Work Regulations 1992 |
| Provision and Use of Work Equipment Regulations 1998 (PUWER) |
| Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) |
| DCA HDD Technical Guidelines |

## 1.7 DOCUMENT SCOPE

The scope and objectives of this construction execution plan are to:

- Develop/Describe preliminary cable route within the existing red line boundary constraint
- Develop/Describe the working areas required for the onshore cable installation
- Identify hazards and constraints that may impact on the installation methodology
- Identify lengths that will require trenchless installation, and lengths which could be open cut
- Undertake a Preliminary Engineering Appraisal of potential trenchless techniques, including developing Concept Design Arrangements
- Undertake a Preliminary Engineering Appraisal of open cut lengths, with a specific focus on cut and fill volumes
- Summarise likely construction plant, personnel, accommodation, traffic and transport requirements
- Present Recommendations for further work including a gap analysis of investigations and surveys.

Notwithstanding the foregoing, the primary objective of this Pre-FEED study is to present feasibility stage layouts and arrangements such that these can be considered within environmental, landowner and planning approvals to be progressed by FEL. A full FEED study would thereafter be required to develop the proposals.

## 1.8 TECHNICAL DOCUMENTS AND GUIDELINES

The techniques, methodologies and sequencing follow the practices laid out in the following documents:

- BS 6164 ACOP Tunnelling
- BTS JCOP Risk Management of Tunnel Work
- DCA HDD Technical Guidelines

## 1.9 DOCUMENT PURPOSE

The Construction Execution Plan has been prepared to ensure compliance with the Project Environmental Management Plan, H&S, QA Plan and other associated procedures. As the project progresses, this plan will be reviewed and amended as necessary in light of any changing circumstances. Such circumstances may include: - unforeseen adverse weather conditions and or localised flooding, design changes, preferred construction methods, operational constraints and landowner issues which become apparent during construction. Such changes will be notified to all working on the project that may be affected. Mitigation measures will be designed by the relevant advisor in conjunction with the project engineer, installed by the relevant crew and approved by the construction manager.

The purpose of the Construction Execution Plan (CEP) is to identify and set out ways of managing risks associated with Design and Construction on the proposed cable installation. It is based on a risk assessment approach and draws on the experience and knowledge of the Project Engineers and Construction Managers.

# 2 PROJECT EXECUTION & MANAGEMENT

## 2.1 STAGE I (OUTLINE DESIGN)

At pre–FEED Design Stage, information on which to form the basis of this Execution Statement is relatively limited. This report is therefore prepared on a relatively general basis and is substantially appropriate to all the sub projects related to the overall Cable Project. Appropriate project specific details are however included in the text wherever relevant or available.

## 2.2 CONTRACT ADMINISTRATION & MANAGEMENT

The site establishment will be substantially self-contained such that it can carry out most normal Head Office functions including purchasing (of locally sourced material), hire of plant, transport and equipment, preparation of sub-contract enquiries, bid evaluation and award of sub-contracts etc.

Each function carried out on site also has the full support of the respective Head Office department as and when required. Accounts however are paid from Head Office, once authorised from site. The Project Manager is the formal point of contact with the client but normal day to day contact is carried out at all levels of the organisation with the client's appropriate staff. Development of effective communication is positively encouraged; SDL are particularly committed to the effective implementation of collaborative project management systems.

All operations in the field will be managed and co-ordinated by the appropriate Construction Manager supported by the various disciplines such as Engineering, Planning and Health &Safety etc. Construction meetings will be held prior to the start of each working day to co-ordinate the activities of each crew particularly where they interface and also to re-deploy plant where necessary to maximise utilisation. Notices of any changes to the Daily Work Programme will be advised at this time.

The Administration Manager is responsible for control of the works, all site purchasing and for arranging any field support required such as fuel, temporary materials, transport, fitters etc.

Personnel are recruited at the site by the project team either locally or by employing specialist tradesmen/operatives who are known to the team from previous major cables constructed by SDL.

## 2.3 DEVELOPMENT OF THE H&S PLAN

Health &Safety is of paramount importance to the project. It is an objective of the general safety management process to develop a positive safety culture through training, communication and ensuring a competence level equal to or beyond legislative requirements. All aspects of design and construction are subject to the Health &Safety at Work etc. Act 1974 and the Construction (Design and Management) Regulation 2015.

The Health &Safety Management Plan will be based on the requirements as set out in the Project Scope. It will be further developed and continuously maintained throughout the life of the Contract to cover or incorporate as appropriate the following:

- List regulatory authorities having jurisdiction over the project
- List the actual regulations which must be complied with
- List all permit and certificates required (assess and allow for the time required to process/obtain)

- Identify a focal point for H&S matters
- Project team/hierarchy and identifying roles and responsibilities within the project
- Prepare design philosophy, including Fire and Safety philosophy, identifying all potential risks and criteria of acceptability
- Specific safety studies shall be required to perform HAZID, HAZCON and HAZOP/R.A/Audit and identify the resources required to carry them out with adequate allowance of both time and budget funds
- Set down design codes, standards, practices and specifications
- Prepare variance procedure to control deviations from above codes etc.
- Prepare cause and effect chart
- Identify special safety concepts, special and unusual design criteria and conditions; ensure all are examined for compliance with regulations, codes and design philosophy
- Set up formal procedure for review and approval of documentation
- Establish a procedure to control changes after first approval
- Specify safety studies required ensuring that resources, time and budget provision is made to carry out both the studies and any recommendation arising
- Project specific inductions and tool box talks will be developed in line with Project requirements.

### 2.4 DEVELOPMENT OF THE PROJECT QUALITY MANAGEMENT PLAN (PQMP)

The Project Quality Management Plan (PQMP) sets out the specific quality practices, resources and sequence of activities relevant to the project. The Quality objectives and management strategy of the project will at all times be established to achieve:

- Client quality requirements are recognised and integrated with those of SDL to form combined and compatible project quality requirements in line with International Standards ISO 9001:2015 Quality Management Systems and aligned with ISO 10005:2018 Guidelines for Quality Plans
- Project quality requirements are highlighted in a consistent form
- Project Quality requirements are implemented and controlled by working in a systematic manner to formal procedures and work instructions
- All products and services whether supplied by SDL or its subcontractors or suppliers conform to contractual and Regulatory Requirements
- The facilities are designed, constructed, installed and commissioned in such a way that they are safe, reliable, operable and maintainable, in so far as the scopes of the Project and Regulatory requirements prescribe
- All deliverables are checked and verified before issue in accordance with a supporting Inspection Test Plan (ITP), so that any errors and deficiencies are detected at an early stage and timely remedial action taken.

## 2.5 DEVELOPMENT OF THE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

The Construction Environmental Management Plan (CEMP) will be further developed and refined during the Construction phase by SDL and considered a "live document" for on-going adaptation throughout the Construction Phase of the Project, in line with client requirements.

The plan will establish individual responsibilities along with reporting and communication lines. Particular attention will be given to communication to ensure that, for example, appropriate reviews of Operational Procedures are carried out during their preparation to ensure that environmental issues are adequately addressed. Similarly, the significance of appropriate liaison with Client and Stockton Drilling Ltd/Flotation Energy Ltd (SDL/FEL) construction management team will be established to ensure the proper assessment of environmental issues. Key elements in the plan will include:

- Controls for impacts identified in procedure "Environmental Aspects and Impacts" as modified to incorporate further project specific requirements
- Consents identified as a requirement
- Requirements in the Environmental Statement, e.g.: ecological, archaeological surveys and any other relevant report or document
- Identify and establish the timing of all necessary environmental audits, inspections and checks
- All other environmental requirements of the Contract.

## 2.6 ENVIRONMENTAL IMPACT ASSESSMENT

The Preliminary Design work scope has generated a number of desk-based studies (including geology, archaeology and ecology) which in addition to field survey work, will go to in the preparation of the Project ES and be supplemented by SDL.

The work embraces the following key elements:

- The preparation of technical data in support of a comprehensive ES submission
- in compliance with statutory requirements for the Scheme.
- Enviro-geotechnical and photo-geomorphologic surveys and associated reporting
- Archaeological investigation and monitoring
- Groundwater monitoring, analysis and reporting
- Construction Traffic modelling and Assessment
- Stakeholder Analysis including Socio Economic assessment

# 3 PROJECT EXECUTION & MANAGEMENT

## 3.1 DESIGN STRATEGY / PHILOSOPHY

The Design Strategy will be developed to achieve design completion on, or ahead of, the required date.

In order to achieve this, a deliverables schedule and Design Programme will be prepared, to identify objectives for completion and to clearly identify the design deliverables within the projected milestones of the design period.

It is SDLs objective to continually challenge the developing design in a proactive manner to ensure that a cost effective and practical design is achieved. This should meet or exceed the expectation of the client without compromise to SHE, the Client's specified requirements or the interests of any of the stake holders.

## 3.2 DESIGN IMPLEMENTATION

Some elements of the design may be carried out on a subcontract basis by an approved Engineering Design subcontractor, under the direct control of SDL personnel as set out in the project organograms. In general, the principal will be that, so far as is practical, route finalization, engineering and design with regard to the cables including the crossings, will substantially be carried out by SDL directly employed engineers.

As already set out the overall management and co-ordination of all aspects of the design will remain with SDL.

It is SDL's belief that this arrangement is particularly beneficial in providing effective overall control, whilst ensuring that legislative measures, stake holder interests and client requirements are met.

Furthermore, SDL believe that this approach to design management offers the Client the maximum potential to achieve value engineering savings in the development of, what we consider to be, practical and highly effective solutions to complex engineering challenges.

This working arrangement has been developed over a number of years on numerous projects. Our interface management is now well established and proven to be successful in achieving safe, practical and cost-effective designs.

## 3.3 DESIGN PHASE - STAGE I (OUTLINE)

### 3.3.1 Outline Design – Cable route

A preliminary design will be developed for the project by Flotation Energy. It will establish functionality and responsibilities for all design team members and also, established key dates for the achievement of all the design activities. Reference to control documentation, design parameters and project design requirements are set out in the Outline Design deliverables Schedule. These include, but are not limited to:

**Outline Design (Cable) – for EIA / Planning / Tender**

- Route Selection via Vantage Point Survey
- Route Selection via Field walk
- Constraints Analysis (Desktop)
- Constraints Analysis (Following Field Walk)
- Geology Analysis – Geotechnical Profile from public records
- Mining Risk Analysis – Mining report and mitigation risks report
- Preliminary Borehole Location analysis and design
- Topographical Survey – LIDAR and Observed Data
- 3rd Party Services data collection and liaison
- Statutory Body liaison - Scottish Environmental protection agency / Natural Scotland etc (SEPA/NS)
- Cable format/size/OD confirmation
- Cable Operating Range analysis
- Cable Ramp up / Start-up and operational control philosophy
- Preliminary Crossing Design methodology
- Preliminary Route maps (1:10k)
- Preliminary Stripmaps (1:2500)
- Preliminary Route Corridor dwgs (1:2500)
- Construction Methodology definition
- Logistics Plan
- Construction Environmental Plan
- Water Management Plan
- Standard Operating Procedures for construction methods
- Plant and Equipment Noise Data assessments
- Document Control Drawing Register

### 3.4 DETAILED DESIGN - CABLE

So far as is practically possible, continuity will be maintained from the Preliminary Design into the Detail Design Stage. The following key activities will be included:

- Review Preliminary route design
- Develop detailed construction designs and drawings
- Interface in preparation of operational procedures, risk assessment
- Review Preliminary Design Report, cable and installations
- Correlation of all topographical survey data
- Correlation and re-assess of Stakeholder constraints
- Cable and crossing designs and calculations (Inc; Independent design check and approval of crossing drawings)
- Drainage Design
- Detailed design HAZID HAZOP
- Preparation and finalisation of Construction drawings and MTO's
- Preparation of all Temporary works designs/calculations/registers etc
- Preparation of As Built drawings
- Interface with and output for Data Books and HSE file preparation
- Interface with Client, HSE, operations and liaison personnel

# 4 SITE INVESTIGATION

## 4.1 SOIL INVESTIGATION (WINDOW SAMPLES)

Soil investigation will be carried out along the proposed route during the Preliminary Design Phase.
This would normally consist of small trial holes excavated every 100-500m to examine the topsoil and subsoil, with deeper investigation (to approx.5m) completed by the use of excavator. This is to prove ground conditions in each section and to ensure that the trenching methods and programming envisaged is appropriate.

## 4.2 BOREHOLES

An initial desk study was undertaken, supported by a line walk survey to determine the extent of a detailed geotechnical site investigation for preliminary design. This exercise determined type, location and depth of required boreholes and Trial holes. This preliminary Geotechnical investigation when complete, will be utilised to determine the proposed methods of construction for the cable installation and associated structures. Should subsequent borehole and trial hole investigation be required (as appropriate to proposed construction techniques throughout the route), it will form the basis for determining areas of further investigation. Boreholes will be sited at appropriate locations throughout the route and particularly at major crossing points. They may be performed using a bipod light cable percussive boring rig. Further and deeper survey involving rotary rigs may also be necessary to investigate some areas of the route, particularly where deeper trenchless crossings are being considered.

## 4.3 TRIAL HOLES – SERVICES

Trial holes will also be excavated, by hand (or using a small tracked excavator), during the Detailed Design Phase to prove the location, depth, size, material and condition of existing services and plant, both in-field and at roadsides. This will ensure that the crossing methods envisaged are appropriate. A Trial Hole (Service) Report will be produced by SDL which records the location, depth, size, material and condition of existing services and plant.

## 4.4 TRIAL HOLES – GEOLOGY (SUBSEQUENT TO MAIN SI)

Trial holes will be excavated every 100-500m during the preparation of the right of way to prove ground conditions in each section to ensure that the trenching and crossing methods envisaged are appropriate.
A Trial Hole (Geology) Report will be produced by SDL which records the location, depth, size, strata, water ingress, and stability.

## 4.5 REPORTING

A comprehensive record of all information gathered from the Soil Investigation campaign which will be collated, comprising as a minimum:

- Logs produced from field observation of Bore Hole campaigns
- Will include visual field interpretation of material encountered, location details, water table level details (first encounter and standing level), and full details of any on site testing (SPT's etc)
- Detailed laboratory reporting and analysis
- Any interpretative observations and report.

# 5 LIAISON WITH THIRD PARTIES

## 5.1 PRE-ENTRY VISITS

Prior to any entry on the right of way for construction, the CLIENT, along with SDL will visit the owners, occupiers or tenants of all land through which the cable passes, to ascertain their requirements.

Reports on the condition of the land and pre-construction drainage details will be prepared by the CLIENTS Lands Liaison Officer in conjunction with an SDL Representative.

Existing land drainage data gathered will be used to inform the Pre-construction and Post-construction drainage design.

Requirements for water troughs, temporary fence types, access arrangements and reinstatement will be noted on the pre-entry form and any factors which may affect construction identified from the land user's local knowledge.

SDL will issue a copy of the pre-entry form to the CLIENT and the relevant landowner and then transfer the information onto two sets of strip maps, one of which will be issued to the right of way foreman, together with a copy of the pre-entry form.

The Lands Liaison Officer will communicate regularly with all landowners to ensure compliance with all agreements.

## 5.2 LIAISON WITH LOCAL AUTHORITIES AND UTILITY OWNERS

Meetings with all Local Authorities, Police, owners of utilities and services will be arranged to introduce the personnel involved and to establish contacts and work procedures.

Discussions during these meetings will cover the aspects of construction of interest to the particular bodies and their requirements, restraints and restrictions in relation to work in their areas will be ascertained.

When Construction commences, close liaison will continue and a Programme for carrying out trial holes to establish the location and characteristics of services will be agreed.

Depth of services and mechanical excavation restrictions in their proximity will be confirmed. All authorities will be notified in advance of works that may concern them and they will be given access to inspect these works at any time.

## 6 CONSTRUCTION SEQUENCING (OVERVIEW)

In order to provide a context for the following Construction Execution Plan (CEP), SDL have worked with the project team to model a potential route within the current project red line boundary. This route is provided to give guidance as to access routes, construction compound locations, crossing points, crossing methodology, working area requirements, topographical challenges, and construction philosophy. Environmental constraint data has been considered and reviewed by the project team when analysing this potential route. Where known services (Water/Gas/Oil/Electric etc) are known to exist, they have been considered for routing purposes. The route modelled is conceptual only, and should not be taken as project approved. For illustrative purposes, typical working widths @ approx. 50m width have been modelled to the route between Sec 0 & Sec 20. A twin cable duct will require a working width between 40-50m wide, with 10m x 30m extra box outs at crossings, or where topography dictates. The route New Deer Substation (South of NG SS) to Landfall (Transition Joint Bay) = 34km currently shows:

Road crossings = 20
River Crossings = 4
Ditch Crossings = 44
Track crossings = 22
Treeline Crossing = 2
Service Crossing = 6 (Major Cables & Pipelines)
Lockout/Cul-de-sac working = 3/4

Underground services (Cables/Pipelines/Sewers etc) have not been included in the appraisal at this stage, unless data was available in the public domain. This will result in extra crossings, with extra working area, and likely require rerouting of the centreline of the proposed route.

Detailed geological data is not yet available, and has not been considered as part of this appraisal at this stage. However, open-source data has identified that:

- RDX1 through to RDX3, shallow rock may be encountered for approx 40-50% of the route.
- RDX3 through to RDX6/7, shallow rock may be encountered for approx 5% of the route.
- RDX6/7 through to DRLX7/1, shallow rock may be encountered for approx 40-50% of the route.
- DRLX7/1 through to RDX8, shallow rock may be encountered for approx 10% of the route.
- RDX8 through to RDX11, shallow rock may be encountered for approx 70% of the route.
- RDX11 through to RDX16, shallow rock may be encountered for approx 5% of the route.
- RDX16 through to End Line (SEC20), shallow rock may be encountered for approx 2% of the route.

Whilst modelling the proposed route, it became clear that the most efficient way to approach construction activities for the cable, would be to install along a preprepared working width (Spread). This is due to various factors, including existing road network access, location of major crossings, reduction of traffic to public roads in what is a rural farming area, and materials logistics. Work would commence at Sec 0 with installation of a main construction compound, working width, and Landfall HDD Compound. Once complete, the working width would be fenced out from RDX1 to RDX 20, with subsequent activities (Topsoil strip, Crossings, Trench excavation, Cable installation etc) to follow in succession.

## 6.1 CONSTRUCTION SEQUENCING

The sequencing of construction activities for the Green Volt electrical system (GVEC) will be driven by a combination of the construction periods necessary for the different element that comprise the electrical system and how these relate to the offshore and enabling construction programme at the new deer substation.

The electrical system elements with the longest maximum construction period within the GVEC is the construction of the onshore substation as it has the most complex construction activities. This project element is also progressed within a discrete construction site rather than being a linear project, which drives a sequential order of key construction phases on these two sites.

Linear project elements such as the onshore cable route, provide scope for multiple cable sections to be in construction at any one time, resulting in a shorter overall construction period. It is for this reason that the onshore substation is likely to be the first construction site that will be established.

## 6.2 SUBSTATION / GVEC CONSTRUCTION SEQUENCE

Site Establishment - The first stage of construction at both the onshore substation and GVEC will be to establish the construction access and associated temporary construction compounds (TCC) to allow the mobilisation of the main construction site.

Enabling Works and Planting - The main enabling works establishes the substation/GVEC footprint and basic infrastructure, such as drainage and internal access roads. Once the enabling works have been completed, consideration will be given to commencing strategic planting around the perimeter of the site, where this is practicable, to ensure any screening has maximum growing time prior to completion of construction.

Consideration will also be given to incorporating Sustainable drainage system (SUDS) ponds within the Substation boundary.

Civil engineering works - Establishes all equipment foundations and construction of buildings within the substation/GVEC site. For the onshore substation, the civil works phase of construction is anticipated to be longer than for the GVEC due to the respective sizes of the two sites and the amount and nature of equipment that will be located within the substation.

Mechanical and Electrical (M&E) build - The M&E phase comprises the delivery and installation of all electrical equipment, including any Abnormal Indivisible Load (AIL) and deliveries such as transformers.

This phase includes testing and proving all of the equipment and systems to ensure that they are ready for energisation. Again, due to the complexity of the equipment and systems installed, the commissioning phase for the onshore substation is likely to be longer than for the GVEC.

Energising - The substation will be energised and a set of post-energisation tests carried out to establish that the substation is working as expected.

### 6.3 CABLE CONSTRUCTION SEQUENCE

Following the start of construction at the substation and GVEC sites, cable installation will commence. The cable corridor has been split into sections, (defined between road crossings). As the cable route construction works are linear in nature, construction can be undertaken on several sections along the route, which may be more productive than having a single work location that advances along the cable route in a linear fashion.

For each route section, initial mobilisation will involve the installation of temporary fencing through the section and establishment of the bell mouth adjacent to the public road and temporary construction compound at the mobilisation locations. Once complete, the construction corridor within the section will have the topsoil strip carried out in order to establish the haul road through the section. At this point any temporary agricultural land drainage measures, including installation of temporary header drains, will be installed for each route section prior to the commencement of any trench excavation works, where necessary.

Undertaking construction activities on multiple work locations along the cable route during the construction phase also allows the optimum sequencing of trenchless and open cut installation techniques, thereby achieving a shorter overall construction schedule. For example, a trenchless installation team can access a cable section to undertake the trenchless crossing and the installation of the cable ducts at the cable crossings in advance of the open cut installation team mobilising to that section. This ensures that, when the open cut team mobilises to this route section, they can carry out their installation works at a faster rate as they are not limited by waiting on the completion of trenchless crossings in that section.

For open cut trenching, excavation and duct installation rate is in the region of 100m-200m/day per circuit, which would comprise installation of cable ducts, cement bound sand and warning boards, as well as subsoil reinstatement. Final drainage reinstatement within the subsoil would follow after the trenching and duct installation team have completed their works. Trenching work will be focused on completion of 500 m-1000 m sections between joint pit locations, rather than completing a long section of a single trench and returning back to the start to commence the next. Total installation time, including drainage reinstatement for a section between joint pits would be in the region of 6 weeks for 600m cable sections (or 10 weeks for 1000 m cable sections), assuming two excavator teams working in parallel along the route section. Where complex ground conditions are encountered or greater burial depth/complex drainage reinstatement in required, the installation rate would be slower.
Completion of the duct installation works allows cable pulling and jointing activities to take place. Cable pulling typically requires a large cable drum to be delivered by HGV, with cables being pulled through the pre-installed cable ducts with a cable winch and pulling engine. When more than one cable section has been pulled into the ducts, the jointing of the cables can commence. This process is repeated along the entire cable route to create a complete cable system. Cable jointing requires the establishment of a temporary jointing area to ensure jointing works are carried out in “clean room” conditions. Typically, cable pulling and jointing works will take in the region of 1-2 weeks at each set of joint pit locations along the route.

Topsoil strip across the working width of the construction corridor and haul road in any cable route section will remain in situ until completion of construction and testing for that entire portion of the cable route (for example, from Onshore Substation to GVEC). The retention of the haul road for this period is necessary to retain access along the route to prepare the cable for test, install any monitoring equipment that may be required and carry out any remedial works identified during the testing process. Once the end-to-end test of that particular route section has been completed, any remedial works carried out and the cable system proven, the TCCs, haul road and topsoil reinstatement can be reinstated for that section.

### 6.4 SYSTEM ENERGISATION SEQUENCE

The energisation sequence of GVEC necessarily follows a sequence driven by proximity to the National Grid transmission system. The onshore substation will be energised first, following completion of the works at Yelland Substation and the connection between the two, with the cable route section between the onshore substation and GVEC being energised next. Once this is complete, the GVEC can then be energised. The energisation of the final section of onshore cable between the GVEC and landfall can only be energised once the marine cable has been installed and terminated at both ends.

### 6.5 REQUIREMENT FOR CABLE TESTING

Site acceptance testing of the cable demonstrates the integrity of the cable system prior to connection and final energisation from the network. The testing is primarily aimed at demonstrating the integrity of the joints along the cable route, but also ensures the cable has not suffered any damage during transport and installation activities.

The main test to be carried out on the system is a High Voltage (HV) or “pressure” test on the individual cable cores. This test typically involves subjecting the individual cables to a voltage at or slightly above the anticipated operating voltage to demonstrate system integrity prior to connection to the transmission system.

In addition to this main test, ancillary tests will also be carried out on the cable sheath and fibre optic cable system to check the integrity of these parts of the installation.

During the testing process, access will be required along the cable route section being tested to monitor individual joint locations and also access the link boxes to prepare the cable for testing. It is for this reason that the construction haul road will need to be retained until testing of that cable section is completed and any remedial works identified as necessary during the test have been carried out. Once a test between nodes has been completed and all circuits between nodes proven, the haul road for this section can be removed and the route section fully reinstated including topsoil reinstatement and removal of fencing.

The only point on the cable where access will be required for the marine cable pull-in, termination and testing operations would be at the Transition Joint Bay location. As no joint pits or link boxes are present along the marine cable, all installation and reinstatement on the beach area will be completed following completion of cable pull in and prior to the commencement of any testing of the marine cable system. The fencing-off of works on the beach is limited to short and discrete periods of time for trenchless exit pits and cable duct installation, duct stitching and cable pulling.

### 6.6 SELECTION OF JOINT PITS AND LINK BOX LOCATIONS

Cable joint pits, approximately 10 m by 2 m, will be required to house the joints between individual lengths of cable, with one jointing pit required per circuit. These are likely to be required every 600 to 1000 m for each circuit. The joint pits will consist of a concrete plinth and may include concrete walls. Each jointing pit associated with a single circuit will each require a separate smaller concrete enclosure known as a link box, to provide connections between cable sheaths essential for the efficient operation of the cable and for fault testing. The link boxes house the cross bonded cable sheath connections between cable cores, which produce the reduction in circulating currents in the cable sheaths and thus reduce running temperatures in the cables.

Each link box associated with a joint bay of each cable circuit will consist of a manhole set in a concrete plinth at ground level. The manhole covers will either be heavy duty to provide agricultural vehicle load-bearing capabilities or lightweight construction allowing access to personnel without need for additional lifting machinery. Each link box covers will be 1200 x 900 mm. Depending on final design, the link boxes may be demarked using fencing, marker posts or a ground beam or installed without demarcation, subject to discussions with the landowner. Their locations will be recorded by GPS and details given to landowners for their personal records. The link boxes will be connected to the jointing pits via an underground testing cable which will be buried based on the same principles as for the export cables. One link box will be required for each circuit every c.600 to 1000 m and will be located within the 60 m cable corridor, but no more than 15 m from its corresponding jointing pit.

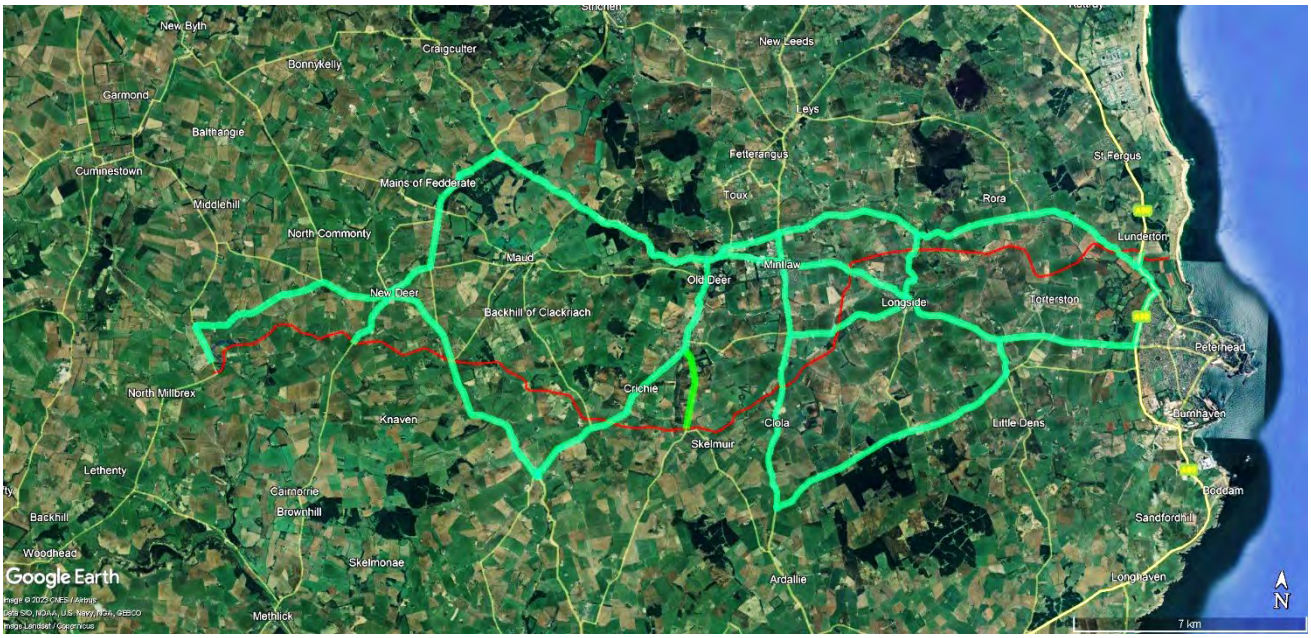
The location of each joint bay within the cable circuit will be very constrained and is key to the operation of the electrical system. The distance between joints is required to be equally spaced (so each section of cable is the same length) in order to minimise in circulating currents in the cable sheath and therefore reduce running temperatures in the cable. Given that all lengths of cable within each circuit need to be of the same length, the determination of that length, and therefore exactly where the jointing bays will ultimately be located, is a complex task that requires a significant amount of information. The siting of jointing bays can only be determined once the detailed design of other parts of the electrical system have been completed. This includes finalisation of the exact route within the construction corridor for each circuit, the determination of the location and profile of all trenchless crossings and the final onshore cable design, to be determined with the appointed onshore cable manufacturer.

Factors that will influence the determination of cable section lengths and therefore determines the jointing bay locations along the cable route are listed below. Note, this list is not hierarchical and all factors will be given consideration in the design phase:

- A limit on the length of individual cable lengths (c.1000 m) due to limits on transportability and friction induced cable stress during cable pulling. There is a preference, within that limit, to have as long cable sections as possible, to limit the number of jointing bays and therefore reduce construction time and complexity.
- Ensuring cable joints aren't located at inaccessible locations such as below railways, roads, or drains, where cable jointing pits could not be constructed.
- Ground condition information taken from pre-construction surveys and input from landowners via the project's Agricultural Liaison Officer (ALO).
- A preference, where possible, to locate jointing bays at field boundaries.
- Once joint bay locations have been determined, the location of the link box associated with each joint can be determined. Each link box must be within 15 m of the joint as the link between cable phases provided by the link box loses its effectiveness beyond that distance.
- The link boxes will be located within the construction corridor, but the link boxes associated with each circuit may be grouped and orientated in a number of different arrangements. Discussions will be held between relevant landowners and the ALO regarding the arrangement, such as the preference for the orientation of a number of adjacent link boxes to be in-line with field ploughing direction.

# 7 MAIN CONSTRUCTION ACTIVITIES – PHASE II / CONSTRUCTION

## 7.1 ACCESS – REGIONAL/LOCAL




The Green Volt proposed Landfall and onshore cable route is located approx. 1.25km North of Peterhead, North east Scotland. The Onshore cable starts at New Deer Substation and runs west to east generally, before terminating at the Landfall compound/End line to the west of Craigewan links golf course.

With the main construction compound located close to the New Deer substation, with construction direction west to east, the main access approach from the south will be the A90 to Aberdeen, A947 (Old Meldrum Road), B9170, through Methlick on the B9005/B9170, then B9005 to C Class Road for Burnend of Gight/Maryhill.

With the main construction compound located close to the Landfall compound/End line to the west of Craigewan links golf course, Peterhead, with construction direction east to west, the main access approach from the south will be the A90 to Aberdeen, as RDX20 is the A90 road crossing. Located at RDX 20 (Road crossing # 1) south of Lauderton village. The rational for locating the construction compound at RDX 20 is in order to reduce HGV movements in the more rural areas along the route. Immediate access from the A90 is also a major benefit. It may be necessary to consider traffic management measures at the construction compound access, in order to mitigate HGV movement impacts on the local infrastructure.

West/East or East/West Access dependant upon construction direction and main compound location, will utilise the following routes:

The A950/A981/B9170 run through the villages of Longside, Mintlaw, & New Deer and will be the main access spine for access to the cable route working areas. It is recommended that access through these villages is assessed by direct observation (site visit).
The A948 & B9030 (New Deer/Auchnagatt/Stuartfield/Old Deer) provides access to the southern and central area of the cable route.
The A952 & several C Class roads (Suitable for Farm equipment/HGV) provides access to the central and eastern end of the cable route.
South - A90 to Aberdeen, A947 (Old Meldrum Road), B9170, through Methlick on the B9005/B9170, then B9005 to C Class Road for Burnend of Gight/Maryhill.

It should be noted that the rural road network in the area serves the local farming community, which provides suitable access routes to the cable route. However, it should be noted that some of the smaller villages have challenging road layouts, making HGV access difficult. Further investigation for access is recommended.

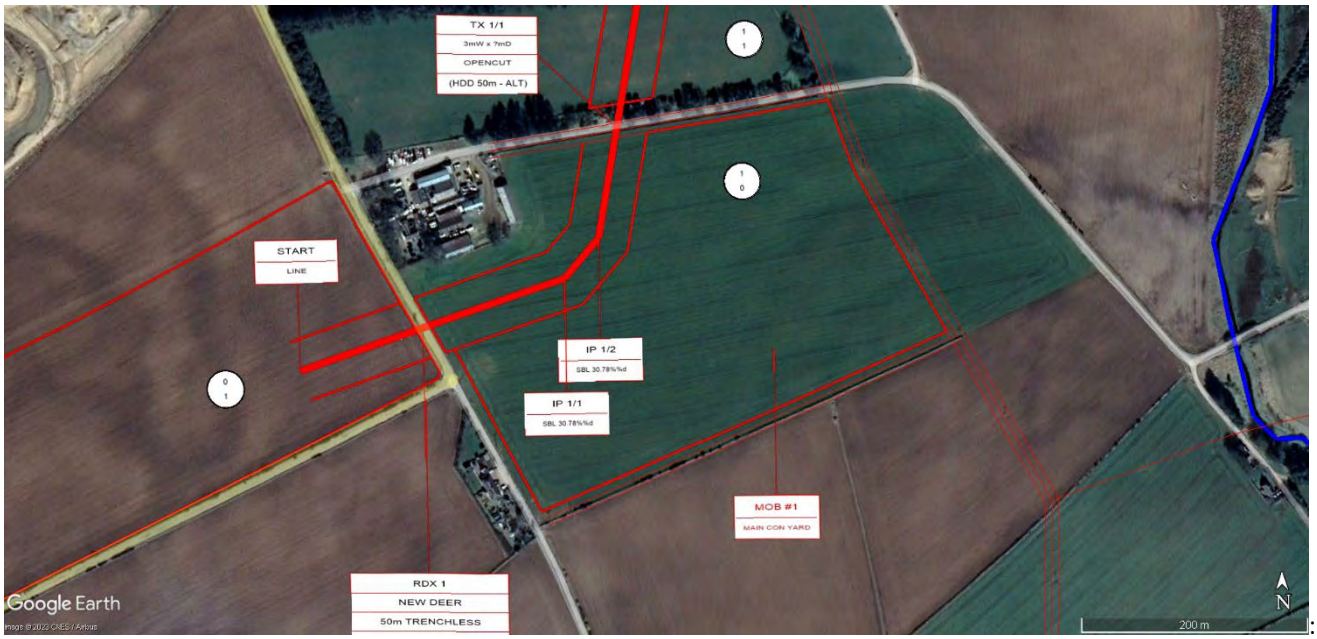
### 7.1.1 Access – Sectional (inc: No access, cul-de-sacs, bridges, etc)

| ACCESS POINT | ROAD CLASS | ACCESS POINT | ROAD CLASS | ACCESS POINT | ROAD CLASS | ACCESS POINT | ROAD CLASS |
|---|---|---|---|---|---|---|---|
| **RDX1** | A948/C Class | **RDX6/7**[a] | A948/B9106 | **RDX12** | C Class/A952 | **RDX17**[fghl] | C Class |
| **RDX2** | C Class | **RDX8**[b] | C Class/B9030 | **RDX13**[d] | A952 | **RDX18**[j] | C Class |
| **RDX3** | B9170 | **RDX9** | C Class/B9030 | **RDX14**[e] | C Class | **RDX19**[j] | C Class |
| **RDX4** | C Class | **RDX10**[c] | B9030 | **RDX15**[ef] | C Class | **RDX20**[k] | A90 |
| **RDX5** | C Class | **RDX11** | C Class/B9030 | **RDX16**[fghl] | C Class | **SEC20**[l] | A90 |

a. Requires off easement access / transport on low loader / both sides of road
b. DRLX 7/1 = No through access – requires move around / cul-de-sac working / transport on low loader
c. Mobilisation area at RDX10-ve.
d. Mobilisation area at RDX13+ve.
e. RVX 14/1 = No through access – requires move around / cul-de-sac working / transport on low loader
f. DRLX 15/1 = No through access – requires move around / cul-de-sac working / transport on low loader
g. RVX16/1 = Possible no through access - requires move around / cul-de-sac working / transport on low loader
h. RVX16/2 = Possible no through access - requires move around / cul-de-sac working / transport on low loader
i. *Section 16 includes 2 # river crossings which will require at least one having a bridge/flume crossing, in order to maintain access. Alternative off easement accesses have not been investigated at the time of writing this document.*
j. RVX18/1 = Possible no through access - requires move around / cul-de-sac working / transport on low loader
k. RDX20-ve Access to A90 to be formed north of route crossing point.
l. RDX20+ve Access to be formed at ROW / Road intersect.

### 7.2 MAIN SITE YARD AND OFFICE COMPLEX (MOB # 1)

The project has identified an area approximately 450m to the south east of the existing National Grid Substation (New Deer) approximately 5.5km west of the village of New Deer, which would be utilised as a main site compound and office complex. MOB#1 is a relatively level singular field, utilised for arable cultivation. It has a dwelling to the north east corner, and has overhead (OH) electric cables to the North, East, and South boundaries. The area of the proposed compound is approximately 260m x 350m (80,000m²/8ha) MOB#4 = 250m x 220m (55,000m²/5.5ha). Access will be formed in the field boundary adjacent to the east side of the road, by removing approx 15m-20m of existing fencing/walling. The main site yard and office complex will be sited on a green field site. Due to the location of the access in close proximity to a T junction, it may be prudent to develop the existing gated field access, in order to provide adequate visibility splays. Traffic movement restrictions may be imposed for HGV or abnormal roads, as the road network in the New Deer area consists of a predominantly rural road network, with mainly B and C class roads. A detailed assessment of access routes is outside the current scope of this document. As the recent construction works at the National Grid Substation at New Deer would have required suitable access routes, it is safe to conclude that suitable access to the site is available.




Closest postcode to Access to Main construction yard and compound – AB53 6XU.

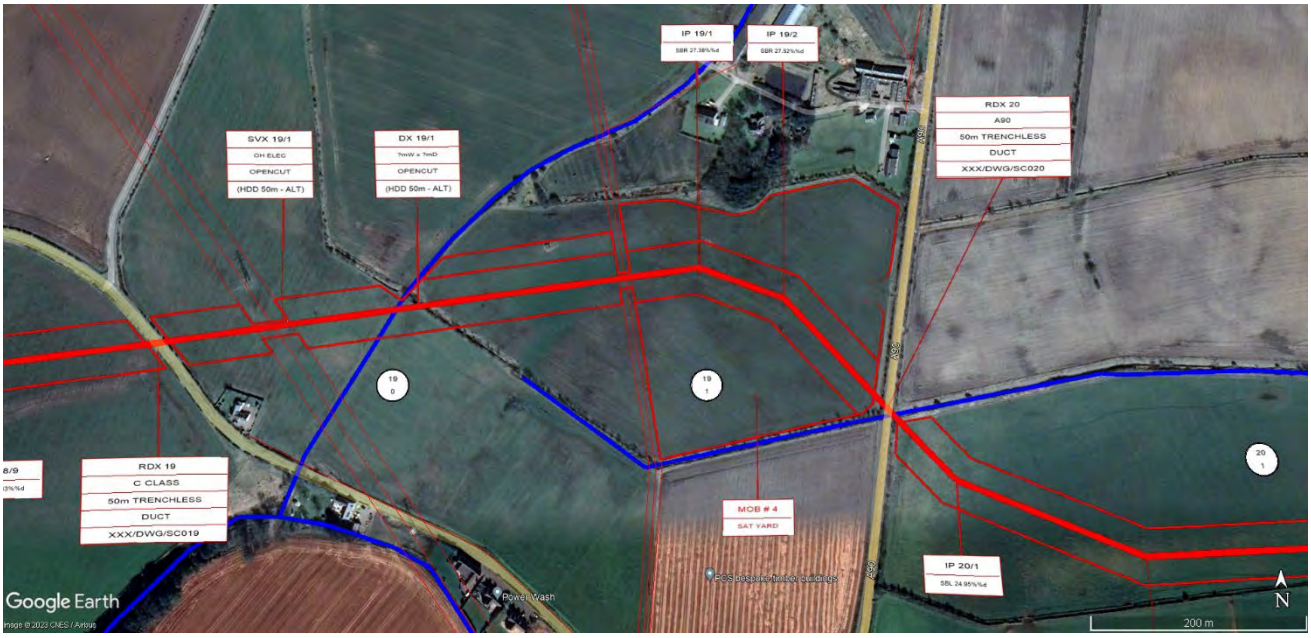
The Site yard has been identified as one of two areas most suitable area to house the required material, plant and equipment storage. If required, this site could accommodate approx. 100% of the entire cable project storage and mobilisation requirements. Other mobilisation and storage areas along the route will be utilised at the time of construction. The site yard will be the focal point of the construction phase of the cable project, with all staff mobilising to the Site yards on workdays, where they will park their personal transport (Cars/Bikes etc) before being transported to the work site in Works vehicles, such as Transit vans, 4x4 or minibuses. This prevents the areas around the work site in urban and rural areas suffering congestion and minimises parking problems both on and adjacent to the working site.

It is not known at the time of writing this report whether utilities for Power, Telecoms, and drainage are within proximity of the Main site yard and office compound.

It may be prudent to further investigate the availability of Brown Field/Industrial sites within the vicinity. These locations are preferred for main site yards as they often have existing services which can be connected quickly, as well as being located in medium to heavy industrial usage areas, which leads to minimal disruption to neighbours from Project operations. Security is also often easier to manage in Brown field sites due to existing fencing installation. Site Yard preparation generally involves a crew civilizing the site and removing existing debris / and topsoil etc using excavators or dozers. If required, concrete slabs may be installed to act as raft foundations for temporary sheds, which are erected using Mobile cranes.

### 7.3 MAIN SITE YARD AND OFFICE COMPLEX (MOB # 2)

The project has identified an area approximately 1500m to the north west of Peterhead, approximately 400m south of the village of Lunderton, which may be utilised as a main site compound and office complex. MOB#2 is a relatively level singular field, utilised for arable cultivation. It has a dwelling to the northeast corner, and has overhead (OH) electric cables to the west boundary, and an existing field drain/ditch to the south & east boundaries. The area of the proposed compound is approximately 250m x 220m (55,000m²/5.5ha). Access will be formed in the field boundary adjacent to the west side of the road (RDX20 - A90), by removing approx 15m-20m of existing fencing/hedging. The main site yard and office complex will be sited on a green field site. Due to the location of the access, it may be prudent to develop the existing gated field access, in order to provide adequate visibility splays. Traffic movement restrictions may be imposed for HGV or abnormal roads, as the road network in the Peterhead area may carry increased traffic loads at peak travel times. A detailed assessment of access routes is outside the current scope of this document. As the A90 is the main trunk route in the area, it is safe to conclude that suitable access to the site is available.




Closest postcode to Access to Main construction yard and compound – AB53 6XU.

The Site yard has been identified as one of two areas most suitable area to house the required material, plant and equipment storage. If required, this site could accommodate approx. 100% of the entire cable project storage and mobilisation requirements. Other mobilisation and storage areas along the route will be utilised at the time of construction.

The site yard will be the focal point of the construction phase of the cable project, with all staff mobilising to the Site yards on workdays, where they will park their personal transport (Cars/Bikes etc) before being transported to the work site in Works vehicles, such as Transit vans, 4x4 or minibuses. This prevents the areas around the work site in urban and rural areas suffering congestion and minimises parking problems both on and adjacent to the working site.

It is not known at the time of writing this report whether utilities for Power, Telecoms, and drainage are within proximity of the Main site yard and office compound.

It may be prudent to further investigate the availability of Brown Field/Industrial sites within the vicinity. These locations are preferred for main site yards as they often have existing services which can be connected quickly, as well as being located in medium to heavy industrial usage areas, which leads to minimal disruption to neighbours from Project operations. Security is also often easier to manage in Brown field sites due to existing fencing installation. Site Yard preparation generally involves a crew civilizing the site and removing existing debris / and topsoil etc using excavators or dozers. If required, concrete slabs may be installed to act as raft foundations for temporary sheds, which are erected using Mobile cranes.

### 7.4 MOBILISATION / DEMOBILISATION AREAS, AND OFF EASEMENT ACCESS

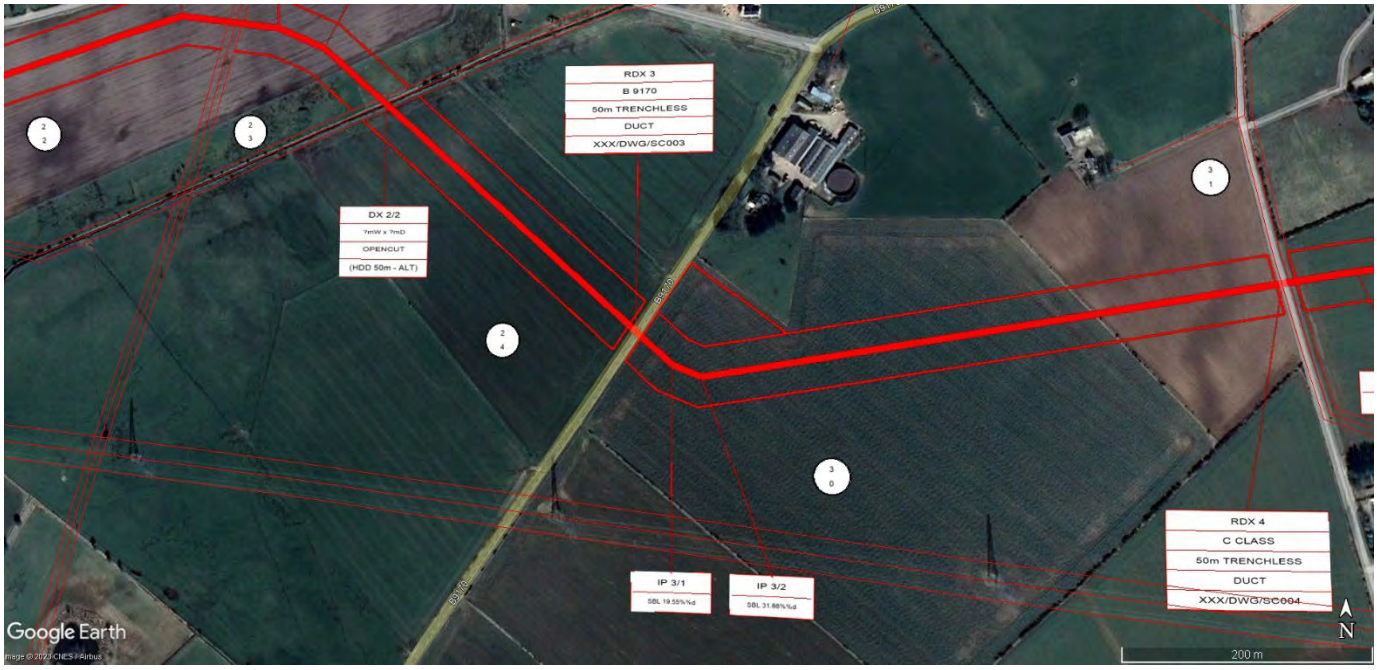
A number of proposed Mobilisation Areas have been identified along the route of the cable.

These Mobilisation areas would serve a variety of functions depending upon the construction programme. Early in the construction sequence they may be utilised to offload plant and materials to allow access to the right of way. Once the access is established, and right of way operations are underway. The mobilisation area may be used to temporarily store construction materials, such as fence posts or drainage stone which are used by the right of way and drainage crews. When pipe delivery and stringing commence, these mobilisation areas may be used as offload points for Pipe and fittings. Dependent upon schedule, delivery restrictions, and weather conditions, it may be necessary to temporarily stockpile pipe and material at the mobilisation areas, for use later on the right of way.

The Mobilisation areas will be sized according to the storage requirements of the particular area of the pipe route, but will be of an adequate size to temporarily store materials to service the requirements between mobilisation areas. The area will be stripped of topsoil, which will be stored in topsoil bunds, generally around the perimeter of the area, which will help to screen the site from the public, and improve security. Access to the road network will be provided by means of a Bell mouth which will be gated. To protect the access at the interface with the road, bog mats will be laid to protect the road edge, and any existing services. A stone road and apron will be laid on a geotextile membrane to provide an all-weather surface.

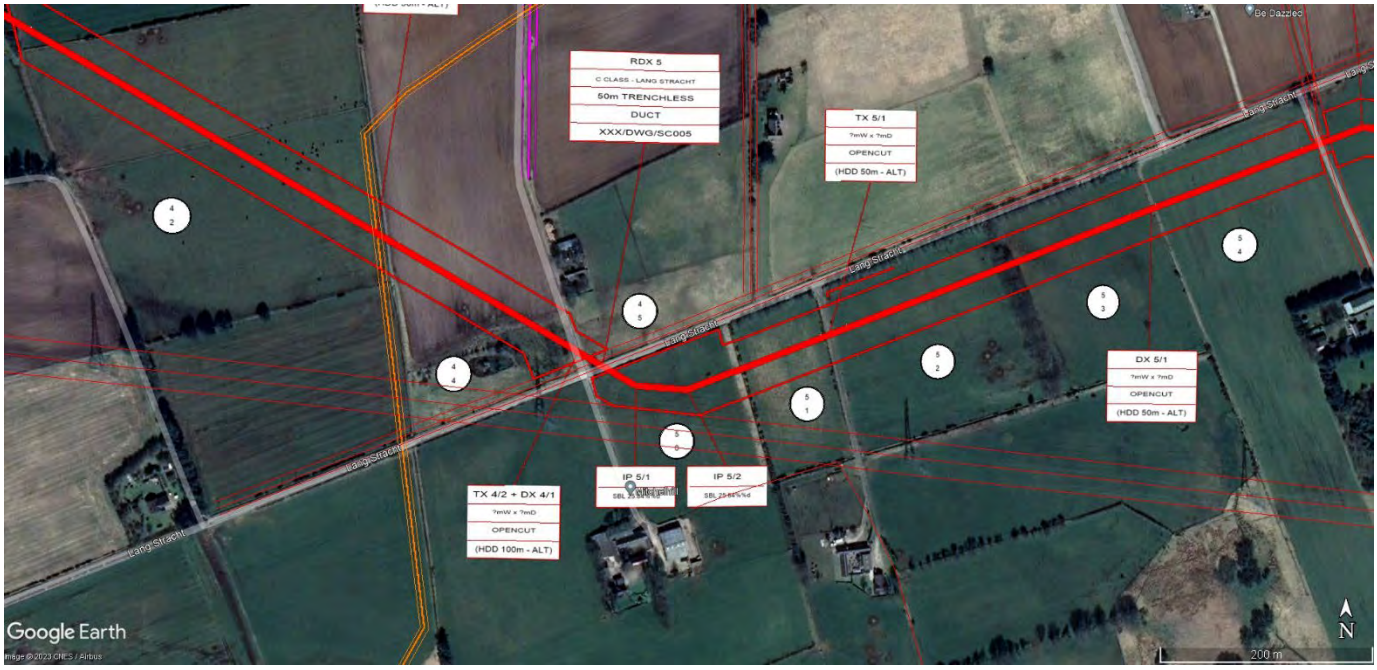
Off easement accesses are required in areas where the road network does not necessarily abut or adjoin the working area. Where this is the case, it is necessary to create off easement access to the site. This allows delivery of Plant, equipment and materials to the site, usually via an extension of the right of way to the closest public road or track way. These off-easement accesses are topsoil stripped and may have a stone running layer installed on geotextile membrane to maintain a good running surface and to allow for an all-weather surface.

## 7.5 PROPOSED MOBILISATION AREAS:



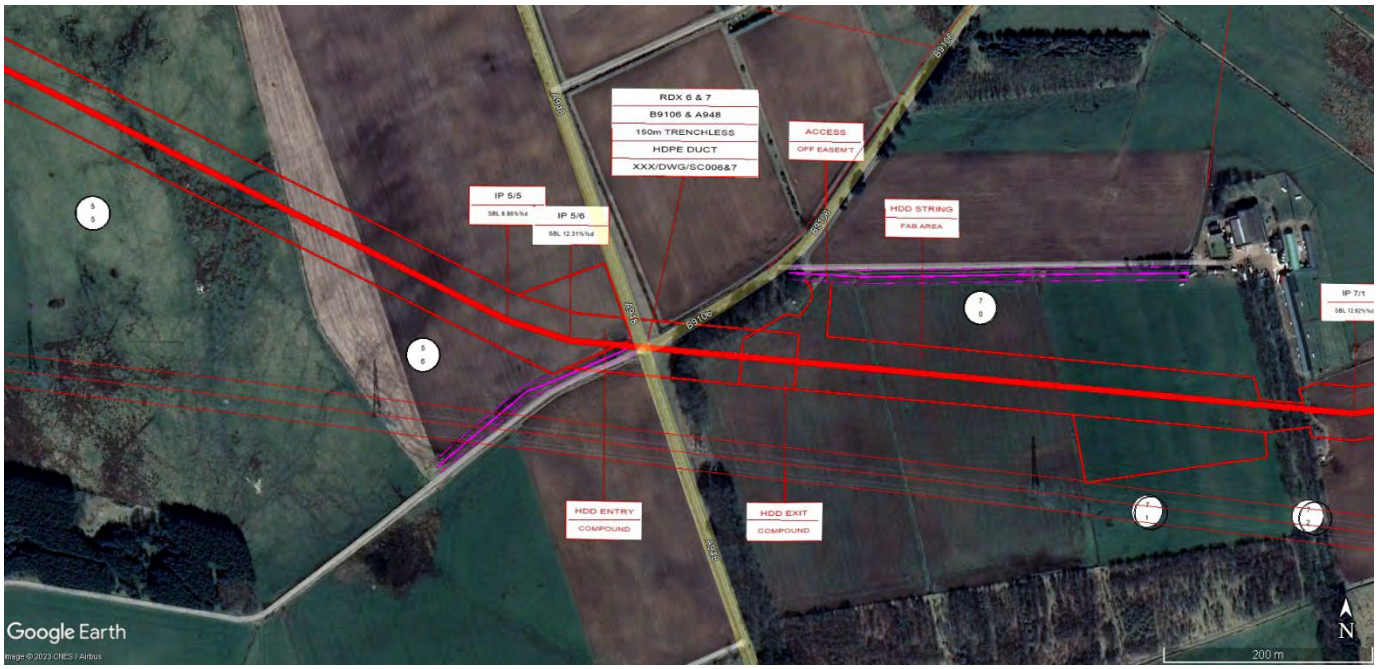

### 7.5.1 Storage & Mobilisation Area # 2

(RDX3, B9170, New Deer, Peterhead, AB3 6XJ)



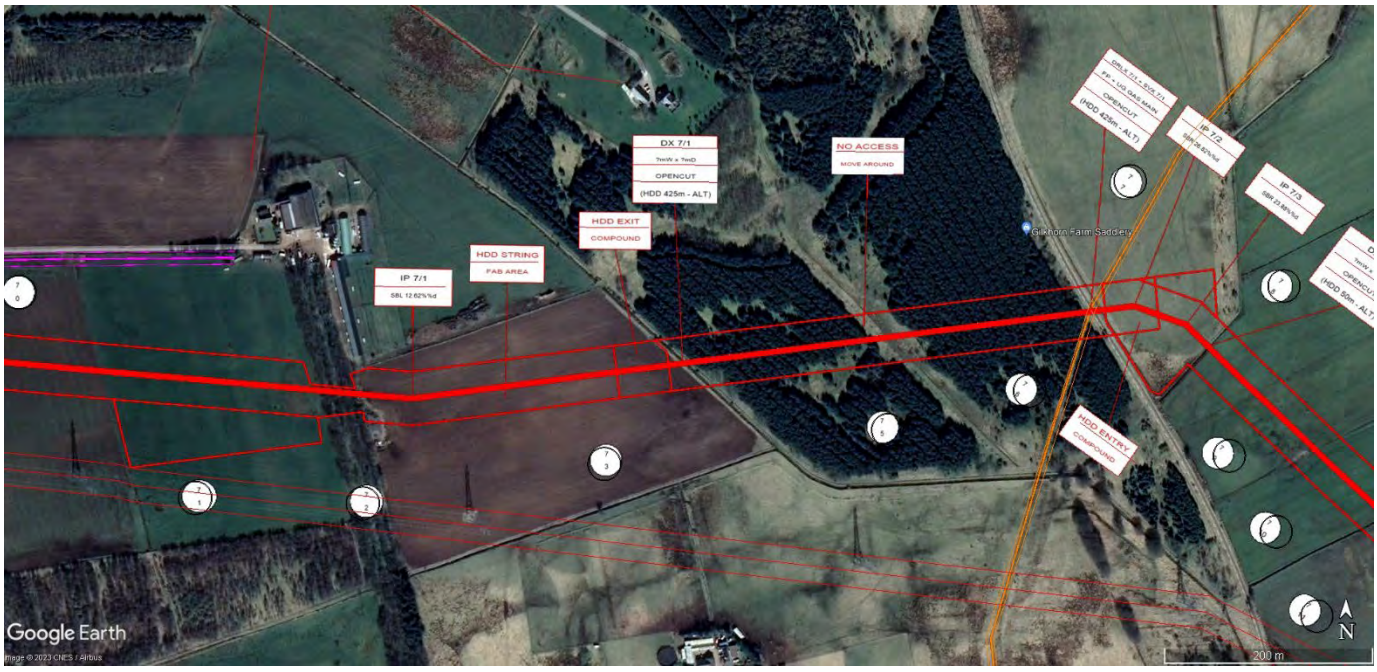

### 7.5.2 Storage & Mobilisation Area – RDX5 (Lang Stracht)

(RDX5, Lange Stracht, New Deer, Peterhead, AB41 5SN)



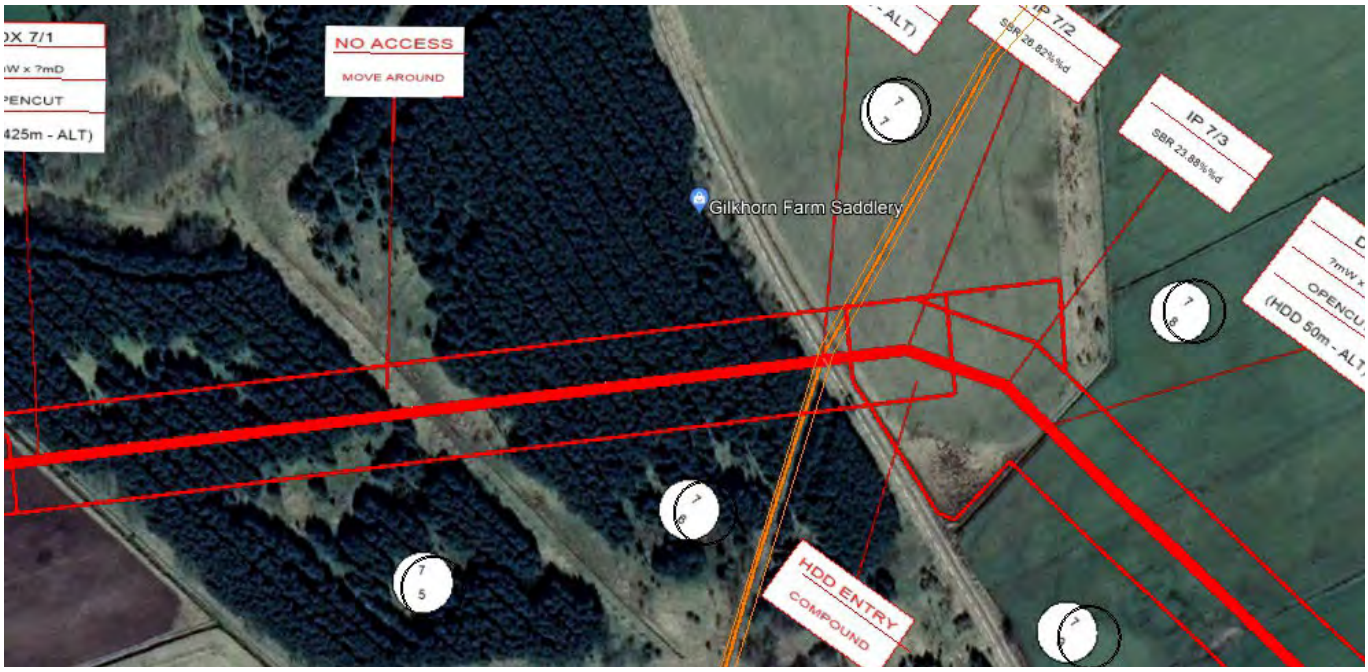

### 7.5.3 Storage & Mobilisation Area – RDX6/7 (A948/B9106)

(RDX 6/7, A948/B9106, New Deer, Peterhead, AB42 5RT)



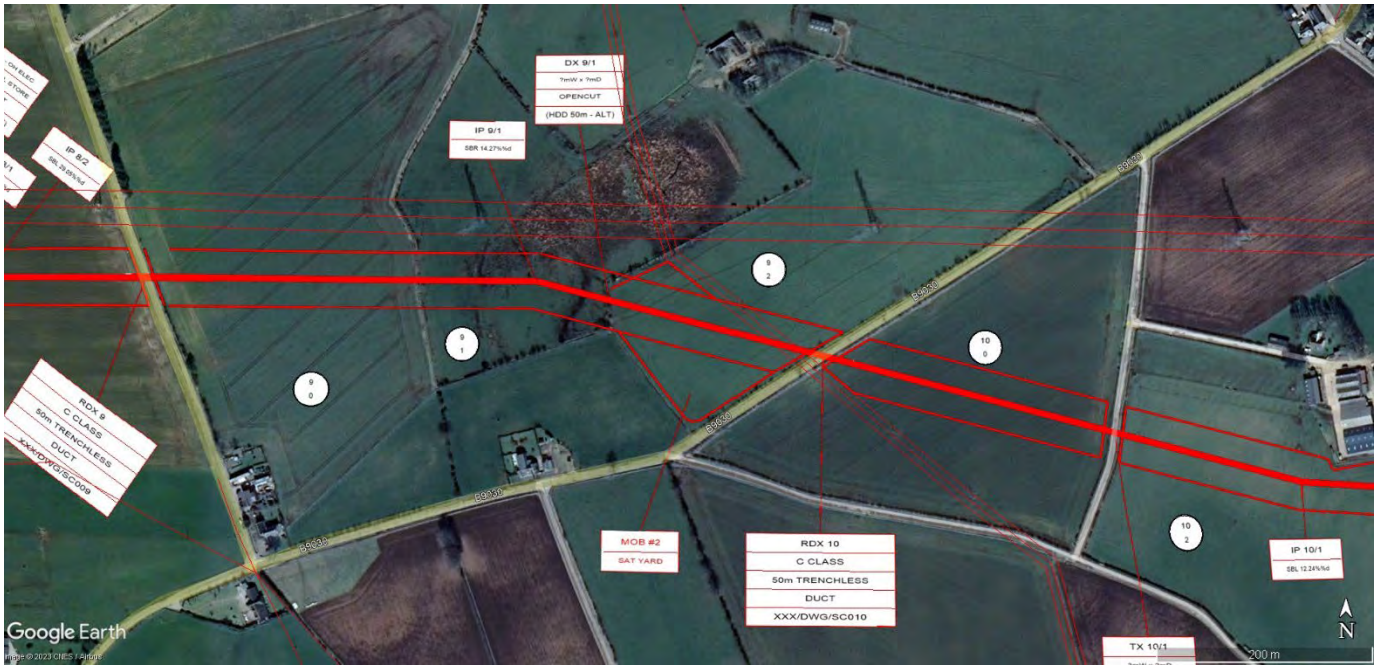

### 7.5.4 Storage & Mobilisation Area – DRLX7/1-ve

(RDX 6/7, A948/B9106, New Deer, Peterhead, AB42 5RT)




### 7.5.5 Storage & Mobilisation Area - DRLX7/1+ve

(RDX8, Woodside, New Deer, Peterhead, AB41 8UD)




### 7.5.6 Storage & Mobilisation Area RDX10-ve

(RDX10-ve, B9030, New Deer, Peterhead, AB41 6UN)

### 7.5.7 MOB#1 & MOB#4 – Mobilise Equipment and Materials for Entire Cable Route

All construction sites will have to carefully planned, set out and approved, to ensure the health safety and welfare of anybody that works there. Including access and egress, security etc.

It is important to note that the Main site yard will in all likelihood include temporary stores to house Dry store for perishable material, Quarantine compound for bunded materials etc. The main site yard will also have car parking area to accommodate the workforce and visitors, along with stores, offices, and canteen facilities.


## 7.6 MATERIALS GENERAL

It is likely that Materials will be stored as follows:

- MOBILISATION # 1 – Main Site yard and Access to ROW (New Deer) to RDX13+ve
- MOBILISATION # 2 – Mobilise Equipment and materials to RDX13 -ve to RVX14/1 -ve
- MOBILISATION # 3 – Mobilise Equipment and materials RVX14/1+ve to RDX15+ve
- MOBILISATION # 4 – Main Site yard and Access to ROW (Peterhead) RDX15+ve to RDX20+ve

Should Mobilisation areas be unavailable or insufficient to meet construction requirements then the Site Yard will accommodate Material and Equipment storage as required.

## 7.7 CONSTRUCTION SECTIONS

### 7.7.0 Section 0 / New Deer Substation - Overview


Construction works will commence at the New Deer Substation site, located to the south of the National Grid (New Deer), Substation (NGNDSS) on the west side of the road between Maryhill & Burnend of Gight.

The onshore cable route to the Landfall at Peterhead (North), exits Section 0, crossing RDX1 the Maryhill/Burnend of Gight road on a west / east heading. Due to the access requirements of this road, the OH Electric cables to the west side of the verge, and evidence of services buried in the verge(s), it is recommended that duct installation below the road would be best accomplished by trenchless methods. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Dependent upon the detailed design of RDX1, which will illustrate existing services, sizes, depths, materials in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 50m.

The Substation connection loop (SSCL) runs to the west side of the existing NGNDSS, before turning north, crossing the large OH Cables at the north west corner of the NGNDSS. Dependant upon site restriction due to the OH Electric cables, it may be prudent to consider this crossing for trenchless methodology. The Substation connection loop (SSCL) then turns sharp right as it enters the NGNDSS, perpendicular to the existing NGNDSS fence. Dependent upon topography and geology, it may be necessary to undertake minor cut and fill operations in this area, to provide a level ROW and Haul Road. It is likely that the Substation will have SIMOPS with the SSCL installation, and due consideration should be given to programming and access, so as to maintain efficient operations.

### 7.7.1 Section 1 - Overview


The onshore cable route to the Landfall at Peterhead (North), exits Section 0, crossing RDX1 the Maryhill/Burnend of Gight road on a west / east heading. Section 1 is generally flat to gently rolling topography, laid mainly to arable usage. Access roads are generally rural, narrow, farm access roads.

Immediately +ve (east) of RDX1, the route runs west/east before turning north. This is due to a dwelling located in the north west corner of the plot. This area will be the main site yard and office complex, with parking, storage (Covered/Uncovered), materials stockpiles, equipment storage etc. It has OH Electric cables to the south, east, and North boundaries. The cable ROW will be located to the north west corner of the main site yard and office complex, and securely fenced as separate to the site yard.

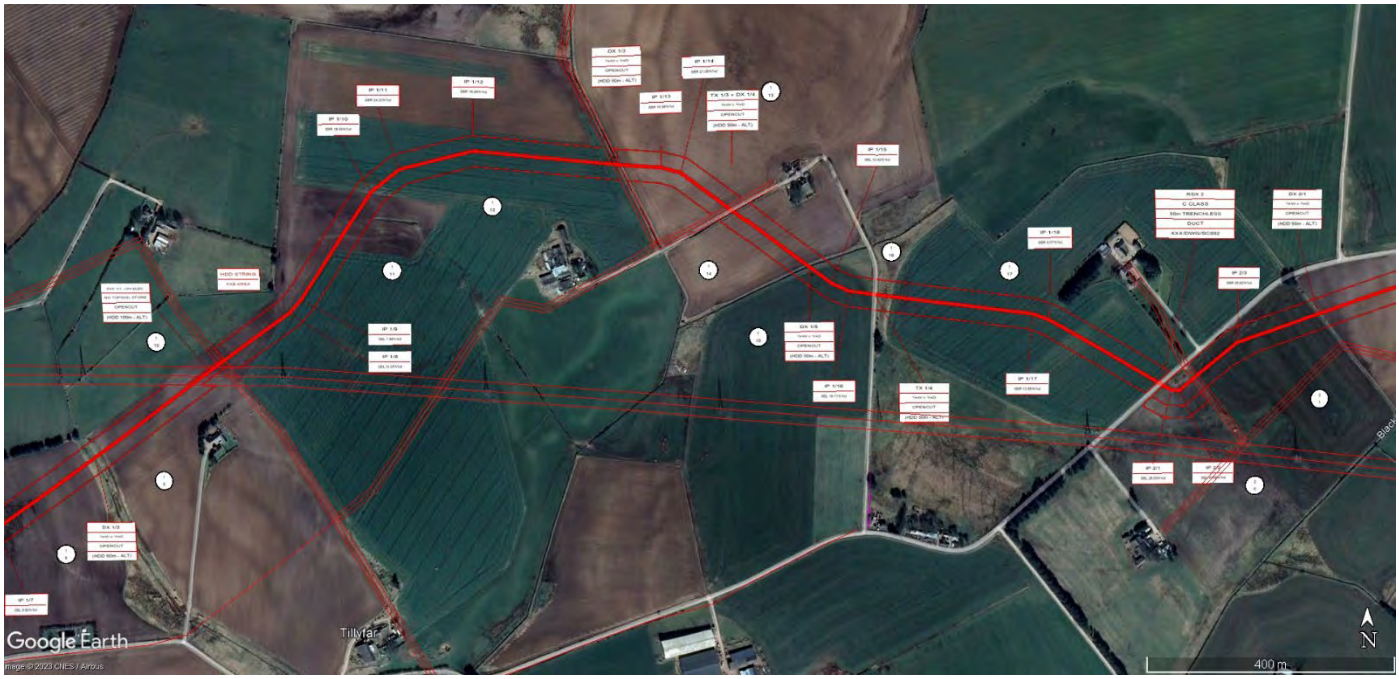
Once heading north, the ROW crosses private tracks, and OH Electric crossings, before heading east.

Where the route crosses DX 1/1 (Little Water), a temporary crossing method of the waterway will be required in order to maintain access throughout the ROW, and reduce site traffic movement form the public highway, through the introduction of move arounds/cul-de-sac working. The specific methodology for crossing the waterway will be in-line with project environmental commitments, access requirements, and engineering/cost benefit. A variety of methods may be employed such as flume and mat, Beam bridge, or Bailey bridge exist and are tried and tested methods of successfully crossing waterways in a variety of differing locations.

Dependent upon the detailed design of DX1/1, which will illustrate existing topography, channel profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 180m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed.

+ve of DX1/1 the ROW continues to head east, crossing private tracks, ditches and OH Electric crossings.

### 7.7.2 Section 1 – Overview (cont'd)




Section 1 is generally flat to gently rolling topography, laid mainly to arable usage. Access roads are generally rural, narrow, farm access roads.

At SVX1/1 (Service crossing – OH Electric cables) the route crosses below two sets of OH Electric cables. Extra working area will be required for this crossing, as topsoil from below the cables will be stored outside of the quarantine zone below the overhead cables. This is dependent upon the detailed design of the crossings, will illustrate existing topography, channel profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 180m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed.

Continuing east, the ROW crosses private tracks, and OH Electric crossings, before crossing RDX2 (Road crossing) .

Where the route crosses existing watercourses, a temporary crossing method of the waterway will be required in order to maintain access throughout the ROW, and reduce site traffic movement form the public highway, through the introduction of move arounds/cul-de-sac working. The specific methodology for crossing the waterway will be in-line with project environmental commitments, access requirements, and engineering/cost benefit. A variety of methods may be employed such as flume and mat, Beam bridge, or Bailey bridge exist and are tried and tested methods of successfully crossing waterways in a variety of differing locations.

### 7.7.3 Section 2 - Overview


Section 2 is generally flat to gently rolling topography, laid mainly to arable & grazing usage. Access roads are generally rural, narrow, farm access roads.

At RDX2 (Road crossing) the route crosses to the +ve side into a relatively topographically flat/level field, which is laid mainly to grazing. Immediately +ve (east) of RDX2, the route runs west/east following the route of the road to the north. The field has a large OH Electric cable to the south, running West/east, with a smaller OH Electric cable running north west through the plot. Where the route crosses RDX2, subject to detailed design, will illustrate existing topography, road profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 50m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install RDX2 crossing from the +ve (south) side of RDX2, as -ve of RDX2 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. RDX2+ve has extra workspace, in order to accommodate road crossing operations.

A number of OH Cables, ditches and track are crossed before arriving at RDX3-ve.

Where the route crosses existing watercourses, a temporary crossing method of the waterway will be required in order to maintain access throughout the ROW, and reduce site traffic movement form the public highway, through the introduction of move arounds/cul-de-sac working. The specific methodology for crossing the waterway will be in-line with project environmental commitments, access requirements, and engineering/cost benefit. A variety of methods may be employed such as flume and mat, Beam bridge, or Bailey bridge exist and are tried and tested methods of successfully crossing waterways in a variety of differing locations. Liaison and consultation with SEPA/NS may be required to ensure that crossing methodologies adequately mitigate existing environmental constraints. RDX2 has extra workspace, in order to accommodate ROW access, for delivery of plant, equipment and materials.

### 7.7.4 Section 3 - Overview


Section 3 is generally flat to gently rolling topography, laid mainly to arable usage. Access roads are generally rural, narrow, farm access roads.

At RDX3 – B9170 (Road crossing) the route crosses to the +ve side into a topographically gently sloping field, which is laid mainly to arable. Immediately +ve (east) of RDX3, the route runs west/east. The field has a large OH Electric cable to the south, running West/east, with a smaller OH Electric cable running north/south at RDX4. Where the route crosses RDX3, subject to detailed design, will illustrate existing topography, road profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 50m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install RDX3 crossing from the -ve (south) side of RDX3, as +ve of RDX3 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. RDX3-ve has extra workspace, in order to accommodate road crossing operations.

No OH Cables, ditches and tracks are crossed before arriving at RDX4-ve.

RDX3 has extra workspace, in order to accommodate ROW access, for delivery of plant, equipment and materials.

### 7.7.5 Section 4 - Overview


Section 4 is generally flat to gently rolling topography, laid mainly to arable & grazing usage. Access roads are generally rural, narrow, farm access roads.

At RDX4 (Road crossing) the route crosses to the +ve side into a relatively topographically flat/level field, which is laid mainly to arable. Immediately +ve (east) of RDX4, the route runs northwest/south east in order to avoid an area of habitable dwellings. The section has a large OH Electric cable to the south, running West/east, with a smaller OH Electric cable running along the road edge at RDX5. Where the route crosses RDX4, subject to detailed design, will illustrate existing topography, road profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 50m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is possible to install RDX3 crossing from either side of RDX3, as RDX3 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment.

No OH Cables, ditches and tracks are crossed before arriving at RDX5-ve.

TX4/1-ve has extra workspace, in order to accommodate the shallow angle of crossing the existing track.

SVX4/1-ve (Gas pipeline Ø TBC) will be subject to agreement of crossing methodology with asset owner, which is likely to be trenchless methodology.

RDX4 has extra workspace, in order to accommodate ROW access, for delivery of plant, equipment and materials.

### 7.7.6 Section 5 - Overview


Section 5 is generally flat topography, laid mainly to arable & grazing usage. Access roads are generally rural, narrow, farm access roads.

At RDX5 (Road crossing) the route crosses to the +ve side into a relatively topographically flat/level field, which is laid mainly to grazing. Immediately +ve (east) of RDX5, the route runs northwest in order to avoid an area of habitable dwellings. The section has a large OH Electric cable immediately to the south, running West/east, with a smaller OH Electric cable running along the road edge at RDX5. Where the route crosses RDX5, subject to detailed design, will illustrate existing topography, road profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 100m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install RDX5 crossing from the +ve (south) side of RDX5, as -ve of RDX5 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. RDX5+ve has extra workspace, in order to accommodate road crossing operations, in close proximity to the large OH Electric cables.

A number OH Cables, ditches and tracks are crossed before arriving at RDX5-ve.

RDX5 has extra workspace, in order to accommodate ROW access, for delivery of plant, equipment and materials. RDX5 has an existing pond in close proximity to the -ve side (west), which will require protection from fluvial run-off. RDX is a "pinch point" due to the proximity of OH Electric cables, existing road position, and crossing angle.

### 7.7.7 Section 6/7 - Overview

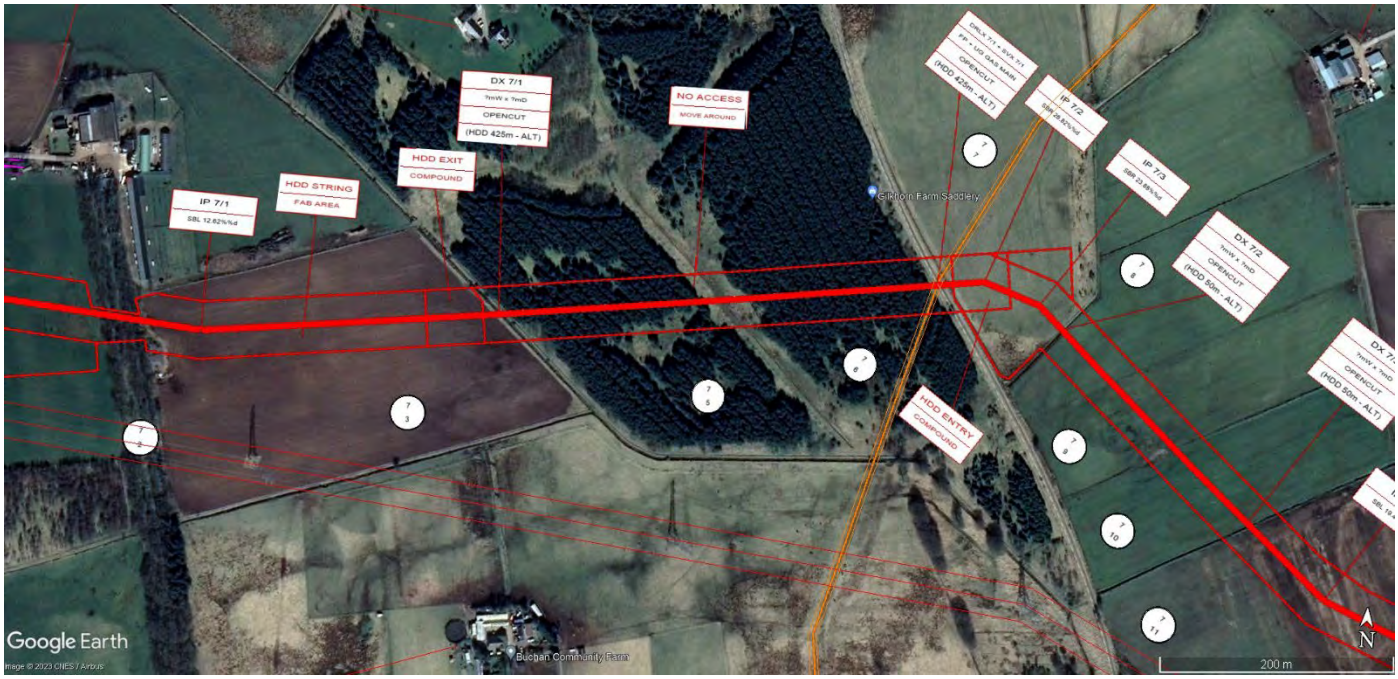

Section 7 is generally flat topography, laid mainly to arable, grazing, and forestry usage. Access roads are generally rural, narrow, farm access roads.

At RDX6/7 – B9106/A948 (Road crossings) the route crosses to the +ve side into a relatively topographically flat/level field, which is laid mainly to grazing. The section has a large OH Electric cable immediately to the south, running West/east, with a smaller OH Electric cable running along the road edge at RDX6/7. Where the route crosses RDX6/7, subject to detailed design, will illustrate existing topography, road profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 150m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install RDX6/7 crossing from the -ve (north) side of RDX6/7, as +ve of RDX6/7 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. RDX6/7+ve has extra workspace, in order to accommodate road crossing operations.

A number OH Cables, ditches and tracks are crossed before arriving at RDX8-ve.

RDX6/7 has extra workspace, in order to accommodate ROW access, for delivery of plant, equipment and materials. RDX5 has an existing protected mature woodland planting strip immediately -ve of the RDX6/7, in close proximity to the +ve side (east), which will require protection from construction operations. RDX6/7 will require an off-easement access, unless a sufficiently large gap can be found in the protected Woodland strip, providing a natural access point to the ROW. It will be necessary to cross plant and equipment at this road using the OEA (Off easement access) and placing plant and equipment on low loaders or trailers.

### 7.7.7 Section 7 – DRLX7/1




Section 7 is generally flat topography, laid mainly to arable, grazing, and forestry usage. Access roads are generally rural, narrow, farm access roads.

From DX 7/1 through to DRLX 7/1 – A dismantled railway which has been converted to a public footpath, the route crosses to the +ve side into a relatively topographically flat/level field, which is laid mainly to Forestry. Immediately +ve (east) of DRLX 7/1, the route crosses an existing underground pipeline, then runs southeast. Current crossing length, using HDD methodology, would be in the region of 425m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install DRLX 7/1 crossing from the +ve (east) side of DRLX 7/1, as -ve of DX 7/1 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. DRLX 7/1+ve has extra workspace, in order to accommodate crossing operations.

DRLX 7/1 will be a "No Access" / "Lock out" / "Cul-de-sac" section, as the proposed crossing method of the DRLX, Protected woodland, and other environmental constraints, will be trenchless. This negates the need for a ROW through the protected woodlands. Therefore, it will be necessary to mobilise from RDX6/7 and RDX8 respectively.

The depth of the bore path will be a minimum of 1m below the existing tree root level, which will be no greater than 2m below existing ground level, giving a minimum cover to the ducts of 3m below ground level in areas populated by trees.

A number OH Cables, ditches and tracks are crossed before arriving at RDX8-ve.

### 7.7.7 Section 7 - Overview


Section 7 is generally flat topography, laid mainly to arable, grazing, and forestry usage. Access roads are generally rural, narrow, farm access roads.

From the +ve side of DRLX7/1 the route continues into a section of relatively topographically flat/level ground, which is laid mainly to arable & grazing. The section has a large OH Electric cable immediately to the south, running West/east. Immediately +ve (east) of DRLX 7/1, the route runs west, before crossing below the large OH Electric cables twice in quick succession ("pinch point") in order to avoid a habitable dwelling to the north. Where the route crosses the large OH Electric cables – SVX 7/1 & 7/2, subject to detailed design, will illustrate existing topography, ground profile, depths in section, along with the trenchless bore path.

Current crossing length, using HDD methodology, would be in the region of 100m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install SVX 7/1 crossing from the +ve (south) side of SVX 7/1& 7/2, as +ve of SVX 7/1 & 7/2 have sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. SVX 7/1 +ve has extra workspace, in order to accommodate crossing operations.

Trenchless operations for both OH Electric cable crossings will be undertaken from the south side of the OH Cables. As one crossing is installed, the equipment will be re-oriented to install the second H Cable crossing.

A number OH Cables, ditches and tracks are crossed before arriving at RDX8-ve.

### 7.7.7 Section 7 - Overview


Section 7 is generally flat topography, laid mainly to arable, and grazing. Access roads are generally rural, narrow, farm access roads.

From the +ve side of SVX7/2 the route continues into a section of relatively topographically flat/level ground, which is laid mainly to arable & grazing. The section has a large OH Electric cable immediately to the south, running West/east. The route runs west, with the ROW restricted to the north by OH Electric cables running parallel to the working area. Extra area around this pinch point in the ROW has been identified, as stripped Topsoil will not be located below the OH Cables.

Where the route crosses RDX8, subject to detailed design, will illustrate existing topography, ground profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 50m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed.

Due to route configuration, it is proposed to install RDX8 crossing from either side of RDX8, as both sides have sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. RDX2+ve has extra workspace, in order to accommodate road crossing operations.

A number OH Cables, ditches and tracks are crossed before arriving at RDX8-ve.

### 7.7.8 Section 8 - Overview


Section 8 is generally flat topography, laid mainly to arable. Access roads are generally rural, narrow, farm access roads.

Immediately +ve (east) of RDX8, the route runs west/east before turning north to cross RDX 9. This is to avoid working in proximity to the property located to the north west of the current RDX9.

Where the route crosses the large OH Electric cables, extra area has been allocated to allow for topsoil storage outside of the OH Cable quarantine zone.

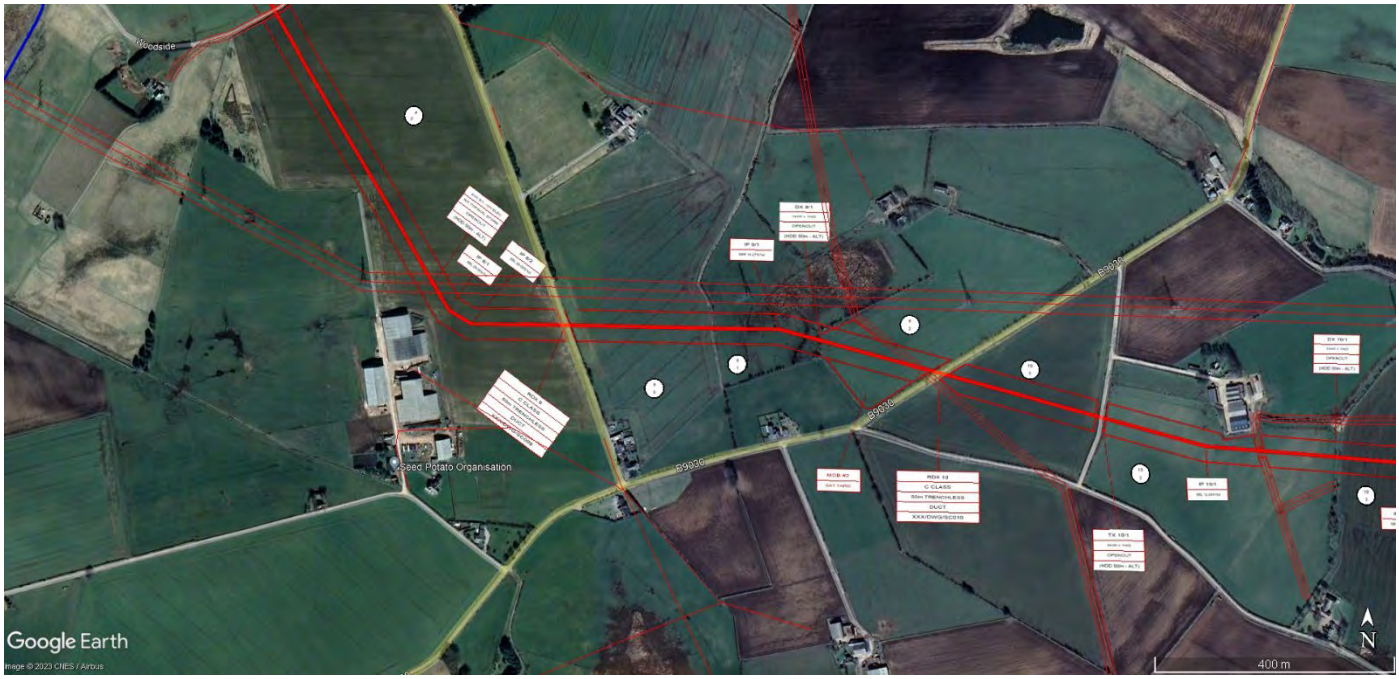
Where the route crosses RDX8 – Woodside, if undertaken by opencut methods, would involve a road closure, with resultant traffic management, including diversions. Open cut operations would be undertaken by the mainline trenching crew, with trench(es) cut through the road, Ducting installed, backfilled, and a temporary running surface installed, with the final road finish completed following completion of all opencut roads. Opencut of public roads for installation of infrastructure is usually reserved for minor roads and tracks. Large highways are usually installed with trenchless techniques, in order to minimise disruption.

Dependant upon the prevailing constraints, it may be possible to install the opencut road crossing without closing the highway for 1-2 days. It is common practice to utilise road plates and traffic control once the trench has crossed the road way.

Dependent upon the detailed design of RDX8, which will illustrate existing topography, channel profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 50m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed.

No OH Cables, are crossed before arriving at RDX9-ve.

### 7.7.9 Section 9 - Overview




Section 9 is generally flat topography, laid mainly to grazing and arable. Access roads are generally rural, narrow, farm access roads.

Immediately +ve (east) of RDX9, the route runs west/east before reaching RDX10-ve. This is due to the large OH Electric cables running parallel to the route, and north of the route. Where the route crosses RDX9, if undertaken by opencut methods, would involve a road closure, with resultant traffic management, including diversions. Open cut operations would be undertaken by the mainline trenching crew, with trench(es) cut through the road, Ducting installed, backfilled, and a temporary running surface installed, with the final road finish completed following completion of all opencut roads. Opencut of public roads for installation of infrastructure is usually reserved for minor roads and tracks. Large highways are usually installed with trenchless techniques, in order to minimise disruption.

Dependent upon the prevailing constraints, it may be possible to install the opencut road crossing without closing the highway for 1-2 days. It is common practice to utilise road plates and traffic control once the trench has crossed the road way, and the ducts installed.

Dependent upon the detailed design of RDX9, which will illustrate existing topography, channel profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 50m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed.

At RDX10-ve, an area has been allocated as a mobilisation area, in order to allow for deliveries and storage of plant, equipment and materials required for the construction activities. The cable ROW will be located to the north east corner of the mobilisation area, and securely fenced as separate to the MOB Area.

A number OH Cables, ditches and tracks are crossed before arriving at RDX10-ve.

### 7.7.10 Section 10 - Overview


Section 10 is generally flat topography, laid mainly to arable. Access roads are generally rural, narrow, farm access roads.

Immediately +ve (east) of RDX10, the route runs west/east before reaching RDX11-ve. This is due to the large OH Electric cables running parallel to the route, and north of the route. Where the route crosses RDX10, due to the OH Electric cable crossing perpendicular to the road, and the GVEC cable crossing angle of intersect, of road and OH Electric cables, it is proposed that this crossing be installed using trenchless methods.

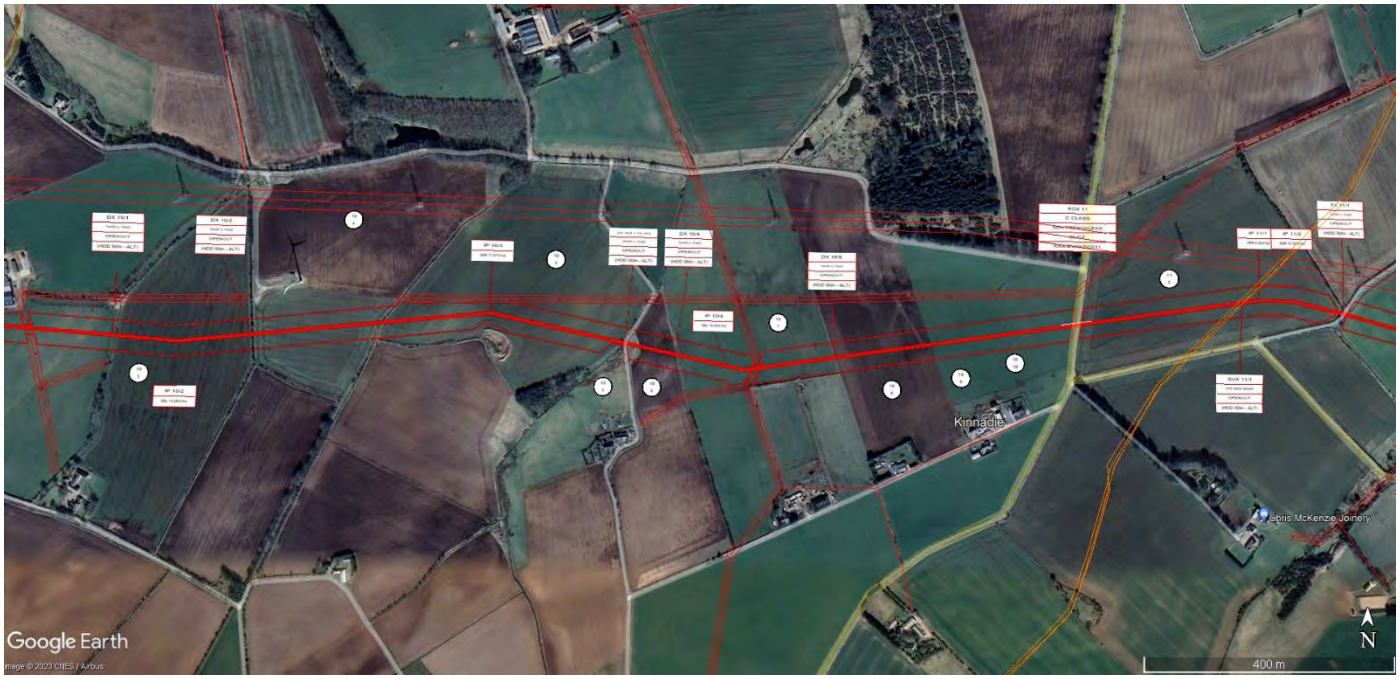
Dependent upon the detailed design of RDX10, which will illustrate existing topography, channel profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 50m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed.

At RDX10-ve, an area has been allocated as a mobilisation area, in order to allow for deliveries and storage of plant, equipment and materials required for the construction activities. The cable ROW will be located to the north east corner of the mobilisation area, and securely fenced as separate to the MOB Area.

RDX10+ve has a restricted ROW due to the shallow angle crossing of the cable route. Due to route configuration, it is proposed to install RDX10 crossing from the +ve side of RDX10, as the -ve side has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment.

A number OH Cables, ditches and tracks are crossed before arriving at RDX11-ve.

### 7.7.10 Section 10 – Overview (Cont'd)




Section 10 is generally flat topography, laid mainly to arable. Access roads are generally rural, narrow, farm access roads.

Toward the centre of the section, the route passes a pinch point with reduced ROW, as the large OH Electric cables run west/east to the north of the GVEC cable route. To the south, a small disused quarry has been identified as having a live badger set (as of 21/05/23). This pinch point can be mitigated by extra working area either side of the pinch point.

With the majority of the proposed cable route crossing land predominantly used for arable cultivation, it will be necessary to design and install pre-construction, cross-connection, and post construction drainage schemes. This will assist in maintaining existing drainage schemes for the duration of the construction period, and following the construction period. Close liaison with Client/Landowner/Contractor will be required during the drainage installation phase.

A number OH Cables, ditches and tracks are crossed before arriving at RDX11-ve.

### 7.7.11 Section 11 - Overview


Section 11 is generally flat topography, laid mainly to arable usage. Access roads are generally rural, narrow, farm access roads.

From the +ve side of RDX11 the route continues into a section of relatively topographically flat/level ground, which is laid mainly to arable & grazing. The section has a large OH Electric cable immediately to the north, running West/east. Immediately +ve (east) of RDX11, the route runs west, before crossing below an existing underground gas pipeline, subject to detailed design, will illustrate existing topography, ground profile, depths in section, along with the trenchless bore path.

Current crossing length, using HDD methodology, would be in the region of 50m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install SVX 11/1 crossing from the +ve (east) side of SVX 11/1, as -ve of SVX 11/1 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. SVX 11/1 +ve has extra workspace, in order to accommodate crossing operations.

-ve of SVX11/1 extra working area has been allocated due to the 3 x OH Cable crossings in relatively close proximity. Where possible, the route crosses OH Cables located at watercourses, on an alignment that results in reducing the crossing of multiple constraints in the shortest length, in order to reduce risk, and maximise productivity. It is likely that such crossings are installed utilising trenchless methodology.

A number OH Cables, ditches and tracks are crossed before arriving at RDX12-ve.

### 7.7.11 Section 11 – Overview (Cont'd)


Section 11 is generally flat topography, laid mainly to arable usage. Access roads are generally rural, narrow, farm access roads.

At DX11/3 extra working area has been allocated due to the OH Cable & Watercourse crossing. Where possible, the route crosses OH Cables located at watercourses, on an alignment that results in reducing the crossing of multiple constraints in the shortest length, in order to reduce risk, and maximise productivity. It is likely that such crossings are installed utilising trenchless methodology.

Where the route crosses DX 11/3, a temporary crossing method of the waterway will be required in order to maintain access throughout the ROW, and reduce site traffic movement form the public highway, through the introduction of move arounds/cul-de-sac working. The specific methodology for crossing the waterway will be in-line with project environmental commitments, access requirements, and engineering/cost benefit. A variety of methods may be employed such as flume and mat, Beam bridge, or Bailey bridge exist and are tried and tested methods of successfully crossing waterways in a variety of differing locations.

Current crossing length, using HDD methodology, would be in the region of 50m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install SVX 11/1 crossing from the -ve (west) side of DX11/3, as +ve of DX11/3 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. DX11/3 -ve has extra workspace, in order to accommodate crossing operations.

A number OH Cables, ditches and tracks are crossed before arriving at RDX12-ve.

### 7.7.12 Section 12 - Overview


Section 12 is generally flat topography, laid mainly to arable usage. Access roads are generally rural, narrow, farm access roads.

Where the route crosses DX 12/1, a temporary crossing method of the waterway will be required in order to maintain access throughout the ROW, and reduce site traffic movement form the public highway, through the introduction of move arounds/cul-de-sac working. At DX12/1 extra working area has been allocated due to the Watercourse crossing. The specific methodology for crossing the waterway will be in-line with project environmental commitments, access requirements, and engineering/cost benefit. A variety of methods may be employed such as flume and mat, Beam bridge, or Bailey bridge exist and are tried and tested methods of successfully crossing waterways in a variety of differing locations.

Current crossing length, using HDD methodology, would be in the region of 50m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to DX12/1 crossing from the +ve (west) side of DX12/1, as -ve of DX12/1 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. DX12/1 -ve has extra workspace, in order to accommodate crossing operations.

No OH Cables, ditches and tracks are crossed before arriving at RDX12-ve.

### 7.7.13 Section 13 - Overview


Section 13 is generally flat topography, laid mainly to arable usage. Access roads are generally rural, narrow, farm access roads.

At RDX13 – A958 (Road crossing) the route crosses to the +ve side into a relatively topographically flat/level field, which is laid mainly to arable. The section has no large OH Electric cables Where the route crosses RDX13, subject to detailed design, will illustrate existing topography, road profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 100m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install RDX13 crossing from the -ve (west) side of RDX13, as +ve of RDX13 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. RDX13 +ve has extra workspace, in order to accommodate road crossing operations.

RDX13+ve has extra workspace, in order to accommodate ROW access, for delivery of plant, equipment and materials. This area – Mobilisation area # 2 (MOB#2) is approximately 2.2ha (250m x 50m avg). It will be used for site mobilisation of plant, equipment and materials, along with welfare facilities. The ROW is located to the southern boundary of the work area.

Current crossing length, using HDD methodology, would be in the region of 100m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Due to route configuration, it is proposed to cross from the -ve (west) side of RDX13, as +ve of RDX13 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. RDX13 +ve has extra workspace, in order to accommodate crossing operations.  A number of OH Cables, ditches and tracks are crossed before arriving at RDX14-ve.

### 7.7.13 Section 13 - Overview


Section 13 is generally flat topography, laid mainly to arable usage. Access roads are generally rural, narrow, farm access roads.

-ve of RDX14 – A950 (Road crossing) the route runs west/east, crossing a number of OH Electric cables, running in close proximity to a dwelling. The route then passes through a pinch point crossing TX13/2. This pinch point is driven by environmental (Badger) constraints, as badger setts have been identified in the disused quarry to the south, and the woodland to the north. Extra working area has been allocated at this crossing to allow for crossing works.

Where the route crosses RDX14, subject to detailed design, will illustrate existing topography, road profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 150m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install RDX14 crossing from the -ve (west) side of RDX14, as +ve of RDX14 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. RDX14 -ve has extra workspace, in order to accommodate road crossing operations.

A number of OH Cables, ditches and tracks are crossed before arriving at RDX14-ve.

### 7.7.14 Section 14 - Overview


Section 14 is generally flat topography, laid mainly to arable usage. Access roads are generally rural, narrow, farm access roads. The centre of Section 14 contains the crossing of the south Ugie water. This consists of a large wetland area with a meandering river channel.

Due to the engineering and environmental constraints in the area of RVX14/1, it may not be possible to cross the south Ugie water with a temporary crossing method to maintain ROW through access. This will result in “lock out/cul-de-sac” working. Access for RVX14/1 +ve is via RDX14+ve. Access for RVX14/1+ve is from RDX15-ve.

Alternatively, where the route crosses RVX 14/1 (River south Ugie water)), a temporary crossing method of the waterway will be required in order to maintain access throughout the ROW, and reduce site traffic movement form the public highway, through the introduction of move arounds/cul-de-sac working.

Dependent upon the detailed design of RVX 14/1, which will illustrate existing topography, channel profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 535m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed.

Due to route configuration, it is proposed to install RVX14 crossing from the +ve (east) side of RVX14/1, as -ve of RVX14/1 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. It will be necessary to install the HDPE ducts in split strings, as the laydown area can accommodate a string length of approximately 350m only.

A number of OH Cables, ditches and tracks are crossed before arriving at RDX15-ve.

### 7.7.15 Section 15 - Overview


Section 15 is generally flat topography, laid mainly to arable usage. Access roads are generally rural, narrow, farm access roads.

+ve of RDX 15, the route crosses DX15/1, and DRLX15/1. Being a public footpath, the dismantled railway will be crossed using trenchless methodology. RDX15 & DX15/1 are also proposed as trenchless installation. Due to the proximity of RDX15, DX15/1 & DRLX15/1, it may be more efficient for these individual crossings to be combined into a single crossing.

Due to the engineering and environmental constraints in the area of DRLX15/1, it may not be possible to cross the DX15/1 & DRLX15/1 with a temporary crossing method to maintain ROW through access. This will result in “lock out/cul-de-sac” working. DRLX15/1 -ve is via RDX15+ve. Access for DRLX15/1 +ve is from RDX16-ve.

Alternatively, where the route crosses DX15/1, a temporary crossing method of the waterway will be required in order to maintain access throughout the ROW, and reduce site traffic movement form the public highway, through the introduction of move arounds/cul-de-sac working.

Dependent upon the detailed design of DRLX15/1, which will illustrate existing topography, channel profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 520m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed.

Due to route configuration, it is proposed to install DRLX15/1 crossing from the +ve (east) side of DRLX15/1, as -ve of RDX15 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment.

A number of OH Cables, ditches and tracks are crossed before arriving at RDX16-ve.

### 7.7.16 Section 16 - Overview


Section 16 is generally flat topography, laid mainly to arable and grazing usage. Access roads are generally rural, narrow, farm access roads.

+ve of RDX 16, the route crosses RVX16/1 – North Ugie water. RDX16 & DX16/1 are also proposed as trenchless installation. Due to the proximity of RDX16, DX16/1 & TX16/1, it may be more efficient for these individual crossings to be combined into a single crossing.

Due to the engineering and environmental constraints in the area of RVX16/1, it may not be possible to cross the North Ugie water with a temporary crossing method to maintain ROW through access. This will result in “lock out/cul-de-sac” working. RVX16/1 -ve is via RDX16+ve. Access for RVX16/1 +ve is from RDX17-ve.

Alternatively, where the route crosses RVX16/1, a temporary crossing method of the waterway will be required in order to maintain access throughout the ROW, and reduce site traffic movement form the public highway, through the introduction of move arounds/cul-de-sac working.

Dependent upon the detailed design of RVX16/1, which will illustrate existing topography, channel profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 300m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed.

Due to route configuration, it is proposed to install RVX16/1 crossing from the -ve (east) side of RVX16/1, as -+ve of RVX16/1 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment.

A number of OH Cables, ditches and tracks are crossed before arriving at RDX17-ve.

### 7.7.16 Section 16 – Overview (Cont'd)


Section 16 is generally flat topography, laid mainly to arable and grazing usage. Access roads are generally rural, narrow, farm access roads.

Due to the engineering and environmental constraints in the area of RVX16/1, it may not be possible to cross the North Ugie water with a temporary crossing method to maintain ROW through access. This will result in "lock out/cul-de-sac" working. RVX16/2 -ve is via RDX16+ve. Access for RVX16/2 +ve is from RDX17-ve. Unfortunately, the RVX16/1 crossing may also require a "Move around/Cul-de-sac" working. Therefore, either RVX16/1 or RVX16/2 (or both) will require through access (Watercourse temporary crossing) to maintain access to the ROW.

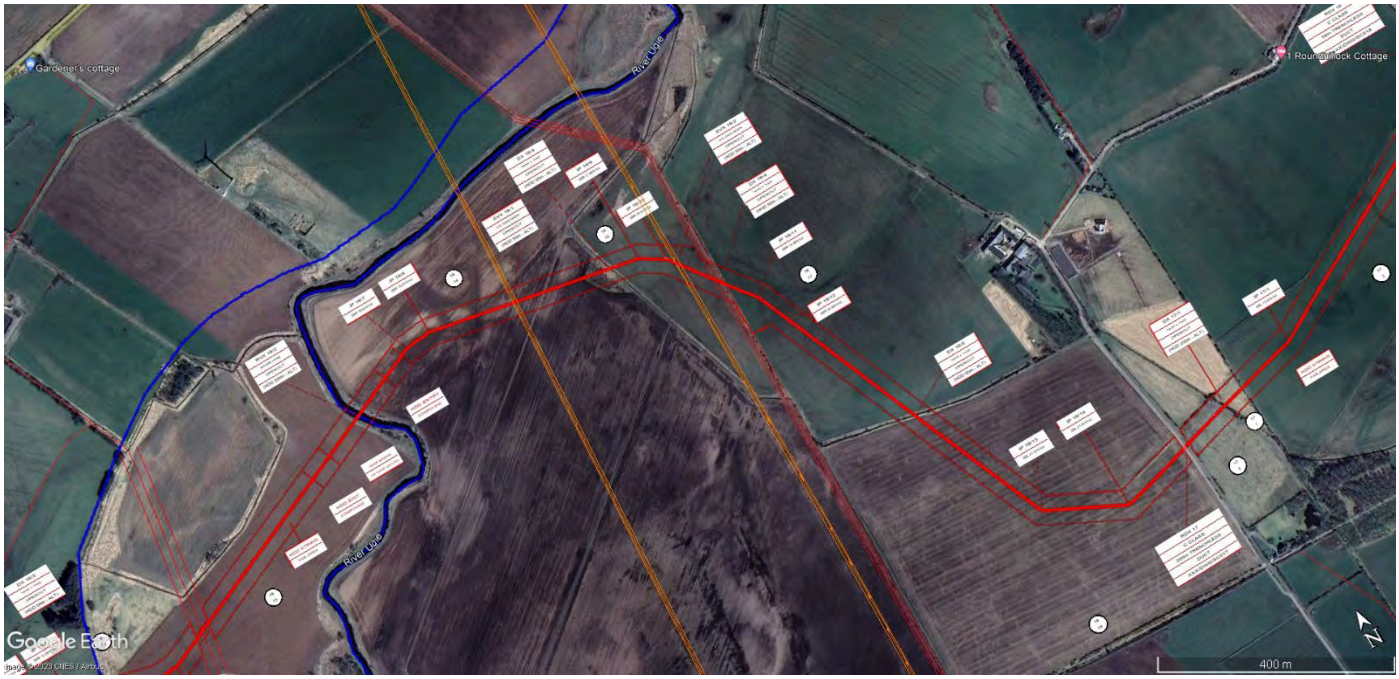
Where the route crosses RVX16/2, a temporary crossing method of the waterway will be required in order to maintain access throughout the ROW, and reduce site traffic movement form the public highway, through the introduction of move arounds/cul-de-sac working.

Dependent upon the detailed design of RVX16/2, which will illustrate existing topography, channel profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 200m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed.

Due to route configuration, it is proposed to install RVX16/2 crossing from the +ve (west) side of RVX16/2, as -ve of RVX16/2 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment.

A number of OH Cables, ditches and tracks are crossed before arriving at RDX17-ve.

### 7.7.16 Section 16 – Overview (Cont'd)




Section 16 is generally flat topography, laid mainly to arable and grazing usage. Access roads are generally rural, narrow, farm access roads.

At RVX16/1 the route crosses to the +ve side into a relatively topographically flat/level field, which is laid mainly to arable. The section has no large OH Electric cables.

Where the route crosses SVX13/1, subject to detailed design, will illustrate existing topography, road profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 50m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install SVX13/1 – Gas pipeline crossing from the +ve (east) side of SVX16/1, as -ve of SVX16/1 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. SVX16/1 +ve has extra workspace, in order to accommodate road crossing operations.

SVX16/2, & DX16/4 (inc: OH Electric cables), due to being in close proximity, may be combined into a single crossing in order to mitigate trenchless risk, and production efficiency.

Current crossing length, using HDD methodology, would be in the region of 150m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Due to route configuration, it is proposed to cross from the -ve (west) side of SVX16/2, as +ve of SVX16/2 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. SVX16/2 +ve has extra workspace, in order to accommodate crossing operations.

A number of OH Cables, ditches and tracks are crossed before arriving at RDX17-ve.

### 7.7.17 Section 17 - Overview

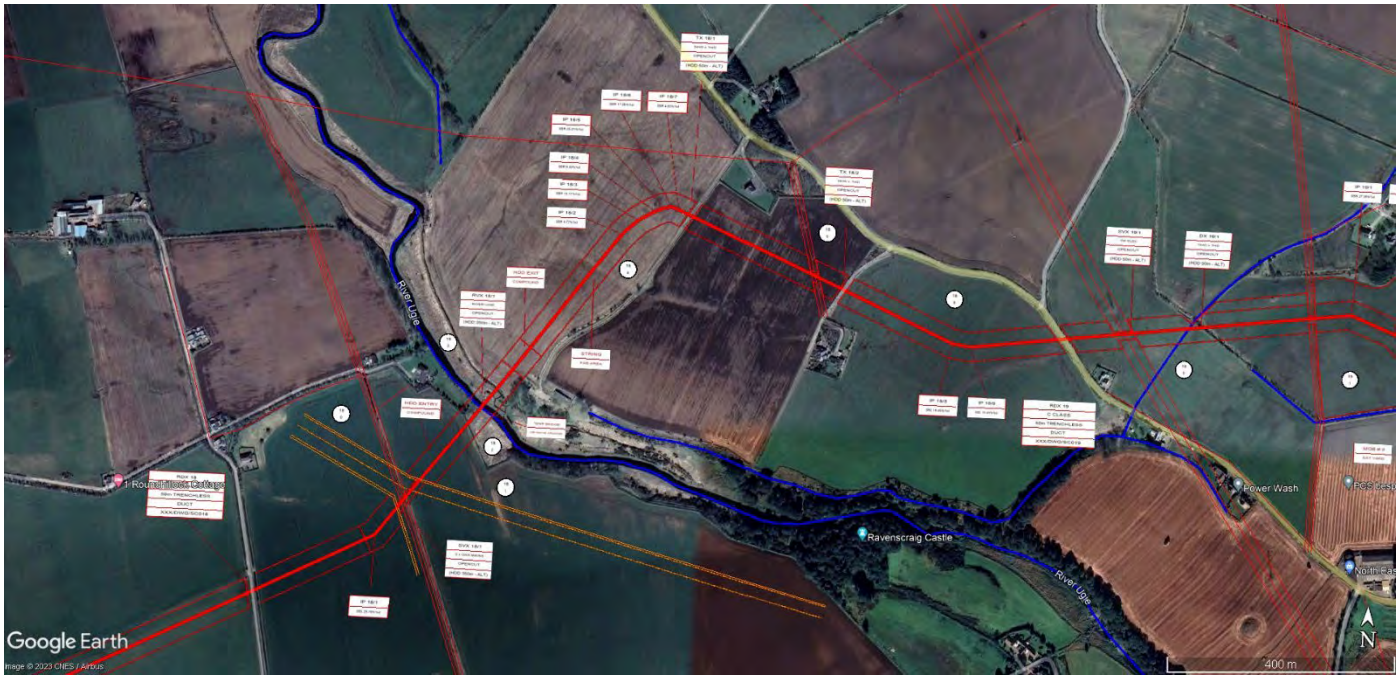

Section 17 is generally flat topography, laid mainly to arable and grazing usage. Access roads are generally rural, narrow, farm access roads.

+ve of RDX17, the route runs approximately west/east. RDX17, & DX17/1, due to being in close proximity, may be combined into a single crossing in order to mitigate trenchless risk, and production efficiency.

Current crossing length, using HDD methodology, would be in the region of 200m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m.

Due to route configuration, it is proposed to cross from the -ve (west) side of RDX17, as +ve of DX17/1 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. DX17/1 +ve has extra workspace, in order to accommodate crossing operations.

### 7.7.18 Section 18 - Overview




Section 18 is generally flat topography, laid mainly to arable and grazing usage. Access roads are generally rural, narrow, farm access roads.

At RVX18/1 the route crosses to the +ve side into a relatively topographically flat/level field, which is laid mainly to arable. The section has no large OH Electric cables. Section 18 also contains SVX18/1 – Gas pipeline x 3 / OH Electric cable, as well as RVX18/1 – River Ugie crossing.

RVX18/1, & SVX18/1 (inc: OH Electric cables), due to being in close proximity, may be combined into a single crossing in order to mitigate trenchless risk, and production efficiency.

Where the route crosses RVX18/1 + SVX18/1, subject to detailed design, will illustrate existing topography, road profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 400m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install RVX18/1+SVX18/1 the -ve (west) side of SVX18/1, as +ve of RVX18/1 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. SVX18/1 -ve has extra workspace, in order to accommodate crossing operations.

Due to the engineering and environmental constraints in the area of RVX18/1, it may not be possible to cross the Ugie water with a temporary crossing method to maintain ROW through access. This will result in “lock out/cul-de-sac” working. RVX18/1 -ve is via RDX18+ve. Access for RVX18/1 +ve is from RDX19-ve. Liaison and consultation with SEPA/NS may be required to ensure that crossing methodologies adequately mitigate existing environmental constraints.

A number of OH Cables, ditches and tracks are crossed before arriving at RDX19-ve.

### 7.7.19 Section 19 - Overview


Section 19 is generally flat topography, laid mainly to arable and grazing usage. Access roads are generally rural, narrow, farm access roads.

At RDX19 the route crosses to the +ve side into a relatively topographically flat/level field, which is laid mainly to arable. The section has large OH Electric cables.

RDX19, & SVX19/1 (OH Electric cables), due to being in close proximity, may be combined into a single crossing in order to mitigate trenchless risk, and production efficiency.

Where the route crosses RDX19, & SVX19/1 (OH Electric cables), subject to detailed design, will illustrate existing topography, road profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 200m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install RDX19, & SVX19/1 (OH Electric cables), from the -ve (west) side of RDX19, as +ve of SVX19/1 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. SVX19/1 -ve has extra workspace, in order to accommodate crossing operations.

-ve of RDX20, the route crosses the A90 road at the south east corner, in order to negate the need for adding a single landowner (field east of A90, north of the route). The -ve of RDX20 will be utilised as a mobilisation area. This area will/can be the main site yard and office complex, with parking, storage (Covered/Uncovered), materials stockpiles, equipment storage etc. It has OH Electric cables to the south, east, and North boundaries. The cable ROW will be located to the north west corner of the main site yard and office complex, and securely fenced as separate to the site yard.

A number of OH Cables, ditches and tracks are crossed before arriving at RDX20-ve.

### 7.7.20 Section 20 - Overview


Section 20 is generally rolling topography, laid mainly to arable and grazing usage. Access roads are generally rural, narrow, farm access roads.

At RDX20 the route crosses to the +ve side into a relatively topographically flat/level field, which is laid mainly to arable. The section has no large OH Electric cables.

At RDX20, the route crosses the A90 road at the south east corner of the plot, in order to negate the need for adding a single landowner (field east of A90, north of the route). The -ve side of RDX20 will be utilised as a mobilisation area. This area will/can be the main site yard and office complex, with parking, storage (Covered/Uncovered), materials stockpiles, equipment storage etc. It has OH Electric cables to the south, east, and North boundaries. The cable ROW will be located to the north west corner of the main site yard and office complex, and securely fenced as separate to the site yard.

Where the route crosses RDX20, subject to detailed design, will illustrate existing topography, road profile, depths in section, along with the trenchless bore path. Current crossing length, using HDD methodology, would be in the region of 50m-100m. Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs (“Ditch Witch”), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed. Due to route configuration, it is proposed to install RDX20 from the +ve (east) side of RDX20, as -ve of RDX20 has sufficient space to accommodate the stringing of the HDPE Duct fabrication and bore alignment. RDX20 -ve has extra workspace, in order to accommodate crossing operations.

Between RDX20+ve and the Landfall compound/End line (East), the route traverses a side slope which may require benching (cut and fill) operations in order to create a relatively level running track/haul road. This area will be utilised for stringing, fabrication and testing of the HDPE ducts to be installed at the landfall, likely to be trenchless (HDD). No OH Cables, ditches and tracks are crossed before arriving at the End line.

# 8 CONSTRUCTION METHODS

## 8.1 ROUTE SURVEY, SETTING OUT AND RECORD OF CONDITION

This work will be carried out by a team of surveyors and assistants under the leadership of a Senior Surveyor.

All survey information will, where possible, be computerised to aid production of the Construction and as Built Drawings.

The information for the 1:2500 and 1:10,000 Strip Maps, will be in digitised form. This will be used to generate the construction issue Plan and Profile long sections/strip maps and later will be updated to an As Built Issue.

The As Built Drawings will be submitted during the course of the work and will cover the whole of the cable route.

All information gained during setting out will be carefully stored for inclusion in the As Built records which form part of the As Built Data Books. Photographic records will be carried out during route survey and setting out of the works. Detailed records of the condition of the roads in the vicinity of the route will also be taken. Photographic records will also be taken of any features that are likely to be affected by the Project.

Once the centreline is set out (using GPS initially), the fence lines are pegged out in accordance with the working width and the relevant operational procedure. The pegged fence lines and centreline are then scanned using a cable avoidance tool (CAT) to confirm the positions of existing services and plant which are affected by the works. These services will be protected with Hi-Vis netlon fencing, Bunting (for overhead cables), warning signage and bog mat protection.

## 8.2 SITE ESTABLISHMENT

Initial operations will involve the possession and establishment of a main Site yard, followed by Mobilisation areas and off easement accesses. The Main Site Yard is accessed via the road leading to New Deer National Grid Substation, between Maryhill and Burnend of Gight. It is not known at the time of writing this report whether utilities for Power, Telecoms, and drainage are within proximity of the Main site yard and office compound.
A crew with sufficient resources will begin civilising of the site, which would include bunding of any existing topsoil, and ensuring the site is secure by erecting suitable fencing. Any existing services within the yard will be located and identified. These services will be protected with hi-vis netlon or bunting for overhead cables.

Once all services are marked, the site is cleared and secure, the yard will be surveyed, and a plan of the layout will be produced. An engineer/surveyor will then typically mark out with spray/pegs the locations of the following:

- Office cabins (Porta cabin)
- Dry Store shed (ISO Container)
- Coshh stores (ISO Container)
- Equipment stores (ISO Container)
- Diesel Bund (5000L Tank)
- Wash Bay (Jet wash)
- Office car parking (Marked bays)
- Plant parking
- Cable storage (sand bunds)
- Quarantine (Heras area)
- Civils Material store (Heras area)
- Mechanical materials store (Heras area)
- Welfare facilities (Portacabin / ISO Container)
- Security Cabin / Gatehouse (ISO Container)
- Waste/Refuse Area

Cabins will then be delivered and fitted according to the plan. Containers will then be delivered and placed according to the plan. Stores and storage areas will then be erected in line with the plan. When structures are in place, services will be connected as required. Once the main site yard is established, a number of crews with sufficient resources would go to the various Mobilisation areas along the cable route and begin to prepare these. This would typically involve breakthrough of hedges, erect site fence, topsoil strip, install stone apron, protect services, install bogmat protection, lay stone apron/track on geotextile membrane etc.

### 8.3 RIGHT OF WAY

The right of way preparation for the cable will generally consist of the following works:

- Erecting advance warning signs at road crossings in accordance with the Highway Specification and CLIENT detail design
- Breaking through the field boundary at the Main construction yard and office complex, making sure that services are well protected, and laying of bogmats/stone apron on the access, from the road into the field
- Erection of the site fencing, in line with the CLIENT detailed design
- Topsoil stripping and bunding in line with the CLIENT detailed design
- Preparation of the running track/haul road in line with the CLIENT detailed design
- Erecting goal posts and bunting across the spread at overhead cable locations. These govern the height at which plant can pass safely under the overhead electric cables or telecom wires
- Breaking through subsequent field boundaries
- Installation of watercourse crossings, using flume pipes to maintain uninterrupted flows
- Installation of clear span bridges where necessary (Beam Bridges / Bailey Bridges)
- Tree pruning and tree protection as instructed / agreed on Pre-Entry Forms.
- Excavation of trial holes to locate services and erecting location/ warning notices will be under a permit to dig.
- Excavation of trial holes to determine ground conditions, recorded by the site engineers under a permit to dig.
- Carrying out any preparatory work identified by the CLIENT or the CLIENT Lands Liaison Officer from any Notices or Orders intended for the preservation of hedges, trees, buildings or features within the right of way. Where required, a Bio-security zone may be installed to provide further protection.

Generally, the working width design allows for adequate working space, however, around certain crossings and dependent upon the crossing methodology, subject to ground topography and conditions, it may be necessary to re-engineer the fence lines. This will also be the case where the working width design shows boxes at crossings of overhead lines, or where the spread runs parallel to overhead lines, or existing underground services. Working Width drawings will detail with dimensions the required site land take. Security patrols will also be present on site.

## 8.4 BAILEY BRIDGES / BEAM BRIDGES / FLUMED CROSSINGS

During the preparation of the ROW, watercourse crossing will be encountered. Crossing methods will be assessed during detail design, and the relevant authorities (Local Authority, Environment Agency, Internal drainage board etc) consulted in order to agree a suitable method. Usually, the methods of watercourse crossing are as follows:

**Ditch or Grip**

Suitable Ø Flume Pipe / Spoil fill / Sandbag face / Bogmat running surface



**Minor Watercourse**

Suitable Ø Flume Pipe / Spoil fill / Sandbag face / Bogmat running surface

Beam Bridge / Stone ramp / Bogmat running surface



**Major Watercourse**

Beam Bridge / Stone ramp / Bogmat running surface

Bailey bridge / Stone ramp / Bogmat running surface


## 8.5 TEMPORARY FENCING

The fencing and right of way crew's work in very close proximity to one another, often within 0.5km. Prior to erecting the temporary fencing, the perimeter of the right of way will be defined, marked and checked for services using CAT and Genny, by the surveying teams. Fence posts will be distributed along the marked lines and driven into the ground, generally with an excavator bucket. Fencing for stock accesses will be installed at this time and topsoil strip will be carried out across them. Gates at road crossings, stock and other accesses, together with any required signs, will also be installed. The fencing crew foreman shall ensure that all service protection fencing and matting is in place when he passes through. The fencing will be suitably earthed with rods beneath overhead electric lines if it is required.

Where identified on the working width drawings, specific fencing will be installed, with demarcation fencing in arable areas, Stock fencing in cattle areas, Post and rail fencing in Horse areas, and Heras fencing/Hoarding in Urban/Security risk areas.



## 8.6 PRE-CONSTRUCTION / ACCOMMODATION WORKS DRAINAGE

Drainage for site yard, mobilisation areas and off easement accesses will be installed by a specialist sub-contractor in accordance with the design developed by the Drainage Engineer. This work will be carried out as soon as it is practically possible, to prevent deterioration of the working areas.

Generally, existing drainage will be investigated, cleaned out where required and repaired where necessary. Should further drainage be required to provide a drained working area, then this will be installed using either a 360° Backhoe or a Drainage trencher, depending upon the size of the area to be drained.

The ROW/Fencing crew and Pre-construction Drainage crew work in very close proximity to one another, often within 0.5km. Pre-construction Drainage will be installed by a specialist sub-contractor in accordance with the design developed by the Drainage Engineer. This work will be carried out as soon as it is practically possible, following erection of fences. Generally, Pre-construction drainage is installed to the “High” side of the ROW, using a drainage trenching machine. This is in order to provide a cut off or header drain which will divert the drained water from the existing drainage system which will be damaged during trenching operations prior to pipe installation. This prevents the cable trench from being inundated with water when excavated, and also protects the drainage system from damage when it is tracked over with plant and machinery across the ROW.




## 8.7 TOPSOIL STRIP

Every care will be taken to prevent topsoil and subsoil mixing and the work will be continuously monitored to ensure this is the case. Topsoil will be stripped to its full depth and records will be kept of the depths stripped in every parcel of land.

Track mounted 360-degree slew backhoe excavators (where appropriate) will pull the topsoil away from the left hand temporary fence far enough to allow a tracked dozer (CAT D8 or similar) to push and strip towards the right hand fence where it is stacked. Banksmen watch over the stacking heap to make sure that material does not get pushed outside the easement or damage the temporary fencing. The heap will be built neatly and left tidy and well shaped to ensure that it is both weatherproof and also to maximise the size of the working spread. Topsoil removed from the banks of watercourses and ditches will be stacked separately. Gaps will be left in the topsoil heap to permit the maintenance of public rights of way, water management and beneath all overhead cables. No stripping will take place over underground services. If required, side slope benching will be carried out to give a level running track and working platform along the side of the trench. When working in a flood plain is unavoidable, special measures will be discussed and agreed with the EA. These may include weather monitoring, topsoil wrapping, Emergency procedures, and fuel storage constraints.



## 8.8 CROSSINGS

### 8.8.1 Major Crossings

Currently, major crossings include:

DRLX7/1 (425m Trenchless)
RVX14/1 (535m Trenchless)
DRLX15/1 (250m Trenchless)
RVX16/1 (300m Trenchless)
RVX16/2 (200m Trenchless)
RVX18/1 (350m Trenchless)

Due to the length and diameter of some of these crossings, it is likely that an HDD Maxi rig will be utilised.

All other trenchless crossings (Road/Ditch/Service etc) will be undertaken by HDD micro rig.

During detail design, the Liaison Officer will contact all local and statutory Authorities, Private Companies and Agencies to obtain all consents, permits, licences and authorisation necessary to carry out the crossings. Each service will be located and marked with a notice, specifying the type, size and depth of the particular service. Each road/service crossing will be surveyed and for all main crossings, a construction drawing, detailed method statement and design calculations will be produced and where necessary submitted for Independent Design Check. After a schedule of crossing types has been ascertained, information will be transferred to the stripmaps. These will include but not be limited to road, rail, service and river crossings, as well as plot identifications and adverse ground conditions and other relevant constraints. All will be labelled on the drawing with a crossing technique and length.

The detailed method statement / procedure will include and address the following:

- Type of crossing (i.e., HDD, Auger Bore, Open Cut, Micro tunnel or other)
- Type of pit where required (i.e., Battered, supported, access considerations etc.)
- Dimensions (ØOD x Length), Material, Grade, Specification
- Existing services
- Type of Plant used
- Any other information the CLIENT or the authorities reasonably need to grant approval.

Close liaison will be maintained throughout the construction with the relevant stakeholders, tenants, owners, etc. to avoid any inconvenience during the operations. It is noted that:

- Bridges may be required for Ditch crossings and Service Crossings dependent upon statutory bodies or Owner's approval.
- The majority of Service crossings will be trenchless, with only minor (Telecom Cables etc.) being Open Cut
- The majority of Road crossings will be trenchless, with only minor tracks being Open Cut
- The majority of the onshore cable route will be installed by Open Cut method.

### 8.8.2 MINOR DITCH CROSSINGS (OPEN CUT)

At minor ditches, the water course will be “flumed” which involves installing a steel pipe into the watercourse, plugging around the flume at both ends to form a watertight seal, to allow the water to continue to flow through the watercourse, whilst the cable trench is excavated below, maintaining a dry trench. This will not affect the watercourse during construction. The trench will then be excavated and the ducts installed to the trench using excavators. In some instances, it may be more practical to over pump the water.

Banks will be backfilled immediately after installation and the specified reinstatement requirements will be carried out as far as possible with the main reinstatement crews. All temporary works will be removed. Particular attention is given to reinstating the watercourse to its original shape to avoid changing flow characteristics.

All temporary works for excavations, supports, headwalls, thrust walls; access, egress, etc. will be designed in accordance with SDL Temporary Works group procedure.

## 8.9 HAUL ROAD INSTALLATION

Following topsoil stripping, pre-construction drainage activities, and any required cut and fill operations, the extents of the haul road will be marked out by the survey crew. The Haul Road crew will then carefully lay a geo textile membrane over the extents of the haul road footprint, in preparation for the delivery of the sub base stone, which will be delivered direct to site in 10T Tipper trucks direct from the supplier. Stone for the haul roads will be delivered direct to site for placement directly to the haul road where possible, in order to minimise double handling of material.

Where necessary, Haul Road stone may be delivered to mobilisation areas and stored temporarily, where it is not possible to deliver direct to the final point of use.

The haul road will be a minimum of 5m wide with a depth of 400mm which includes sub base and MOT Type 1 stone running course. Wider passing places will be installed to allow passing of plant and vehicles where deemed necessary.

Protection to existing underground services will be provided by means bogmat protection above, and quarantine hi-vis netlon fencing to limit crossing of the service to the temporary haul road.

Haul road construction will commence from the Main site yard at Saunton road, and work south through to the west side of the River Taw crossing.

The haul road in Section 3 (East side of the River Taw crossing) will commence form the Main site yard at Yelland substation, and work west to the HDD entry compound at the East side of the River Taw crossing.

### 8.10 DEWATERING

As ground conditions and water levels dictate, certain areas along the cable route may require point dewatering to ensure safe working conditions. Pipes will be sunk to a depth dictated by the ground conditions and water pumped out in advance of the works to temporarily lower the surrounding groundwater level. The groundwater produced will be pumped to an adjacent watercourse downstream of the works, as agreed with the landowner and SEPA. The outline pipes will be set up to prevent scouring and disturbance of the watercourse bed. The watercourse will be monitored for rate of flow and any sediment disturbance. Additional mitigation measures will be put in place if required. For the removal of water in the trench or localised ponding on the ROW, the Foremen will be notified of the land area agreed as suitable to pump the water on to. Should any further locations be required as the work continues, these will be directed through the lands Liaison Officer and agreed with the landowners and CLIENT.

Where possible, all pumped water will be distributed on to land away from watercourses and any newly installed header drains so that natural filtration can occur. Where water is pumped on to land, a filtrating bund will be constructed to prevent the build-up of silt over a large area. The silt collected will be returned to the subsoil surface post-pumping but prior to topsoil reinstatement.

Where surrounding land is not available for discharging water, then excess water will pass through a filtration system, for instance temporary settlement lagoons, with straw bales and silt netting filtration/silt bags and then into a watercourse.

After a schedule of crossing types has been ascertained, information will be transferred to tender issue stripmaps. These will include but not be limited to road, rail, service and river crossings, as well as plot identifications and adverse ground conditions and other relevant constraints. All will be labelled on the stripmaps with a crossing technique and length. Information from these stripmaps will be used for costing.

A water management scheme may also be installed which is formed from a number of lined lagoons with interconnecting spill ways in order to manage any ground water encountered during dewatering or run off. It will be necessary to have this water tested for contaminants prior to discharge into any adjacent watercourse, if a permit is obtainable from the relevant authorities.

### 8.11 TRENCH EXCAVATION AND BEDDING

The main trench excavation will be carried out by Hydraulic Back actors (or Trenchers as appropriate to the identified geology). The trench will be carefully excavated and the trench bottom will be graded such that the ducts are evenly supported throughout their length. Spoil from the trench will be stored away from the excavation, in the temporary spoil storage area. In areas where rock is encountered, it will be removed using excavators where possible, however it may be necessary to utilise peckers or a ripping tooth to enable excavators to access the rock strata. In cases where the rock is of sufficient strength and composition to make this method difficult, then a rock saw may be employed to cut a trench along the centreline to trench bottom depth. In areas of extremely high strength rock, it may be necessary to employ a chemical rock breaker, whereby holes are drilled into the rock and a chemical compound is injected which expands rapidly causing the rock to fracture. Where duct bedding is required, this will be taken into consideration during the trench excavation. Wherever possible we recommend the use of riddle buckets to provide suitable bedding material by “re-working” and selecting excavated material. Where land drains are encountered which must be reinstated, their position will be marked with wooded drain pegs on either side of the trench and referenced back onto the spread fence lines.

### 8.12 DUCT/CIVILS INSTALLATIONS

HDPE ducting as per the detailed design, and depending upon the trench configuration, will be laid to the floor of the trench, where it will be carefully laid on a minimum of 150mm thk bed of CBS (Cement bound sand). Ducting may be fabricated in the trench or topside of the trench, dependent upon run lengths and proximity to trenchless crossings. Excavators will be used to assist in the lowering and positioning of the final duct placement. Where the ducts require jointing, this work will be undertaken topside of the trench in order to avoid working in an unsupported trench where possible. The trench will be kept free of water during duct installation Checks will be made for duct damage once the duct is lifted and prior to being lowered into the trench and any defects will be repaired using an approved quick setting repair compound. Where short strings of 3-4 ducts are the chosen methodology, then excavators may lift the strings into the trench. When the duct is lowered off in the trench an Engineer will check that the required cover has been achieved Joint bays and link boxes will also be installed at this time.

### 8.13 BEDDING / PADDING / BACKFILL

Trench backfill will commence as soon as possible after the placement of the Ducts, and the As Built Survey is complete. Intimate backfill around the cable will be CBS (Cement bound sand) to a cover of 1.5m above the cable. Padding where necessary will either be imported sand or conditioned material recovered from the excavated spoil heap by means of riddle buckets or similar. In either event, suitable material will be carefully placed to the required level by the backfill crew. Care will always be taken to ensure that the specified surround and adequate compaction is achieved. After the initial backfill layer has been placed, the remainder of the excavated material will be placed in the trench in maximum 300mm layers and compacted with vibrating rollers. "Rammax" types are normally used. Wherever possible, we propose that the excavated material be utilised as backfill to avoid the environmental impact of importing large quantities of suitable padding material and to avoid the consequences of removing surplus. This has significant benefits including fewer vehicle movements along the spread and on public highways which has significant environmental and public relations benefits. Right of way preparation and maintenance issues are also significantly reduced. Where spoil cannot be reused, then any excess will be removed from site to a certified waste station for disposal.

## 8.14 DRAINAGE RECONNECTIONS

The reconnection of land drains cut by the cable trench, that are not being replaced by an easement or header drain will be carried out as part of the backfill operation. After the installation of the cable the backfill will be compacted in layers up to the underside of the severed drains which are to be permanently reinstated by cross connection. The replacement drain will extend into the virgin/undisturbed ground on each side of the trench width for a minimum of 1m measured at right angles to the trench. The undisturbed ground will be excavated by hand and a good connection formed to the existing drain. The cable trench backfill will then be compacted up to the subsoil surface level. All drainage reconnections across the trench will be carried out in accordance with the requirements of the land drainage specification.




## 8.15 CABLE INSTALATION AND TESTING

The Cable(s) are installed by winching them into the pre-installed ducts. The cable joint bay locations are nominated as either drum sites or winch sites, usually alternately along the route. The drum sites generally require better access than the winch sites due to the larger loads to be delivered to site. At the drum sites, cable drums are set up on powered drum stands that control the speed of installation and tension in the cable. The tension has to be carefully managed to avoid damage to the cables.

Depending on the length of the pull, a linear cable engine may be installed close the entrance to the duct, this equipment pushes the cable into the duct, helping to reduce the pulling tension. For extremely long or complex (lots of bends) cable sections, linear cable engines may be installed at intermediate locations to reduce the overall pulling tension. At the winch sites, suitable winches are set up. The winch wire is pulled through each duct in turn by a lightweight rope that is first “blown” through the duct using compressed air. The winch wire is pulled through and attached to a pulling eye that is installed on the end of the cable in the factory. The cables are lubricated as they enter the duct using a biodegradable lubricant.

Each cable pull (one duct in one section) is normally completed in a day. For the fibre optic cables, these are normally installed in separate smaller ducts by blowing only. Jointing of high voltage power cables is a significant task.

Each joint typically takes several days to complete, each joint bay may be actively being worked on for over a month. Cable jointing is sensitive to moisture and the atmosphere around the cables during the jointing operation must be carefully controlled for humidity. In order to achieve this a “jointing tent” is established over the joint bay and climate control equipment is installed. An alternative to a tent is a shipping container especially adapted with removable floor panels to fit over the joint bay and containing the climate control equipment along with the cable jointing apparatus.

The key steps are:

- cutting the two cables to be jointed to length
- stripping back the various layers of sheath, screen and insulation
- preparing the conductor for jointing and then jointing either by a compression ferrule or sometimes by welding
- assembling a pre-fabricated joint housing around the cables that is then filled with an insulating material such as silicone rubber.

## 8.16 LAND REINSTATEMENT AND POST CONSTRUCTION DRAINAGE

This operation is of paramount importance to the success of the Project and therefore is carried out and co-ordinated by experienced Supervisors, Foremen and highly skilled operators. The reinstatement operations comprise:

- Regrading subsoil including side slopes where applicable and removing surplus where necessary (Using Excavators / Dozers / Graders)
- Replacement Drainage Installation as instructed by the Drainage Design Engineering accordance with agreements with landowners and tenants or their agents

- Ripping the subsoil up to a suitable depth, specified in the Reinstatement Plan, in order to break up any panning using Flat Lift Rippers pulled by a Dozer or similar and taking care not to damage the field drainage
- Pulling the topsoil back from the fence line using excavators to allow Dozers to push it evenly back across the easement and leaving it generally level
- Prior to and after the Dozers, a crew reinstate ditch banks and replace the "Hedge mound" as far as possible using an excavator leaving only the running track, bridges and flume pipe
- The topsoil will then be given the "final trim" to leave it ready for reseeding by the landowner
- The permanent fencing is completed by a separate crew, using an excavator to drive fence posts into the ground

The machines used for the reinstatement of topsoil and subsoil will be of a suitable ground bearing pressure to avoid compaction. Areas of special concern will be addressed in specific Operational Procedures. SDL guiding philosophy will be to leave the land as they found it.

Where areas of specific specialist re-instatement is required, such as SSSI, Species rich grasslands, etc then these methods will be detailed the construction overview, and will be included in a separate Operational procedure or the Construction Environmental management plan.

### 8.17 HOUSEKEEPING

The easements, running track, and haul road will be maintained in good order throughout construction.

A Road brush will be employed to keep the roads clear of mud and tracked vehicles will cross carriageways over rubber tyres laid on the road, to minimise damage to the road surface. During dry periods, a water bowser will be utilised to damp down the surface of the right of way (ROW) in order to suppress dust generated by vehicle movements.

The easement will be kept clear of debris and construction waste by each crew and a separate clean up squad will go through following cable installation giving the spread a final clean up prior to backfill and topsoil reinstatement.

An emergency crew will be made available to carry out any emergency fencing or other repairs.

In the event of machinery such as pumps or compressors having to work 24 hours per day, special attention will be directed towards minimising noise disturbance affecting the local population. Approved measures such as earth bunds or bales of straw will be employed to screen off the working area.

Careful attention will be given to erecting adequate and proper signs where necessary. As a minimum these will comply with the requirements of the relevant legislation.

GREEN VOLT

# Appendix 5.2

## Outline CEMP

Onshore EIA Report: Volume 3

| Document Code: FLO-GRE-PLA-0007 | | |
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| **Prepared by:** | Andy Maclean | *Andy Maclean* |
| **Checked by:** | Rob Collin | *Rob Collin* |
| **Approved by Client:** | Tracey Clarkson-Donnelly | *Tracey Clarkson-Donnelly* |

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# Contents

# Acronyms

| Acronym | Description |
|---|---|
| CEMP | Construction Environmental Management Plan |
| CMS | Construction Method Statement |
| COSHH | Control of Substances Hazardous to Health |
| CPP | Construction Phase Plan |
| CTMP | Construction Traffic Management Plan |
| DMP | Dust Management Plan |
| DSEAR | Dangerous Substances Explosive Atmosphere Regulations |
| EERP | Emergency Environmental Management Plan |
| EIA | Environmental Impact Assessment |
| EMP | Environmental Management Plan |
| EMS | Environmental Management Systems |
| GWDTE | Groundwater Dependent Terrestrial Ecosystems |
| LPPP | Light Pollution Prevention Plan |
| NMP | Noise Management Plan |
| PMP | Peat Management Plan |
| PPP | Pollution Prevention Plan |
| SEPA | Scottish Environmental Protection Agency |
| WMP | Waste Management Plan |

# Glossary

| Term | Description |
|---|---|
| Applicant | Green Volt Offshore Windfarm Ltd. |
| Application Site Boundary | The extent of the area relating to the planning application. |
| Cable Route Corridor | The cable route corridor is the area within which the cable trench, haul road and all ancillary infrastructure will be. The working width of this corridor will be up to 80m in some locations will be required to allow access for excavating cable and drainage trenches, storage of topsoil and excavated soil, delivery of materials, transportation of personnel, and the presence of excavation and cable installation machinery and equipment |
| Development Plan | The Site is wholly within the Aberdeenshire Council area and therefore the Development Plan in this instance consists of the National Planning Framework 4 (NPF4) and the Aberdeenshire Local Development Plan 2023 (ALDP) (Aberdeenshire Council, 2023). |
| Landfall | The area where the subsea cables from the Green Volt Offshore Windfarm will make landfall. This area will contain the Trenchless Compound and any other ancillary infrastructure required. |
| Main Site Yard | The Main Site Yard is where staff will mobilise on workdays, and where they will park their personal transport before being transported to the work site. |
| Mean High Water Springs | At its highest and 'Neaps' or 'Neap tides' when the tidal range is at its lowest. The height of Mean High Water Springs (MHWS) is the average throughout the year, of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest (Spring tides). |
| Mobilisation Areas | The mobilisation areas will be used to offload plant and materials to allow access to the Cable Route Corridor. Will also be used for temporary storage of construction materials. |
| National Development | One of the 18 developments and classes of development that are considered nationally significant by National Planning Framework 4 |
| National Grid New Deer Substation | The existing national grid 400Kv substation located at New Deer. |
| Net Zero GHG | The balance is zero between the amount of greenhouse gas (GHG) that is produced and the amount that is removed from the atmosphere. |
| Offshore EIA Report | The EIA for the Green Volt Offshore Windfarm submitted to Marine Scotland in January 2023. |
| Offshore Export Cables | The cables which will bring electricity from the offshore substation platform to the Landfall or to the oil and gas platforms. |

| | |
|---|---|
| Offshore Project | Refers solely to the offshore element of the Project, which is being consented separately. This includes the Offshore windfarm and offshore export cable corridor. |
| Offshore Substation Platform | A fixed structure located within the Windfarm Site, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore. |
| Onshore Cables | The cables which will take power to and from the Proposed Substation south-west of New Deer and Green Volt Offshore windfarm. |
| Onshore EIA Report | The EIA Report for the Green Volt Onshore Infrastructure (Proposed Development). |
| Onshore Transition Jointing Pit | The interface between the offshore and onshore cable systems. |
| Project | Green Volt Offshore Windfarm project as a whole, including associated onshore and offshore infrastructure development. |
| Proposed Development | Green Volt Onshore Infrastructure development including; the Landfall, the Cable Route Corridor, and the Substation Compound. Including all ancillary infrastructure. |
| Proposed Substation | The new Proposed Substation at the grid connection point located approximately 5.5km from New Deer and 0.45km south-east of the existing National Grid New Deer Substation. |
| Site | The area within the Application Site Boundary within which the Proposed Development lies. |
| Substation Compound | Part of the Proposed Development consisting of substation (grid transformers and HVAC switchgear and associated electrical equipment), temporary construction compound, drainage, and the proposed route of the connection to the SSE/National Grid Substation. |
| Trenchless Compound | A trenchless mechanism for the installation underground utilities such as cables. |

# Outline Construction Environmental Management Plan

## 1.1 Introduction

### 1.1.1 Purpose of Outline CEMP

1. The purpose of this document is to support the information provided within the Environmental Impact Assessment (EIA) Report demonstrating the link between the EIA and the construction phase of the the Green Volt Onshore Infrastructure (Proposed Development). An outline Construction Enviornmental Management Plan (CEMP) sets out the controls and processes to be adopted to mitigate enviornmental impacts over the duration of a project. CEMPs are iterative documents that develop over the course of the construction of a project.
2. This Outline CEMP describes, at a high level, the minimum requirements for the CEMP and provides guidance on what the content should include. The CEMP is based on industry best practice and relevant legislations (at the time of preparation). This document is an appendix to the **Onshore EIA Report**.
3. This Outline CEMP sets out Green Volt Offshore Windfarm Ltd's (the Applicant's) minimum requirement for inclusions within a CEMP and sets out guidance and best practice to be adopted by the Principal Contractor. It is acknowledged that the Principal Contractor is likely to have their own management system requirements and these will drive the development of site specific documents such as the Construction Phase Plan (CPP) and the Construction Method Statement (CMS) which will take on board the processes highlighted in the CEMP. As a result, the final CEMP for the Proposed Development may vary from what is set out within this Outline CEMP. Site specific issues, requirements of any planning consent, along with updates in legal requirements and construction best practice will also need to be considered in the CEMP.

### 1.1.2 Typical Contents for a CEMP

4. The typical contents for an electricity infrastructure CEMP are set out below. Outline contents for the sections are detailed in **Sections 1.2 to 1.9.**

- Purpose
- Site Description and Associated Environmental Sensitivities
- Scope
- Site Responsibilities
- Associated Documentation
- Construction Method Statement
- Environmental Management Plan
- Monitoring

## 1.2 Site Description and Associated Environmental Sensitivities

5. This section of the CEMP will provide information or links to relevant details concerning environmental sensitivities on the site. The following aspects will be addressed:

6. Watercourses: Identify and describe any watercourses present on or near the site. This includes rivers, streams, lakes, or other bodies of water. Provide information on their location, flow direction, and any specific sensitivities or conservation designations associated with them.
7. Protected Habitats: Identify any protected habitats or environmentally sensitive areas within or adjacent to the site. This may include designated nature reserves, protected species habitats, wetlands, or other ecologically significant areas. Describe their boundaries, importance, and any constraints associated with these habitats.
8. Human Receptors: Identify nearby human receptors that could potentially be impacted by the project, such as residential areas, schools, hospitals, or other sensitive receptors. Describe their proximity to the site and any measures in place to mitigate potential impacts on these receptors.
9. Constraints: Highlight any constraints that may affect the project, such as legal or regulatory limitations, cultural heritage considerations, archaeological sites, or any other site-specific constraints that need to be taken into account.
10. Site Layout Plans: Include site layout plans that depict the project area and its surroundings. These plans should clearly indicate the location of watercourses, protected habitats, human receptors, and any other relevant environmental features.
11. Scope of Works: Provide a comprehensive description of the scope of works to be undertaken. This should include details of the construction activities, equipment usage, material storage areas, access routes, and any potential environmental interactions associated with the project.
12. Environmental Aspects, Impacts, Risks, and Opportunities: Identify and evaluate the environmental aspects and impacts associated with the project. Assess the risks involved and identify any potential opportunities for environmental improvement or sustainability. This may include considerations related to air quality, water quality, noise, waste management, energy consumption, or other relevant factors.
13. The purpose of this section is to provide a clear understanding of the environmental sensitivities on the site and how they relate to the project. By identifying these sensitivities and associated risks, the CEMP can incorporate appropriate measures to minimize environmental impacts, ensure compliance with regulations, and seize any potential opportunities for positive environmental outcomes.

## 1.3 Scope

14. This section of the CEMP will describe the key works associated with the Proposed Development. The Key works which this section will refer to are as follows.
15. The Key works associated with the Proposed Development are:

- Civil works
- Electrical works
- Drainage works
- Enabling works
- Commissioning works
- Reinstatement works

16. This section of the CEMP will also highlight the management and supervision structure associated with the Proposed Development.

### 1.3.1 Roles for Environmental Management

17. The Environmental Management responsibilities for the site must be documented to ensure effective environmental management throughout the project. This section of the CEMP will outline the environmental responsibilities on site, including the roles and responsibilities of key site staff members. It will also establish the connection between Green Volts' responsibilities and those of the project team, such as the site environmental manager, environmental advisor, and specialised professionals like Ecological Clerk of Works and Archaeologists.
18. The section should address interactions with various stakeholders, including but not limited to the Local Authority, NatureScot, Scottish Environment Protection Agency (SEPA). These interactions should be discussed

in terms of how the project team will engage with these stakeholders, collaborate on environmental matters, and comply with relevant regulations and guidelines.

19. Specifically, the section should cover:

20. Site Staff Responsibilities: Clearly define the environmental management responsibilities of key site staff members, including their roles in implementing and monitoring environmental practices, ensuring compliance with regulations, and promoting sustainability initiatives. This may include roles such as the site environmental manager, environmental advisor, and other relevant personnel.

21. Principle Contractor: Outline the overarching environmental responsibilities of the Principal Contractor. This should include their commitment to environmental protection, adherence to applicable laws and regulations, and any specific environmental goals or targets set by Green Volt.

22. Project Team Collaboration: Describe how the site's environmental management responsibilities and activities align with the overall project team's efforts. Highlight coordination and communication channels between site staff, Green Volts, and other project team members to ensure effective integration of environmental considerations into project planning and execution.

23. Environmental Specialists: Identify any specialized environmental roles or expertise required for the project, such as Ecological Clerk of Works and Archaeologists. Specify their responsibilities, qualifications, and involvement in environmental assessments, monitoring, and mitigation measures.

24. Stakeholder Interactions: Detail how the site will engage with relevant stakeholders, including local authorities and environmental agencies. Discuss the purpose of these interactions, such as obtaining necessary permits or approvals, sharing environmental monitoring data, or addressing concerns raised by stakeholders.

25. The documentation of Environmental Management responsibilities should provide a comprehensive overview of how the project will proactively address environmental considerations and collaborate with stakeholders to achieve sustainable and compliant project outcomes.

### 1.3.2 Key Contact Details

26. The CEMP will contain the key contact details for the project. Below provides an example of who the key contacts might be.

*Table 1.1 Key Project Contacts*

| Name | Role | Email: | Telephone |
|---|---|---|---|
| **Developer: Flotation Energy** | | | |
| | | | |
| | | | |
| **Green Cat Renewables** | | | |
| | | | |
| **Stockton Drilling** | | | |
| | | | |
| | | | |

### 1.3.3 Communication

27. At all times there will be good communication between all parties on the site and during both the design and construction works. The Principal Contractor will be responsible for all Contractors on the site and any issues/conflicts should be brought to their attention in the first instance.

28. The overall project programme is the responsibility of the Project Manager in consultation with the Principal Contractor and the Client. Any wider technical and programme issues will be managed by the Project Manager.

## 1.4 Site Responsibilities

29. The following section of the CEMP will detail key areas of responsibilities, roles, and protocol during work on site. The Principal Contractor will be primarily responsible for the following aspects of the Site:

- Control of Access / Egress
- Welfare Facilities and Construction Compound
- Materials
- Chemical Inventory
- Diesel
- Oil and Greases
- Site Toilets
- Other Chemicals
- Plant
- Mud/Bio Contamination
- Concrete Management

## 1.5 Associated Documentation

30. This section of the CEMP should reference the pertinent associated Environmental Management System (EMS) and site-specific documentation that needs to be considered when developing the Construction Environmental Management Plan (CEMP). Examples of such documentation may include:

31. Client Requirements: This includes any specific environmental policies or guidelines set by the client, such as the Green Volts Environmental Policy or other client-specific requirements related to environmental management.

32. Contractors EMS Requirements: If the contractor has its own EMS in place, reference should be made to any relevant requirements or procedures that need to be incorporated into the CEMP.

33. Site Environmental Statement: The site-specific Environmental Statement, if available, should be referenced for an understanding of the environmental considerations and requirements outlined for the project.

34. Planning Conditions and Consents: This refers to any conditions imposed by the local planning authority or regulatory bodies as part of the project's planning permission or consents. These conditions may contain specific environmental requirements that must be incorporated into the CEMP.

35. Risk Registers: Any existing risk registers or assessments that identify environmental risks and mitigation measures should be referenced. These could include risks related to pollution, habitat disturbance, or other environmental impacts.

36. Legal Registers: A legal register outlines the relevant environmental legislation, regulations, and permits applicable to the project. It is important to reference the legal register to ensure compliance with all relevant environmental laws and requirements.

37. The purpose of referring to these associated EMS and site-specific documents is to ensure that the CEMP aligns with established requirements, policies, and regulations. By incorporating the relevant provisions from these documents into the CEMP, the project can effectively address and manage environmental risks, comply with legal obligations, and meet client and regulatory expectations.

## 1.6 Construction Method Statement

38. This section of the CEMP will describe the construction methods and sequencing attributed to the Proposed Development and provide methods of mitigation against the associated risks. It should be borne in mind that construction methodology could vary slightly from that described depending on the Contractors' designs, resources, plant and land ownership and preferred method of working.

39. The appointed Contractors will be required to provide specific Risk Assessments and Method Statements for works for inclusion in the CMS All activities are to be carried out in accordance with the Construction (Health Safety and Welfare) Regulations 1996 and the Construction Design and Management Regulations 2015.

40. The Section will focus on the following aspects of the Proposed Development

- Site Investigation
- Drainage Trenches
- Haul Road Construction
- Minor Ditch Crossings
- Major Crossings
- Cable trenches
- Substation
- Post Construction Restoration and Reinstatement

## 1.7 Environmental Management

41. Sustainable Development should be an integrated consideration throughout the construction stage. By incorporating sustainable practices, benefits can be realised not only from an environmental perspective but also from economic and social aspects. This section of the CEMP will outline the controls and processes to be adopted to mitigate environmental impacts on site. Such controls and processes are as follows:

- Wastewater and water supply monitoring and control
- Surface Water Management
- Oil and Chemical delivery and storage
- Waste and Resource Management including Circular Economy
- Air, Noise and Vibration, Land Management – including flora and fauna
- Traffic and Transport
- Environmental Incident Response
- Method Statements and Risk Assessment

42. It should be noted that this list is not exhaustive and has the potential to be developed further.

### 1.7.1 Wastewater and water supply monitoring and control

43. Wastewater poses a significant environmental hazard, as it can lead to contamination of groundwater and pollution of surface waters. To effectively manage wastewater and water supply facilities at construction sites, it is crucial to implement a set of monitoring and maintenance control measures. These measures are essential for ensuring the proper handling and treatment of wastewater to minimise negative impacts on the environment. The following information and guidance should be implemented in accordance with the Proposed Development.

#### 1.7.1.1 Wastewater Monitoring Control

44. Wastewater facilities commonly found on construction sites include septic tanks, cesspits, or holding tanks. These facilities require regular emptying by a licensed waste carrier. The responsibility for determining the frequency of emptying and associated tasks lies with the Principal Contractor. The emptying frequency depends on the capacity of the tank and the number of personnel present on the site.

45. The Principal Contractor is responsible for sampling, screening, and recording the results to ensure compliance with relevant consent or authorisation conditions. As part of environmental site inspections, the Principal Contractor should periodically visually inspect the quality of discharge from septic tank facilities.

46. Concrete washout areas should be properly planned to prevent congestion with site traffic and designed to prevent runoff into the natural environment. It is recommended to use a lined containment system to capture the washout water. Once the washout areas are full and the concrete has hardened, it should be broken out and disposed of appropriately. Clear identification of designated washout areas at specified locations is necessary.

47. Overall, it is essential to follow these guidelines to manage wastewater facilities effectively and ensure compliance with environmental regulations on construction sites.

#### 1.7.1.2 Water Supply

48. Construction sites often lack a direct connection to a mains water supply. Drinking water is typically provided through drinking water coolers, while toilet and kitchen facilities rely on alternative water sources. One common method is rainwater harvesting, where water is collected and stored in holding tanks on the roof of the construction compound. Another option is using tankered water deliveries.

49. In some cases, construction compounds may also receive water from an abstraction point, such as a borehole water supply. Water abstraction may be necessary for other on-site activities, such as operating concrete batching plants. It is the responsibility of the Principal Contractor to monitor and record the location of abstraction activities on-site, as well as the associated abstraction rates, during the construction phase. These records are essential for demonstrating compliance with any abstraction licenses or permits that may be required.

50. By effectively managing water sources and monitoring abstraction activities, construction sites can ensure they comply with regulations and maintain a sustainable water supply throughout the project.

### 1.7.2 Surface Water Management

- Determining the most suitable system for managing surface water at a construction site depends on various factors. These factors include the volume of rainfall on-site, the site's gradient, soil type, and the available land area. The Principal Contractor, responsible for the construction project, will assess these factors and decide which surface water management measures are most appropriate for the site. Agreed upon drainage systems will be designed by suitably qualified personnel. Here are some of the techniques commonly available:
- Cut-off ditches can be strategically constructed upslope of excavations, roads, infrastructure elements, or other work areas at a construction site. Their purpose is to collect clean runoff before it reaches the disturbed ground and divert it around or away from the work site. This collected flow of uncontaminated water, known as greenfield flow, can then be discharged over a suitable dispersion area with undisturbed vegetation, for example. This helps maintain the integrity of the surrounding environment.
- Drainage ditches, on the other hand, are designed to capture surface water runoff from roads or other infrastructure elements on-site. They serve to redirect the runoff to an appropriate discharge point using surface water control and mitigation measures. These measures aim to reduce the amount of silt within the runoff, minimising the impact of the discharge into nearby watercourses.
- Splash backs are protective structures that can be installed at road crossings over watercourses and ditches on construction sites. They help prevent the direct entry of water and sediment runoff from roads into the watercourses. One commonly used measure for this purpose is the installation of silt fences. Silt fences act as barriers to trap sediment and prevent it from flowing into surface watercourses. They are typically placed along the edges of roads or other areas where sediment-laden runoff is likely to occur. Silt fences require regular inspection and maintenance to ensure their effectiveness in preventing silty runoff from entering the watercourses below.

### 1.7.3 Oil and Chemical Delivery

51. To ensure responsible handling and storage of oils and chemicals on a construction site, the following practices should be included within the CEMP:

- Manageable Quantities: Oils and chemicals should only be ordered in quantities that can be effectively managed and used within a reasonable timeframe. This helps prevent excess stock and potential hazards associated with long-term storage.

- Responsible Storage: Oils and chemicals should be stored in designated areas such as bunded areas or suitable containers/storage areas. These areas should comply with relevant legislation and regulations regarding storage and containment. Adequate measures should be in place to prevent leaks, spills, and unauthorised access.
- Proper Labelling: Containers used for storing oils and chemicals must be clearly labelled with accurate details of their contents. This ensures easy identification and helps prevent mix-ups or accidental use of the wrong substances.
- Controlled Deliveries: All deliveries of oils and chemicals should be received by a competent staff member who will direct the driver to the appropriate delivery point. This ensures proper handling and reduces the risk of spills or mishaps during delivery.
- Spillage Kits: Spillage kits containing appropriate absorbents and materials should be readily available at or near the delivery point. These kits are essential for addressing emergencies and containing spills promptly.
- Escort Requirement: Depending on the site's specific requirements and safety protocols, there may be a need to escort delivery vehicles, especially for fuel deliveries, onto and through the site. This helps ensure safe navigation and prevents accidents or unauthorised access.
- The Site should maintain a Control of Substances Hazardous to Health (COSHH) inventory.

52. By adhering to these practices, construction sites can minimise the risks associated with the handling, storage, and delivery of oils and chemicals, promoting a safer working environment, and reducing the potential for environmental contamination.

#### 1.7.3.1 COSHH

53. Substances that are deemed to be hazardous to health, listed under the COSHH Regulations are accompanied with a hazardous information sheet. The Contractor is responsible for carrying out a risk assessment of each hazardous substance. All COSHH substances must be stored and disposed of in accordance with COSHH regulations, with all necessary precautions being taken. All hazardous materials shall be stored in suitable bunded and vented security cage/container prior to use. Used containers shall be controlled and disposed of safely as set down in the relevant COSHH assessments and with reference to the current Dangerous Substances Explosive Atmosphere Regulations (DSEAR).

54. The Principal Contractor will take all practical steps to make sure that all waste from the site is handled with in accordance with the requirements under The Waste (Scotland) Regulations 2012.

### 1.7.4 Waste and Resource Management

55. The CEMP should include the following information about Waste and Resource Management.

- Storage of waste: Waste should be deposited and contained within designated storage facilities. These facilities should be appropriate for the type of waste being stored and labelled accordingly. Different waste streams should be separated to facilitate recycling. For example, paper, cans, plastics, wood, metal, and packaging should be segregated as appropriate.
- Labelling and Durability: Containers used for waste storage must be labelled with clear and durable labels. This ensures proper identification of the waste contents and helps prevent mix-ups or confusion. Labels should remain intact and readable throughout the storage period.

### 1.7.5 Noise

56. During the construction process, there is a potential for noise and vibrations to be generated, which can have impacts on the surrounding environment and nearby receptors. The CEMP will include measures used to mitigate these effects. Such measures need to be implemented on-site to minimise noise and vibration disturbances. Additionally, a program of monitoring may be necessary to ensure compliance with regulatory requirements and to assess the effectiveness of mitigation measures.

### 1.7.6 Monitoring / Ongoing Review

57. It will be the responsibility of the Principal Contractor and ECoW to carry out monitoring and review duties.

## 1.8 Environmental Management Plan

58. The CEMP will include an Environmental Management Plan (EMP). The following individual management plans and site controls will be encompassed within the EMP as required:

- Ecological Clerk of Works (ECoW)
- Waste Management Plan (WMP)
- Noise Management Plan (NMP)
- Pollution Prevention Plan (PPP)
- Emergency Environmental Response Procedure (EERP)
- Dust Management Plan (DMP)
- Peat Management Plan (PMP)
- Construction Traffic Management Plan (CTMP)

### 1.8.1 Ecology Clerk of Works

59. As part of the environmental monitoring efforts, the monitoring of flora and fauna should be carried out during daily or weekly site inspections conducted by the on-site Ecological Clerk of Works (ECoW), environmental advisor/manager, or other designated personnel. These inspections aim to assess the impacts of construction activities on local biodiversity and protected species.

60. The ECoW has been appointed to oversee the construction of the development and ensure the above mitigation is implemented. More specifically, the ECoW is to:

- Ensure correct implementation the Environmental Management Plan (EMP) on site;
- Stop operations to alter construction methods should there be any works occurring which are having an adverse impact on the natural heritage;
- Provide an environmental/ecological toolbox talk for construction staff prior to the commencement of development;
- Monitor watercourses and drainage features on and around the site for evidence of sediment and or other pollution;
- Amend working practices should it be required in the interests of Ecology;
- Relay any amendments to working practices to the Council, as an addendum to the approved EMP;
- Make weekly visits to the development site at a time of their choosing;

### 1.8.2 Ground Water Dependant Terrestrial Ecosystems

61. The Site Engineer in conjunction with the ECoW will identify any Ground Water Dependant Terrestrial Ecosystems (GWDTE) habitats on site and arrange for mitigation measures to be implemented where the GWDTE cannot be avoided by construction works as they are sensitive to changes in ground-water hydrology. All GWDTE habitats should be clearly identified on the ground and, if not obvious, should be clearly marked with high visibility tape.

62. It is acknowledged that it will be impossible to avoid all areas of GWDTE's. The ECoW will advise on the best methods to retain the hydrology of these areas.

63. During construction, impacts due to vehicular access across unprotected ground will be minimised by:

- The use of vehicles designed to spread their load to a low Kg/m2, e.g. wide spread track excavators.
- Wherever possible vehicles will be routed to avoid flushes, pockets of blanket bog, streams, and soak aways.
- Culverts used will be made of a neutral pH material such as plastic, and large enough to carry heavy flow. Care will be taken to avoid disturbing the soil around the streams enabling the groundwater to seep naturally through the peat and other soils.
- The number of journeys made across unprotected ground will be minimised.
- All staff will be advised as to where important habitats are and provided with alternative routes to avoid crossing them.
- Where necessary floating tracks will be used to traverse mire habitats allowing water to pass underneath the track.

### 1.8.3 Protected Species

64. The CEMP will include a habitat management plan, species protection plans and detail standard working methods and good practice measures, such pollution prevention measures.

65. Habitat management plans are advised to protect and enhance good quality habitat and effective hydrological connectivity to sensitive mire and swamp habitats and watercourses.

### 1.8.4 Noise Management Plan

66. The Noise Management Plan will be used to implement the following mitigation measures:

- Noise and Vibration Assessment: Conduct a comprehensive noise and vibration assessment to identify potential sources and evaluate their potential impacts. This assessment should consider the sensitivity of nearby receptors, such as residential areas, schools, or hospitals.
- Mitigation Measures: Implement appropriate mitigation measures to minimise noise and vibration effects. This may include selecting quieter construction methods and equipment, using noise barriers or enclosures, employing vibration-damping techniques, or establishing exclusion zones to limit impacts on sensitive receptors.
- Construction Schedule and Working Hours: Plan the construction activities and working hours to minimise potential disruptions to the surrounding area. This could involve scheduling noisy activities during permissible hours and avoiding sensitive periods, such as nighttime or weekends, when possible.
- Equipment Maintenance: Regularly maintain and service construction equipment to ensure optimal performance and reduce noise and vibration emissions.
- Communication with Stakeholders: Establish effective communication channels with nearby stakeholders, such as residents or businesses, to keep them informed about the construction activities, potential noise and vibration impacts, and mitigation measures in place. Encourage feedback and address any concerns promptly.
- Monitoring and Compliance: Develop a program of monitoring to assess the effectiveness of noise and vibration mitigation measures and ensure compliance with regulatory limits. This may involve conducting regular noise and vibration measurements at designated monitoring points and adjusting mitigation measures as needed.

### 1.8.5 Pollution Prevention Plan

67. The objectives of the Pollution Prevention Plan (PPP) are to ensure that measures are in place for all construction activities of the Proposed Development. The key objectives of the PPP are to:

- Identify all pollutant sources and sensitive receptors.
- Identify, construct and implement any special procedures or control measures to protect the environment.
- Implement a management plan to include waste management and incident response.
- Continually monitor and review the environmental impact of the work and continually update the management plan as necessary.

68. The Principal Contractor's Site Manager will have specific responsibility for implementation of the PPP, continuously monitoring throughout the construction process. In the event of any pollution incident, SEPA and all other relevant stakeholders are to be contacted.

#### 1.8.5.1 Light Pollution Prevention Plan (LPPP)

69. The LPPP will be included as part of the PPP. It is anticipated that the vast majority of works for the Proposed Development will be undertaken during daylight hours however there may be circumstances for matters of safety which will require the illumination of areas of work by artificial means. For example, during substation construction which is a weather dependant operation and therefore may need to be undertaken out with daylight hours. Should artificial lighting be required, lamps will be positioned such that there will be no direct illumination of any neighbouring properties.

### 1.8.6 Emergency Environmental Response Procedure

70. Responsible construction and effective management of health, safety, and environmental risks are crucial in preventing environmental incidents. As part of the Construction Environmental Management Plan (CEMP), it is essential to develop an Emergency Environmental Response Procedure (EERP) to effectively address any unforeseen environmental incidents that may occur during the construction process. This procedure should include a response flow chart to guide the appropriate actions in the event of an incident.

71. The Emergency Environmental Response Procedure (EERP) should encompass the following elements:

- Incident Identification: Clearly define the criteria for identifying an environmental incident. This could include spills, leaks, uncontrolled releases of hazardous materials, damage to protected habitats, or any other situation that may pose an environmental risk.
- Reporting and Communication: Establish clear protocols for reporting and communicating environmental incidents. Identify the individuals or roles responsible for reporting incidents, both within the project team and to relevant external stakeholders, such as regulatory agencies or environmental authorities.
- Initial Response Actions: Outline the immediate response actions to be taken upon identification of an environmental incident. This may include stopping work in the affected area, isolating the incident site, containing spills or releases, and implementing emergency measures to prevent further harm or spread of contaminants.
- Roles and Responsibilities: Clearly define the roles and responsibilities of individuals involved in the environmental incident response. This includes the site environmental manager, project manager, relevant contractors, and any other key personnel. Assign specific responsibilities for incident assessment, containment, cleanup, and reporting.
- Flowchart: Develop a response flow chart that provides a visual representation of the steps to be followed in the event of an environmental incident. The flow chart should outline the sequential actions and decision points, guiding the response process and ensuring a consistent and coordinated approach.
- Training and Awareness: Ensure that personnel involved in the project are trained and aware of the Emergency Environmental Response Procedure. Conduct regular drills and exercises to test the effectiveness of the procedure and familiarise the team with their roles and responsibilities during an environmental incident.

72. The Emergency Environmental Response Procedure (EERP) and associated response flow chart are vital components of the CEMP. By having a well-defined and practiced procedure in place, the project team can effectively respond to environmental incidents, minimise potential impacts, and demonstrate a commitment to responsible environmental management throughout the construction process.

#### 1.8.6.1 Chemical Spillage (EERP)

73. In the event of a spillage incident, the EERP should detail the following methodology to rectify the situation:

- Stop the spill problem;
- Notify Site Management;
- Contain the immediate spill if necessary (may involve the use of sand bags, temporary dykes etc);
- Clean up using spill kit, placing contaminated material in double bags for removal from site as hazardous waste;
- Treat so that the affected area is rendered safe using appropriate chemicals (dilute it back to safe condition); and
- Review situation advise SEPA and revise site practices as required. Further actions could include notifying residents of chemical spills, supplying drinking water to residents and notifying North Lanarkshire Council Environmental Health. These further actions would be carried out only if required by SEPA.

74. Information on Spill Kits and the specialist spill repose contractor should be detailed within the EERP.

### 1.8.7 Dust Management Plan

75. Dust may be generated by construction activities during periods of dry weather. Good practice measures will be adopted on site to control the generation and dispersion of dust such that significant impacts on neighbouring habitats are minimised. The hierarchy for mitigation will be included within the Dust Management Plan (DMP):

- Prevention;
- Suppression;
- Containment.

76. All parties on site have a duty to ensure that neighbours and passers-by are not inconvenienced by dust resulting from site activities. The Principal Contractor should be informed immediately if it is considered that conditions or work practices could give rise to dust-blow outside the site boundary.

77. The following sections relating to dust management and monitoring during the construction works will be included within the DMP.

- Excavation and Earthworks;
- Stockpiling of Loose Materials;
- Vehicle Movement.

78. Monitoring of the need for and effectiveness of dust suppression shall be responsibility of all staff on site. Regular formal inspections shall be undertaken during periods of dry weather by site staff to supplement the informal monitoring and reporting by all staff.

### 1.8.8 Light Pollution Prevention Plan

79. It is anticipated that the vast majority of works for the Proposed Development will be undertaken during daylight hours however there may be circumstances for matters of safety which will require the illumination of areas of work by artificial means. For example, during substation construction which is a weather dependant operation and therefore may need to be undertaken out with daylight hours. Should artificial lighting be required, lamps will be positioned such that there will be no direct illumination of any neighbouring properties.

### 1.8.9 Peat Management Plan

80. Where there is peat found on construction sites in locations where excavations are planned, it is the responsibility of the Principal Contractor to ensure that guidance provided in the site-specific Peat Management Plan is followed. This plan should consider relevant guidance, best practices, and meet the requirements set by the regulatory authorities. Additionally, if forestry clearance is necessary as part of the development, a Forestry Residue Management Plan will also be required.

81. The Peat Management Plan should address the following aspects:

- Regulatory Compliance: Ensure that the plan complies with the requirements and regulations set by the appropriate regulatory bodies overseeing peat excavation activities. This may include obtaining necessary permits or consents and adhering to specific guidelines or environmental standards.
- Guidance and Good Practice: Incorporate appropriate guidance and good practices related to peat excavation. This could include guidelines provided by relevant environmental agencies, industry best practices, and any specific measures required to protect peatland habitats.
- Peatland Conservation: Outline measures to minimise impacts on peatland habitats and promote conservation. This may involve avoiding or minimising peat excavation where feasible, implementing measures to prevent erosion and habitat degradation, and considering habitat restoration or rehabilitation efforts.
- Environmental Monitoring: Define a program for environmental monitoring during peat excavation activities. This may include monitoring water quality, assessing impacts on flora and fauna, and monitoring changes in peatland hydrology or carbon storage.
- Mitigation Measures: Identify and describe mitigation measures to minimise adverse impacts associated with peat excavation. This could include measures to control sediment runoff, manage water levels, stabilise excavated areas, and restore or rehabilitate disturbed peatland areas.

### 1.8.10 Construction Traffic Management Plan

82. During the construction phase, various traffic movements will occur within the site boundary as well as on the local road network. These movements may involve heavy goods vehicles, turbine deliveries, and other construction-related traffic. To address the associated impacts of these traffic movements, the Construction

Environmental Management Plan (CEMP) should include measures to manage and mitigate these impacts. This may involve the development of a Traffic Management Plan.

83. The Traffic Management Plan within the CEMP should address the following considerations:

- Traffic Impact Assessment: Conduct a comprehensive assessment of the potential traffic impacts associated with the construction activities. This assessment should consider factors such as the volume of traffic, vehicle types, peak periods, and the capacity of the local road network to handle the increased traffic.
- Traffic Routing: Define appropriate traffic routes within the site boundary and on the local road network to minimise disruption to nearby communities and ensure efficient traffic flow. This may involve designated access points, specific routes for different types of vehicles, and coordination with local authorities and transportation agencies.
- Traffic Calming and Speed Management: Implement measures to manage vehicle speeds and promote road safety. This may include the installation of speed bumps, traffic signs, speed limits, and other traffic calming measures within the site and along access routes.
- Vehicle Management and Emissions: Encourage the use of low-emission vehicles and promote responsible vehicle management practices, such as regular maintenance and adherence to emission standards. This helps minimise air pollution and reduce the environmental impacts associated with vehicle emissions.
- Delivery Scheduling: Coordinate and schedule deliveries, especially for turbine components or other large equipment, to minimise congestion and potential disruptions on local roads. Considerations should be given to off-peak delivery times and coordination with local authorities and transport providers.
- Communication and Engagement: Establish effective communication channels with local communities, residents, and stakeholders to inform them about construction-related traffic movements. Provide timely updates, address concerns, and ensure that the traffic management plan is communicated to all relevant parties.

## 1.9 Monitoring

84. A program of monitoring is an essential component of the Construction Environmental Management Plan (CEMP) to assess the effectiveness of environmental management measures and ensure compliance with regulatory requirements. The CEMP should document the monitoring program, which may include the following items, as relevant to the project:

- Surveys
- Site Inspections
- Environmental Audits
- Physical Monitoring

GREEN VOLT

# Appendix 5.3

## EMF Assessment

Onshore EIA Report: Volume 3

# Green Volt Project EMF assessment

| Document Control | | | |
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## Contents

## Abbreviations

| | |
|---|---|
| **AC** | Alternating Current |
| **DC** | Direct Current |
| **EIA** | Environmental Impact Assessment |
| **ELF** | Extremely Low Frequency |
| **EMF** | Electric and Magnetic Field |
| **Hz** | Hertz |
| **HPA** | Health Protection Agency |
| **HVAC** | High Voltage Alternating Current |
| **HVDC** | High Voltage Direct Current |
| **IARC** | International Agency for Research on Cancer |
| **ICNIRP** | International Commission on Non-Ionizing Radiation Protection |
| **IPC** | Infrastructure Planning Committee |
| **kV/m** | KiloVolt per meter |
| **NPS** | National Policy Statement |
| **NRPB** | National Radiological Protection Board |
| **PHE** | Public Health England |
| **WHO** | World Health Organisation |
| **µT** | Microtesla |

# 1. Introduction

## 1.1. Project description

1.1.1. This document provides an assessment of electric and magnetic fields (EMFs) associated with the proposed Green Volt project. Green Volt will use a grid-connected offshore windfarm to provide 100% of the power required by one of the largest oil and gas platforms in the North Sea as well as providing power to the UK grid.

1.1.2. Green Volt is at a development stage, where a range of electrical connection designs are being considered. There are two connection routes, one from the windfarm to the oil field, and one from the windfarm which transitions onshore and connects to the existing transmission system, described below:

- Ettrick and Blackbird, former oil-field sites to the Peterhead area: two offshore circuits approximately 120km in length transitioning to one circuit onshore connecting to the existing electricity transmission system.
- Ettrick and Blackbird former oil-field Field to the Buzzard oil platform: two circuits approximately 33km in length.

1.1.3. Green Volt will be developed as High Voltage Alternating Current (HVAC) cable circuits operating at 50 hertz (Hz). Each offshore circuit will consist of a single 3-core cable, but when the circuit comes onshore, three single-phase cables will be used per circuit.

1.1.4. Due to the geographical location of the connections, the offshore cable circuits are likely to be installed in close proximity to the North Connect high voltage direct current (HVDC) interconnector between Scotland and Norway. This assessment includes consideration of the cumulative impact of both projects.

1.1.5. This report will assess the EMF from the project and any mitigation to be considered.

## 1.2. Electric and Magnetic Fields

1.2.1. Electric and magnetic fields and the electromagnetic forces they represent are an essential part of the physical world. Their sources are the charged fundamental particles of matter (principally electrons and protons). EMFs occur naturally within the body in association with nerve and muscle activity, allowing these functions to happen. Humans also experience the natural static magnetic field of the Earth (to which a magnetic compass responds) and natural static electric fields in the atmosphere.

1.2.2. Electric and magnetic fields occur in the natural world, and people have been exposed to them for the whole of human evolution. The advent of modern technology and the wider use of electricity and electrical devices have inevitably introduced changes to the naturally occurring EMF patterns. Energised high-voltage power-transmission equipment, along with all other uses of electricity, is a source of EMFs.

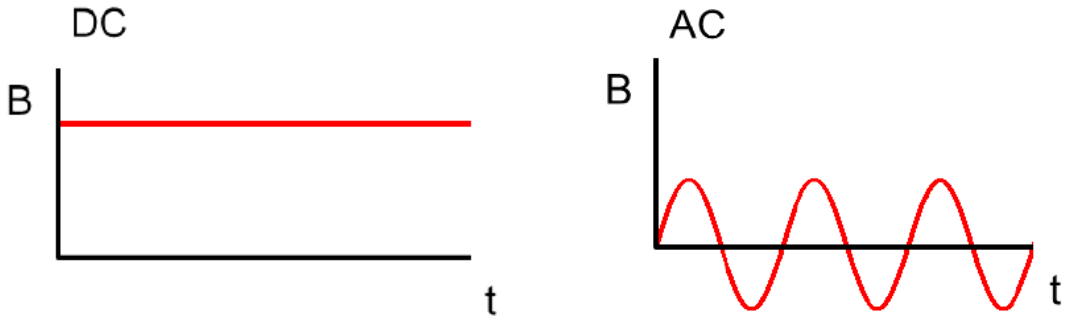
1.2.3. These EMFs have the same frequency as the voltages and currents that produce them. Power cables can be either alternating current or direct current. This project is proposing to install HVAC onshore and offshore connections, with a primary frequency of 50 Hz and these fields are described as power-frequency or extremely-low-frequency (ELF) alternating EMFs. There are areas where the proposed connections could be in close proximity to High Voltage Direct Current (HVDC) circuits which operate at a frequency of zero hertz (0 Hz).

1.2.4. A key characteristic of EMFs is their frequency. They always have the same frequency as the electricity that produced them. Most electricity supply in the UK is alternating current (AC) with a frequency of 50 cycles per second or 50 Hz. So, the EMFs it produces also alternate with a frequency of 50 Hz. However, there are an increasing number of electrical connections using direct current (DC) technology, so they will produce steady EMFs that always point in the same direction. (A different set of EMFs again are produced by radiofrequency electricity such as TV, radio and mobile communications – these have frequencies of typically hundreds of millions of Hz.)

1.2.5. The current in HVAC cables will periodically reverse direction with a frequency of 50 Hz (Fig. 1.2). The Earth has no natural AC fields, only those that result from man-made sources, such as those proposed here.

1.2.6. The current from HVDC cables flows in the same constant direction (Fig. 1.2). This will add to the Earth's natural magnetic field, meaning magnetic fields from DC cables have the potential to interfere with magnetic compasses.

**Figure 1.2: Direction of AC and DC magnetic fields:** Current from DC cables will flow in the same constant direction. Current in AC cables will periodically reverse direction with a frequency of 50 Hz.




## Magnetic fields

1.2.7. Magnetic fields are measured in microtesla (μT) and depend on the electrical currents flowing, which vary according to the electrical power requirements at any given time. They are not significantly shielded by most common building materials or trees but do diminish rapidly with distance from the source.

## Electric fields

1.2.8. Electric fields depend on the operating voltage of the equipment producing them and are measured in volts per metre (V/m). The operating voltage of most equipment is a relatively constant value. Electric fields are shielded by most common building materials, trees, and fences, and diminish rapidly with distance from the source.

1.2.9. As a consequence of their design, some types of equipment do not produce an external electric field. Neither the offshore nor the onshore cables proposed here will emit electric fields, because the metal sheath surrounding the cable ensures the electric field is confined within the cable.

1.2.10. The Earth's magnetic field can induce an electric field in moving sea water. The movement of the sea through the magnetic field will result in a small localised electric field being produced. AC magnetic fields will similarly induce an electric field within a marine organism moving through the field, which is an important consideration for biological impacts[1].

[1] Normandeau, Exponent, T. Tricas, and A. Gill. 2011. Effects of EMFs from Undersea Power Cables on Elasmobranchs and other Marines Species. U.S.Dept. of the Interior, Bureau of Ocean Energy Management, Regulation and Enforcement, Pacific OCS Region, Camarillo, CA. OCS Study BOEMRE 2011-09.

# 2. Legislation and Policy

## 2.1. Policy Framework for the Protection of People

2.1.1. At high enough levels, EMFs can cause biological effects, which depending on the frequency of the fields can impact nerve function or blood flow. Whilst there are no statutory regulations in the UK that limit the exposure of people to power-frequency EMFs, responsibility for implementing appropriate measures for the protection of the public lies with the UK Government, which has a clear policy, restated in October 2009 and incorporated in NPS EN-5[2], on the exposure limits and other policies they expect to see applied. Practical details of how the policy is to be implemented are contained in Codes of Practice[3] agreed between industry and the Government.

2.1.2. In the absence of any specific Scottish Government guidelines, those set by the UK Government remain applicable for the Green Volt Project. UK Government policy on EMF requirements for all electricity infrastructure projects is given in NPS EN-5[2].

2.1.3. The key provision is in section 2.10.9:

> *"…Government has developed with the electricity industry a Code of Practice, "Power Lines: Demonstrating compliance with EMF public exposure guidelines – a voluntary Code of Practice" published in February 2011 that specifies the evidence acceptable to show compliance with ICNIRP (1998) in terms of the EU Recommendation. Before granting consent to an overhead line application, the IPC should satisfy itself that the proposal is in accordance with the guidelines, considering the evidence provided by the applicant and any other relevant evidence."*

## 2.2. Exposure Limits

2.2.1. In March 2004, the NRPB provided new advice to the Government, replacing previous advice from 1993, and recommending the adoption in the UK of guidelines published in 1998 by the ICNIRP[4] The Government subsequently adopted this recommendation, saying that limits for public exposures should be applied in the terms of the 1999 EU Recommendation[5]. Table 2.1 summarises the recommended values.

**Table 2.1 Recommended Values for Power Frequencies**

| Public Exposure Levels | Electric fields | Magnetic fields |
|---|---|---|
| | **AC** | |
| Basic restriction (induced current density in central nervous system) | **2 mA/m²** | |
| Reference level (external unperturbed field) | **5,000 V/m** | **100 µT** |
| Field corresponding to the basic restriction | **9,000 V/m** | **360 µT** |

2.2.2. In recommending these levels, the NRPB considered the evidence for all suggested effects of EMFs. It concluded that the evidence for effects on the nervous system of currents induced by the fields was sufficient to justify setting exposure limits, and this is the basis of their quantitative

[2] Department of Energy and Climate Change. National Policy Statement for Electricity Network Infrastructure (EN-5). London: The Stationary Office, 2011.

[3] Department of Energy and Climate Change. Power Lines: Demonstrating compliance with EMF public exposure guidelines. A voluntary Code of Practice. London, 2012.

[4] International Commission on Non-Ionizing Radiation Protection. Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields. Health Physics, 1998, 74 (4), p.494

[5] European Union Council. Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) (1999/519/EC). Brussels, 1999.

recommendations[6]. It concluded that the evidence for effects at lower fields, for example the evidence relating to childhood leukaemia (discussed further below), was not sufficient to justify setting exposure limits, but was sufficient to justify recommending that the Government consider possible precautionary actions. Precautionary measures are considered in more detail below.

2.2.3. The EMF limits are documented in NPS EN-5[2] and practical details of their application are explained in the Code of Practice, 'Power Lines: Demonstrating compliance with EMF public exposure guidelines – a voluntary Code of Practice'[3] published by the then Department of Energy and Climate Change (DECC). It is the electricity industry's policy to comply with the Government limits on EMF, and this Code of Practice forms an integral part of this policy.

2.2.4. The ICNIRP guidelines[4] are set so as to prevent external exposure to EMFs that could cause currents to be induced in the body large enough to cause effects on nerves, with a substantial safety margin. These induced currents can be expressed as a current density, and it is on current density that the guidelines are based. The ICNIRP guidelines recommend that the general public are not exposed to levels of EMFs able to cause a current density of more than 2 milliAmps per metre squared ($mA/m^2$) within the human central nervous system, as shown in Table 2.1 above. This recommendation is described as the "basic restriction". The external fields that have to be applied to the body to cause this current density, have to be calculated by numerical dosimetry, since in-vivo measurements of current density are not practical.

2.2.5. The ICNIRP guidelines also contain values of the external fields called "reference levels". For the public, the reference level for electric fields is 5 kV/m, and the reference level for magnetic fields is 100 µT. The 1999 EU Recommendation[5] uses the same values as ICNIRP[4].

2.2.6. In the ICNIRP guidelines and the EU Recommendation, the actual limit is the basic restriction. The reference levels are not limits but are guides to when detailed investigation of compliance with the actual limit, the basic restriction, is required. If the reference level is not exceeded, the basic restriction cannot be exceeded, and no further investigation is needed. If the reference level is exceeded, the basic restriction may or may not be exceeded.

2.2.7. The Code of Practice on compliance[3] endorses this approach and gives the values of field corresponding to the basic restriction, stating:

*"The 1998 ICNIRP exposure guidelines specify a basic restriction for the public which is that the induced current density in the central nervous system should not exceed 2mA $m^{-2}$. The Health Protection Agency specify that this induced current density equates to uniform unperturbed fields of 360µT for magnetic fields and 9.0kV m-1 for electric fields. Where the field is not uniform, more detailed investigation is needed. Accordingly, these are the field levels with which overhead power lines (which produce essentially uniform fields near ground level) shall comply where necessary. For other equipment, such as underground cables, which produce non-uniform fields, the equivalent figures will never be lower but may be higher and will need establishing on a case-by-case basis in accordance with the procedures specified by HPA. Further explanation of basic restrictions, reference levels etc is given by the Health Protection Agency."*

2.2.8. The Code of Practice[3] also specifies the land uses where exposure is deemed to be for potentially a significant period of time and therefore where the public guidelines apply. These land uses are, broadly, residential uses and schools.

2.2.9. Therefore, if the EMFs produced by an item of equipment are lower than 9 kV/m and 360 µT, the fields corresponding to the ICNIRP basic restriction, it is compliant with the ICNIRP guidelines and hence with PHE recommendations and Government policy. If the fields are greater than these values, the equipment is still compliant with Government policy if the land use falls outside the residential and other uses specified in the Code of Practice[3] and it may still be compliant if the fields are non-uniform.

2.2.10. This makes it clear that the Government has not introduced any restrictions on constructing new high-voltage equipment close to existing properties on grounds of safety or health risks, and neither is it appropriate for individual local authorities to do so. Therefore, no additional measures or precautions are necessary or appropriate beyond the exposure guidelines and, for overhead lines, the policy on optimum phasing.

[6] National Radiological Protection Board. Review of the scientific evidence for limiting exposure to electromagnetic fields (0-300 GHz). Doc NRPB, 2004, 15(3), p.1

## 2.3. Summary of Policy

2.3.1. The EMF policies applying to high-voltage electricity equipment comprise compliance with the exposure guidelines; for overhead lines, the policy on optimum phasing; the policy on indirect effects expressed in the code of practice; but no other policies. If a development complies with these policies, adequate protection for the public is ensured.

## 2.4. Effects on magnetic compasses

2.4.1. Magnetic compasses, whether traditional magnetic needle designs or alternatives such as fluxgate magnetometers, operate from the Earth's magnetic field, and are susceptible to any perturbation to the Earth's magnetic field by other sources.

2.4.2. This is a potential issue with direct current (DC) conductors or cables, which produce a static magnetic field that perturbs the geomagnetic field. However, there are no DC cables proposed for use in the project and no DC fields could be produced.

2.4.3. The magnetic fields produced by this project would be 50 Hz fields. These oscillate far too quickly (50 times per second) for a magnetic compass needle to be affected. Fluxgate magnetometers are capable of responding to 50 Hz fields, but, when used as a compass, always have filtering to eliminate unwanted frequencies including 50 Hz. They can cease working correctly if saturated by a high-enough field, but the field required is orders of magnitude higher than would be produced by the Project.

2.4.4. Therefore, this project would have no significant effect on magnetic compasses.

## 2.5. Policy Framework for the Protection of marine life

2.5.1. National Policy Statement EN-3[7] for renewable energy infrastructure provides the primary basis for decisions by the Infrastructure Planning Commission (IPC) on applications it receives for nationally significant renewable energy infrastructure.

2.5.2. The key provision in Paragraph 2.6.75 states:

> *"Where it is proposed that mitigation measures of the type set out in paragraph 2.6.76 below are applied to offshore export cables to reduce electromagnetic fields (EMF) the residual effects of EMF on sensitive species from cable infrastructure during operation are not likely to be significant. Once installed, operational EMF impacts are unlikely to be of sufficient range or strength to create a barrier to fish movement"* [8]

2.5.3. The mitigation methods suggested in NPS EN-3 include the use of armoured cables for interarray and export cables, and that cables should be buried at sufficient depths. Burial depth can reduce the magnetic fields at distance but to a lesser extent than cable bundling or compact phase arrangements. Therefore, mitigation of EMF from offshore cables can also occur by the arrangements of the phases in each circuit. The closer the phases in a circuit, the more cancellation of the field occurs and the lower the fields. The use of single 3-core armoured cables, such as proposed for this project, ensures that the phases are in very close proximity, reducing the fields significantly.

### Mechanisms of action between EMF and marine species

2.5.4. A general commentary on the effects of EMF on marine species is included. There are no defined limits in terms of EMF to which the cables need to comply in regard to effects on marine life. The research area is relatively new and there is great deal of uncertainty in the science. A review of the impacts of the EMF assessed in this report should be sought from a marine specialist.

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[7] Department of Energy and Climate Change. National Policy Statement for Renewable Energy Structure (EN-3). London: The Stationary Office, 2011

[8] Bio/Consult, 2005. Infauna monitoring. Horns Rev Offshore Wind Farm. Annual Status Report, 2004, npower Renewables Limited, 2003. Baseline Monitoring Report. North Hoyle Offshore Wind Farm

2.5.5. There are two fields produced by the cables, a magnetic field which in turn causes an induced electric field. The Earth has its own geomagnetic field meaning that these fields are always naturally present. It has been shown that certain species use these natural fields to aid a number of physiological processes.

2.5.6. Marine species have specialised physiology to detect EMF, but the exact mechanisms of detection are complex, and not fully understood[8]. There are no limits above or below which marine AC EMF are known to have a detrimental impact on marine life and a full impact assessment should be considered.

Magnetic fields

2.5.7. Marine organisms can detect magnetic fields directly or indirectly through induced electric field detection. Species with the ability to detect magnetic fields directly do so through the forces on specialied particles called magnetite. Species with magnetite are sensitive to the geomagnetic field and use it for navigation. Examples of these types of species include salmon, lobsters, crabs, and bivalve molluscs.

2.5.8. Some research papers report that AC fields fluctuate too rapidly for the magnetite to respond mechanically to the imposed force, and that magnetite-based receptor systems may not respond to weak AC magnetic fields[1].

2.5.9. A comprehensive literature review commissioned by Scottish Natural Heritage (SNH) in 2010[9] revealed that EMFs from subsea cables may interact with eels if migration routes take them over cables in shallow water but no evidence of deviation from migration routes was recorded. They concluded that:

*"Current knowledge suggests that EMFs from subsea cables and cabling orientation may interact with migrating eels (and possibly salmonids) if their migration or movement routes take them over the cables, particularly in shallow waters (<20m). The effects, if any, could be a relatively trivial temporary change in swimming."*

2.5.10. Some species that are able to detect the geomagnetic field not through magnetite, but through induced electric fields, are described as electrosensitive. These species are able to detect the presence of magnetic fields from electric fields induced by movement of an object or water through the magnetic field. The main species that uses this mechanism is Elasmobranchs. It is generally assumed that the induced electric field mode of detection is used for navigation.

2.5.11. The few studies that have looked at the potential effects of the emitted magnetic fields suggest that migratory fish do not deviate from their normal migration path[10, 11].

Electric fields

2.5.12. Some species, mainly Elasmobranchs, have specialist electroreceptive organs which allow them to sense voltage gradient changes. Sensing the induced electric field is mainly used for prey detection and is highly sensitive allowing very weak voltage gradients to be detected, as low as 5 to 20 nV/m. The electroreceptive organs are only used in close proximity to the prey and are highly tuned for the final stages of feeding or detecting others[12]. From the limited research investigating the potential effects of induced electric fields on various species three area of concerns have arisen:

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[9] Gill, A.B. & Bartlett, M. (2010). Literature review on the potential effects of electromagnetic fields and subsea noise from marine renewable energy developments on Atlantic salmon, sea trout and European eel. Scottish Natural Heritage Commissioned Report No.401.

[10] Westerberg, H & Begout-Anras, M.L. (2000) Orientation of silver eel (Anguilla anguilla) in a disturbed geomagnetic field. Advances in Fish Telemetry. Proceedings of the Third Conference on Fish Telemetry in Europe, Norwich, England, June 1999. Eds. Moore, A. & Russel, I. CEFAS Lowestoft.

[11] Westerberg, H. (2000) Effect of HVDC cables on eel orientation. In Merck, T & von Nordheim, H (eds). Technishe Eingriffe in marine Lebensraume. Published by Bundesamt fur Naturschutz.

[12] Centre for Marine and Coastal Studies Ltd. (CMACS). (2011) West Coast HVDC Link environmental Appraisal-Assessment of EMF effects on sub tidal marine ecology. Internal report

- Repulsion
- Confusion with bioelectric fields
- Physiological effects

2.5.13. Precisely what magnitude of electric field induces an avoidance / repulsion response in Elasmobranchs is uncertain, however current research suggests that the threshold electric field between attraction and avoidance lies somewhere between approximately[12] 400 and 1000 µV/m. It is not clear from the literature which frequencies these apply to or if there are effects outside this range.

2.5.14. A comprehensive review of EMF marine impacts[1] concluded:

*"Most marine species may not sense very low intensity electric or magnetic fields at AC power transmission frequencies, AC magnetic fields at intensities below 5 µT may not be sensed by magnetite-based systems (e.g., mammals, turtles, fish, invertebrates), although this AC threshold is theoretical and remains to be confirmed experimentally. Low intensity AC electric fields induced by power cables may not be sensed directly at distances of more than a few meters by the low-frequency-sensitive ampullary systems of electrosensitive fishes."*

# 3. Baseline Environment

## Onshore

3.1.1. All equipment that generates, distributes or uses electricity produces EMFs. The UK power frequency is 50 Hz, which is the principal frequency of the EMFs produced, although HVDC circuits are also present which will be a source of additional DC fields.

3.1.2. Electric and magnetic fields both occur naturally. The Earth's magnetic field, which is caused mainly by currents circulating in the outer layer of the Earth's core, is approximately 50 μT in the UK. This field may be distorted locally by ferrous minerals or by steelwork such as in buildings. At the Earth's surface there is also a natural electric field, created by electric charges high up in the ionosphere, of approximately 100 V/m in fine weather and more in stormy weather.

3.1.3. As detailed earlier in this report, the Earth's natural electric and magnetic fields are static, and the power system produces alternating fields. In homes in the UK that are not close to high-voltage overhead lines or underground cables, the average "background" power-frequency magnetic field (the field existing over the whole volume of the house) ranges typically from 0.01 – 0.2 μT with an average of approximately 0.05 μT, normally arising from currents in the low voltage distribution circuits that supply electricity to homes. The highest magnetic fields to which most people are exposed in the home arise close to domestic appliances that incorporate motors and transformers. For example, close to their surface, fields can be 2000 μT for electric razors and hair dryers, 800 μT for vacuum cleaners, and 50 μT for washing machines. The electric field in most homes is in the range 1 – 20 V/m, rising to a few hundred V/m close to appliances[13].

3.1.4. Along the proposed cable circuit route there is existing electrical infrastructure which will produce localised 50 Hz EMF.

## Offshore

3.1.5. The current offshore environment where the Green Volt export cables are proposed, has naturally occurring DC magnetic fields, which again is around 50 μT.

3.1.6. The Earth's magnetic field can induce an electric field in sea water. The movement of the sea through the magnetic field will result in a small localised electric field being produced. It has been stated that the magnitude of the electric field induced will be dependent upon magnetic field strength, sea water chemistry, viscosity and its flow velocity and direction relative to the lines of magnetic flux. The background geomagnetic field in the area is around 48 μT. Given this, the background induced electric field could range between 4.8 and 60 μV/m in tidal velocities ranging between 0.1 m/s and 1.25 m/s.

3.1.7. This project operates using AC technology and will not add or subtract to these natural DC fields. AC magnetic fields will, however, induce an electric field within a marine organism located in or moving through the AC magnetic field produced by the cable, which is the important consideration for biological impacts[1]. The induced electric field will depend on the size of the organism, its orientation or direction of travel in the field and how close it is to the cable. These effects tend to be highly localised as magnetic fields from cables reduce quickly with distance from source. The lower the magnetic field, the lower the induced electric field. The effect is greatest when organisms are traveling along the length of the cables. If the organism is at a different angle to the cables or offset to the side of the cables, the induced electric field will be lower because the magnetic fields will be lower.

[13] J. Swanson & D.C. Renew, Power-frequency fields and people, Engineering Science and Education Journal, 1994, p 71

# 4. Description of Green Volt

4.1.1. Green Volt will be developed as HVAC cable circuits operating at 50 Hz. The electrical design parameters of the project are not finalised, but a worst-case scenario in EMF terms has been assessed. Each circuit has been modelled using the maximum current rating for the cables installed, which gives a greater capacity than the project requires, resulting in higher calculated fields.

4.1.2. There are two offshore routes, the first consisting of a maximum of two circuits operating at 66 kV between the platform and windfarm and the second also consisting of a maximum of two circuits, operating at 275 kV between the windfarm and connecting to the existing transmission system near Peterhead. Where the circuits come onshore, only a single circuit is required, but will consist of three individual conductors for each phase, as opposed to the offshore cables which will be a single cable with 3-cores. Descriptions of both offshore routes and the onshore components are provided below and summarised in Table 4.1.

4.1.3. If the voltage of the proposed circuits were to change but the maximum current in the circuits remained the same or lower, these results would remain valid. It is the current which determines the magnetic field and the voltage, in this situation has no bearing on the results.

## 4.2. Offshore route 1: 66 kV between Ettrick and Blackbird field to the Buzzard Platform

4.2.1. Consists of two 66 kV single 3-phase 1000 $mm^2$ export cable circuits installed with a 50 m separation. The maximum current capacity of each circuit is 825 A. Each circuit will have a minimum burial depth of 0.6 m.

## 4.3. Offshore route 2: 275 kV between Ettrick and Blackbird field to Land fall

4.3.1. Consists of two 275 kV single 3-phase 2000 $mm^2$ export cable circuits, each with a maximum circuit rating of 1024 A. Each circuit will have a minimum circuit separation of 50 m and a minimum burial depth of 0.6 m

## 4.4. Onshore section: Land fall to existing transmission system in Peterhead area

4.4.1. The onshore route will consist of one 275 kV 3-phase circuit with a maximum capacity of 1024 A. There are different installation techniques which could be used, each influences the magnetic fields produced; both are described below.

Option A- Flat formation

4.4.2. Cables will be buried to a minimum of 0.9 m, with a horizontal phase separation of 0.25 m.

Option B- Trefoil formation

4.4.3. Cables will be arranged in a triangle formation, with a 0.2 m phase separation and a minimum burial depth of 0.9 m.

**Table 4.1: Volt Green cable geometries and calculation parameters for all electrical designs**

| | Cable circuit route designs | | | |
|---|---|---|---|---|
| | **Offshore Route 1** | **Offshore Route 2** | **Onshore flat design** | **Onshore trefoil design** |
| **No. of circuits** | Two 3-cored cables | Two 3-cored cables | One 3-phase circuit | One 3-phase circuit |
| **Operating voltage** | 66 kV | 275 kV | 275 kV | 275 kV |
| **Cable design** | 1 x 3-cored 1000mm$^2$ | 1 x 3-cored 1000mm$^2$ | 3 x Single cored | 3 x Single cored |
| **Maximum current** | 825 A | 1024 A | 1024 A | 1024 A |
| **Minimum burial depth** | 0.6 m | 0.6 m | 0.9 m | 0.9 m |
| **Circuit separation** | 50 m | 50 m | N/A | N/A |
| **Phase arrangement** | N/A | N/A | Flat horizontally spaced | Triangular |
| **Phase separation** | N/A | N/A | 0.25 m | 0.2 m |

# 5. Assessment methodology

## 5.1. Predicted Field Levels

5.1.1. The magnetic field produced by the currents in an electrical circuit falls with distance from the circuit. The magnetic field is highest at the closest point to the conductors and falls rapidly with distance.

5.1.2. For sources of fields with a simple, defined geometry, such as underground cables, calculations are the best way of assessing fields and are acceptably accurate. The calculations of fields presented here follow the provisions specified in the Code of Practice on Compliance[3] and were performed using specialised computer software that has been validated against direct measurement[14] and commercially available software package EFC-400 (Narda).

5.1.3. Calculations from overhead lines and cables usually assume that the line or cables are infinitely long and straight, known as a two-dimensional calculation. The Code of Practice specifies that such calculations are always acceptable.

5.1.4. Since field strengths are constantly varying, they are usually described by reference to an averaging calculation known as the “root mean square” or RMS. Future mention of power-frequency field strengths in this chapter will mean the RMS amplitude of the power-frequency modulation of the total field, which is the conventional scientific way of expressing these quantities.

5.1.5. A qualitative assessment of offshore EMF emissions has been performed for the specific cable designs considered and burial depths.

5.1.6. To assess compliance with exposure limits for the onshore sections of cable, the Code of Practice on Compliance[3] specifies that the maximum fields the installation is capable of producing should be calculated using the following conditions (other conditions in the Code of Practice apply only to overhead lines and are not reproduced here):

- magnetic fields: for the highest rating that can be applied continuously in an intact system (i.e. including ratings which apply only in cold weather, but not including short-term ratings or ratings which apply only for the duration of a fault elsewhere in the electricity system); and
- electric and magnetic fields: for 1 m above ground level, of the unperturbed field, of the 50 Hz component ignoring harmonics, ignoring zero-sequence currents and voltages and currents induced in the ground or earth wire.

5.1.7. These provisions ensure that the calculations for each of the cable design options represent worst-case conditions. These parameters were used for both the onshore and offshore calculations. The circuits will not always operate at this maximum rating, therefore resulting in lower magnetic fields for some of the time, but compliance is assessed for the worst-case conditions.

5.1.8. These calculations assume that there is no attenuation of magnetic fields from any surrounding material (e.g., seabed, earth, grout mattresses, etc.) and that there are no unbalanced currents flowing along the outer sheaths of the cables. Finally, the effect of the cable armouring (ferromagnetic shielding) to reduce the magnetic field outside the cable was not included. Complex modelling of similar cables demonstrated that the armour cable in fact accounted for a 2-fold reduction in the magnetic field[15]. The modelling assumptions were made to ensure that the calculated magnetic-field levels will overestimate the actual field level at any specified loading.

[14] J. Swanson, Magnetic fields from transmission lines: Comparison of calculations and measurements, IEE Proceedings.-Generator Transmission Distribution, 1995, 142 (5), p481.

[15] M. Silva, E. Zaffanella and J. Daigle. 2006 EMF Study: Long Island Power Authority (LIPA), Offshore Wind Project.

## 5.2. Combining fields from different sources

5.2.1. When more than one source of EMFs is present, such as two different cable circuits, the EMFs can interact with one another, adding or subtracting to the total field. However, this is only the case if the frequencies that the cables operate at are the same. Alternating Current (50 Hz) and Direct Current (0 Hz) fields do not interact with one another due their differing frequencies (Section 1.2) and should be considered separately.

5.2.2. The offshore Green Volt circuits may be installed close to the proposed North Connect high voltage direct current (HVDC) interconnector between Scotland and Norway. There will be no interaction or cumulative impact of these two projects as AC and DC fields do not combine. The impact of each can be considered separately and the High Connect project will not be considered further.

## 5.3. Assessment of Effects

5.3.1. The onshore Green Volt export cables would be assessed as having an adverse effect if non-compliance with the EMF exposure limits was demonstrated, using the principles set out in Codes of Practice[3]. Conversely, as specified in NPS EN-5[2], if the proposed projects comply with the exposure limits, EMF effects are assessed as not significant, and no mitigation is necessary.

5.3.2. For the marine environments, total field values are produced and compared to the requirements of NPS EN-3. For interpretation of the potential impacts on marine life physiology, a marine specialist will need to be consulted.

# 6. Assessment of EMF from Green Volt

## 6.1. Offshore options

6.1.1. The earthed metallic shield that is applied over the insulation of HVAC cables ensures that the electric field will be contained entirely within the insulation, and no external electric field will be emitted.

6.1.2. Magnetic fields are not shielded in the same way as electric fields and will be produced outside the cables, and this has been assessed for each cable route below.

6.1.3. All proposed offshore cable designs consist of two 3-core conductor cables, which vary in cross-sectional area, depending on the required rating. Within each single cable, the 3 conductors vary with distance from one another, which can influence the magnetic field produced. In each scenario the worst-case option was considered.

6.1.4. The magnetic field produced by the cables will in turn induce electric fields in organisms passing through the field. This will be proportional to the magnetic field and the size of the organism. The direction of travel and location over the cables will also be considered.

6.1.5. Magnetic field intensities reduce as a function of distance from the source and are highly localised.

### Magnetic fields

6.1.6. Based on the cable design parameters provided by Floatation Energy (Table 4.1) and performed according to the provisions of the Code of Practice, the AC magnetic fields from each of the proposed offshore export options were calculated. All calculations were performed assuming maximum load, minimum circuit separation and minimum burial depth, giving a worst-case scenario.

6.1.7. Table 6.1 demonstrates the maximum magnetic field for each option at the seabed and with increasing vertical distance. Figure 6.1 shows the magnetic field along the seabed in a horizontal plane for the 66 kV and 275 kV routes. Figure 6.2 demonstrates the vertical reduction in magnetic field from the two offshore routes. Figures 6.3a and 6.3b demonstrate the reduction of magnetic fields with both vertical and horizontal distance from the cable circuits for both routes.

**Table 6.1: Calculated maximum magnetic fields for offshore Green Volt export cable circuits options. Cables are buried with the top of the cable 0.6 m below the seabed**

| | Magnetic field (µT) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Distance above seabed (m) | | | | | | |
| | **Seabed** | **0.5 m** | **1 m** | **2 m** | **5 m** | **10 m** | **20 m** |
| **Offshore route 1- 66 kV** | 35.1 | 12.3 | 6.17 | 2.47 | 0.55 | 0.15 | 0.04 |
| **Offshore route 2- 275 kV** | 54.7 | 19.5 | 9.90 | 3.99 | 0.90 | 0.25 | 0.06 |

**Figure 6.1: Calculated maximum magnetic fields for the 66kV (left hand graph- blue) and 275 kV (right hand graph- green) offshore circuits. Magnetic fields calculated along the seabed perpendicular to the cable circuits.**

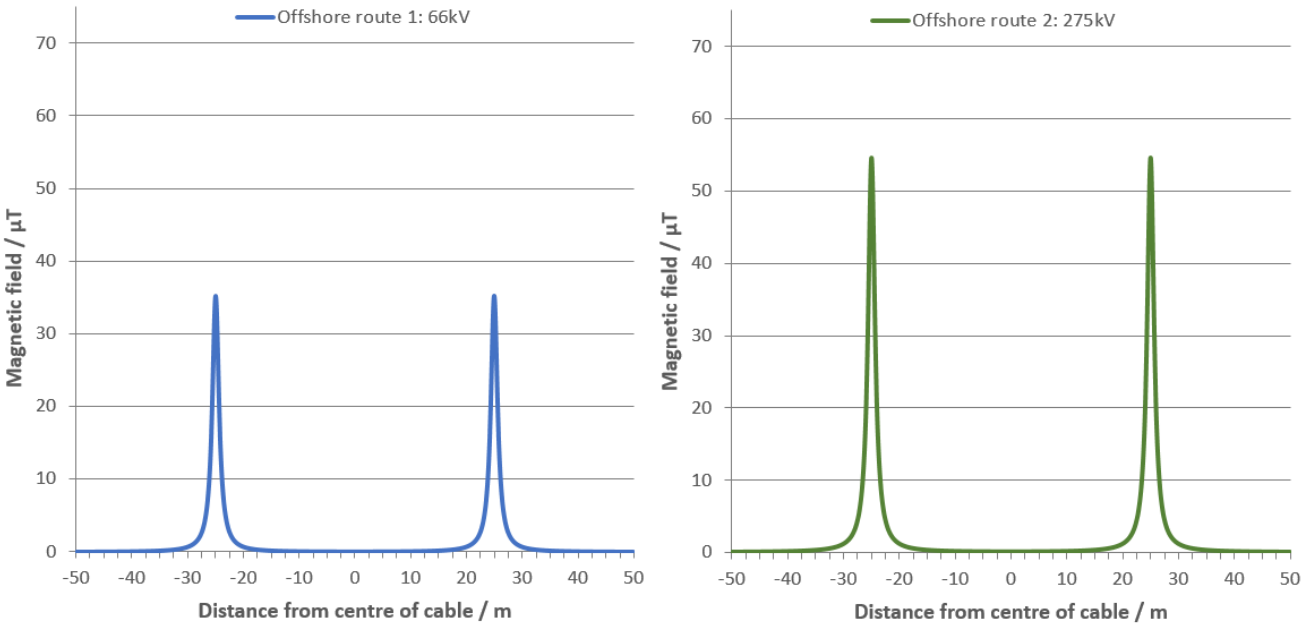



**Figure 6.2: Calculated magnetic fields for the 66 kV and 275 kV offshore circuits with increasing distance from seabed.**

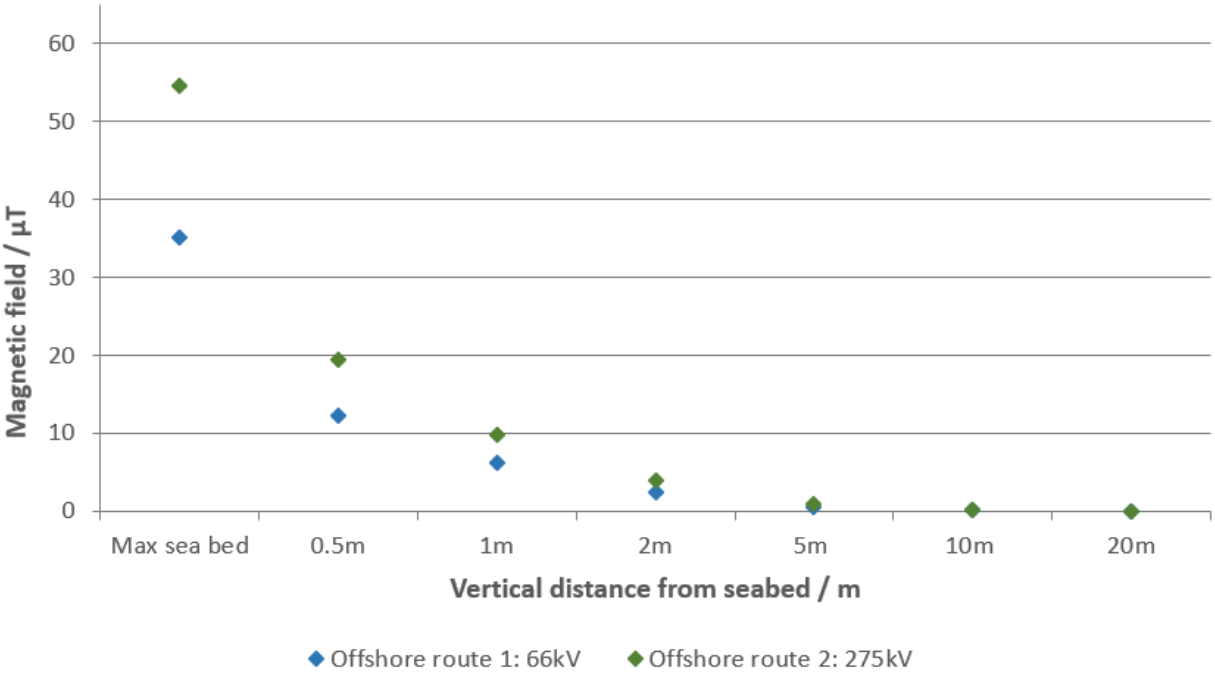


**Figure 6.3a: Calculated AC Magnetic Fields from offshore route 1- 66 kV cable circuit:** The hashed line running horizontally at 0 on the z-axis represents the seabed location. Colour bands represent magnetic field levels in microtesla with scale given below

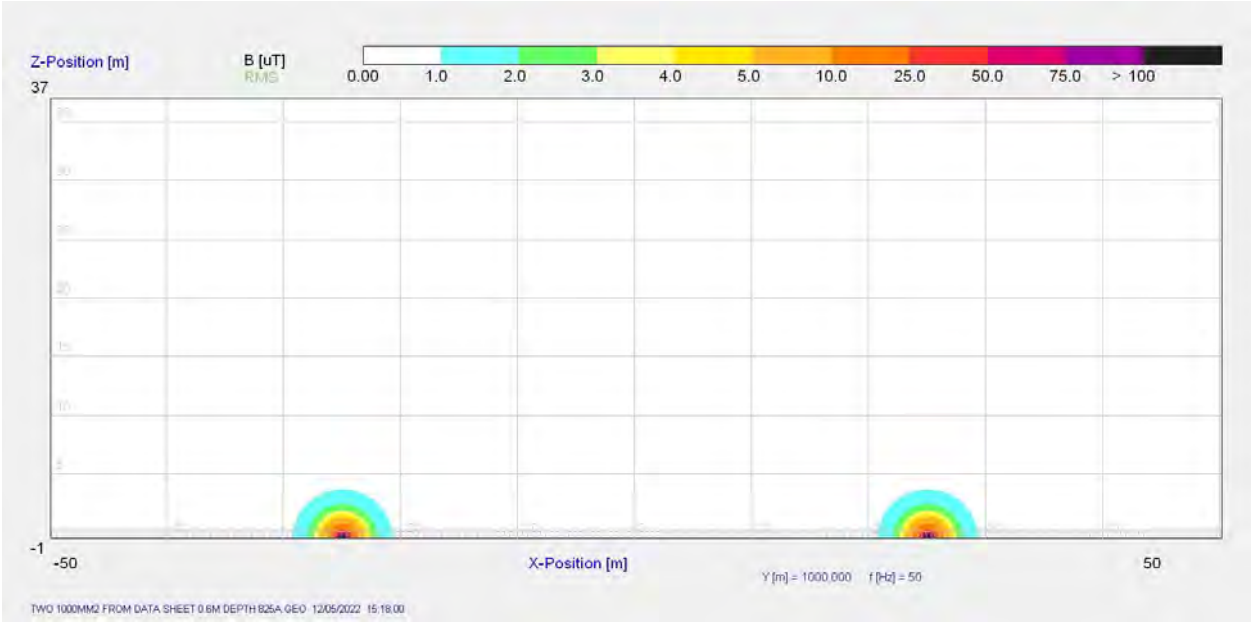
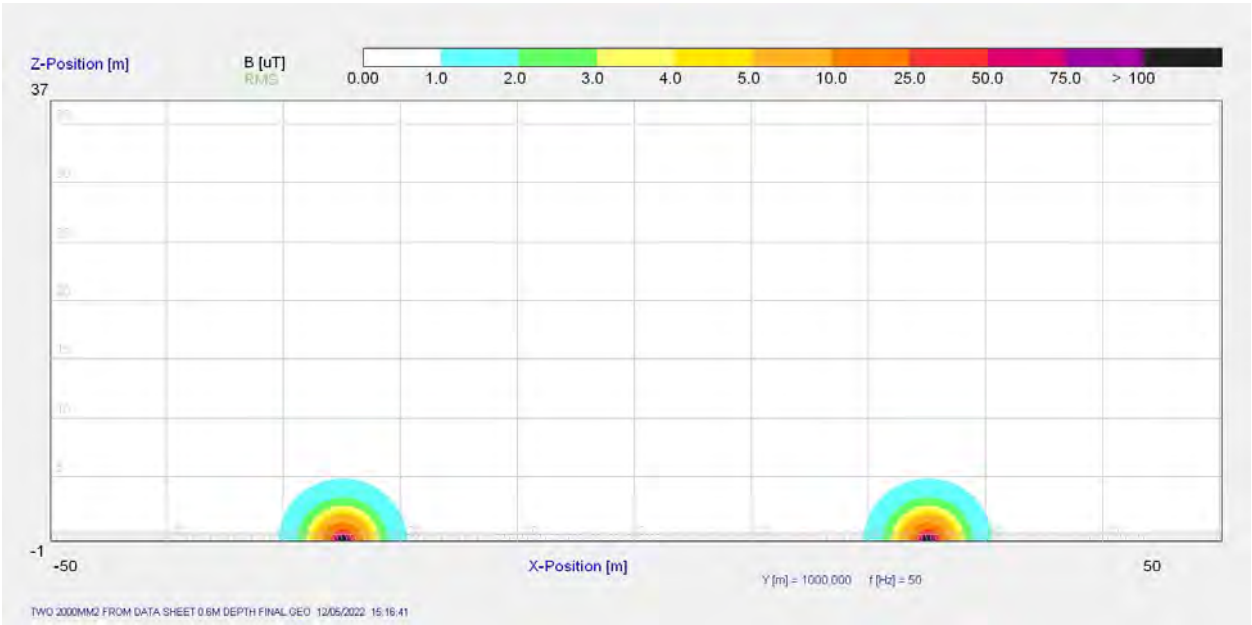



**Figure 6.3b: Calculated AC Magnetic Fields from offshore route 2- 275 kV cable circuit:** The hashed line running horizontally at 0 on the z-axis represents the seabed location. Colour bands represent magnetic field levels in microtesla with scale given below




6.1.8. Unlike DC magnetic fields produced by DC cables, the fields produced by HVAC cables do not combine with the geomagnetic field. The calculations provided are for the total magnetic field without the need to account for the Earth's natural DC field.

6.1.9. The calculated magnetic fields are greatest on the seabed and reduce rapidly with vertical and horizontal distance from the circuits (Figure 6.1, 6.2 and 6.3). The highest magnetic fields were

observed from offshore route 2, operating at 275kV, as these circuits carry a greater current. The maximum magnetic fields calculated for offshore routes 1 and 2 at the seabed were 35.1 µT and 54.7 µT respectively. The magnetic fields from all options reduced to very low levels within a few metres from the circuits. The magnetic fields halved in value 0.8m from the seabed and reduced to below 1µT, 5m from the seabed. It is important to note that these levels do not take account of shielding factors of the cable sheath which would further reduce the fields.

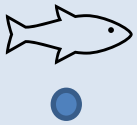
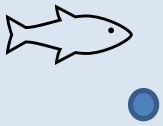
### Induced electric fields

6.1.10. The induced electric field within an organism is directly related to the size of the magnetic field, the size of the organism and, for large organisms, orientation over the cables. The method used to calculate the induced electric field is that noted in the BOEMRE report[1] and derived from Reilly[16].

6.1.11. Reilly's[16] method is used to calculate the induced electric field in the elliptical cross-sectional area of the organism as a function of the uniform magnetic field, the dimensions of the ellipse and the location within the ellipse. The induced electric field is calculated in vertical and horizontal layers through the organism. The important quantity that determines the induced electric field is the total magnetic flux through that cross section. Near to cables, the magnetic field is very non-uniform. Where an organism is small (say <10cm) this is not an issue because the magnetic field does not vary significantly over the entire volume of the organism. However, where an organism is large, the average magnetic field over the cross-section of the organism is used to represent the uniform magnetic field of the Reilly model. For this, averages of the magnetic field over the vertical cross-sections of all the organisms were calculated and these were averaged over the width of the organism. This model calculated the induced electric field for the average magnetic field over the entire organism. This is an approximation and leaves the possibility of that the variation of field across the organism results in a local increase of induced electric field. If there is a specific area of the organism where results should be focused, further calculations would be necessary.

6.1.12. For larger organisms, three orientations relative to the cable where considered, described in Table 6.2.

**Table 6.2**: Modelled organism orientations relative to the cable.

| | 1 | 2 | 3 |
|---|---|---|---|
| **Direction of travel** | Along cable | Perpendicular to cable | Perpendicular to cable |
| **Location relative to cable** | Centred | Centred | Offset- one end of organism directly above cable |
| **Diagrammatic representation of organism location** |  |  |  |

[16] P. Reilly. 1991. Magnetic field excitation of peripheral nerves and the heart: a comparison of thresholds. Ned. & Biol. Eng. & Comput., 28: 571-579.

**Table 6.3**: Marine species modelled for induced electric field effects. The maximum dimensions of each species used are included. **Bottlenose Dolphin height excludes fin*

| | Species Dimensions | | |
|---|---|---|---|
| | Length (cm) | Width (cm) | Height (cm) |
| **Mammals** | | | |
| *Harbour porpoise* | 190 | 35 | 35 |
| *Bottlenose dolphin* | 300 | 80 | 80* |
| *Minke whale* | 850 | 400 | 400 |
| **Fish and Shellfish** | | | |
| *Common ray* | 285 | 200 | 70 |
| *Brown crab* | 10 | 25 | 5 |
| *Salmon* | 100 | 11.5 | 23 |

6.1.13. The modelled induced electric field was assessed for three marine mammals, two fish and one representative shellfish. These modelled induced electric fields were calculated considering the orientation and proximity of the organism to the cables, as described in Table 6.2 and the dimensions of each organism, noted in Table 6.3. Appropriate magnetic field values or averages were then calculated depending on the organism's size at various vertical distances from the cables. Calculations of induced electric fields are presented for each route and each species considered, along with orientation of travel, in Tables 6.4 and 6.5.

6.1.14. As the induced electric fields are directly proportional to the magnetic field, as expected the greatest induced electric fields were observed when considering the 275 kV circuits. The induced electric field reduced with vertical and horizontal distance from the cable circuits. The induced electric fields are also highest when the organisms are positioned along the length of the cables, rather than perpendicular.

6.1.15. The predicted induced electric field was greatest in the Common Ray, where it was located along the cables at the seabed. At this location, the induced electric field reached a maximum of 4.6 mV/m. This reduced to 3.9 and 2.5 mV/m when the Common Ray was orientated perpendicular to the cables. Increasing its vertical height above the cables also significantly reduced the predicted induced electric field. In the worst-case orientation, i.e., along the cables, the induced electric fields reduce by more than a factor of three at 1 m above the cables, from 4.6 mV/m to 1.4 mV/m. At 5 m from the cables, the induced electric field had reduced significantly, ranging between 11 and 57 times smaller than the induced electric field at the seabed, depending on the species. These reductions at vertical and horizontal distance were observed in all species. The smaller the species the smaller the predicted induced electric field.

6.1.16. The induced electric field would also only persist whilst the organism is within the magnetic field. For comparison, the public exposure limit for induced electric fields in humans is 20mV/m in the head and 400 mV/m for the whole body.

**Table 6.4:** Modelled maximum induced electric field (μV/m) in six species at various distances above Route 1: 66 kV cable circuits.

| Electric field (μV/m) | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Distance above seabed (m) | | | | | | |
| Organism orientation (Table 6.2) | Seabed | 0.5 m | 1 m | 2 m | 5 m | 10 m | 20 m |
| **Harbour porpoise** | | | | | | | |
| **1** | 1272 | 509 | 273 | 116 | 27.7 | 7.9 | 2.0 |
| **2** | 930 | 437 | 250 | 112 | 27.4 | 7.9 | 2.0 |
| **3** | 641 | 339 | 209 | 102 | 26.6 | 7.7 | 2.0 |
| **Bottlenose dolphin** | | | | | | | |
| **1** | 1,871 | 853 | 489 | 222 | 56.7 | 16.7 | 4.3 |
| **2** | 1,279 | 687 | 426 | 208 | 55.7 | 16.6 | 4.3 |
| **3** | 832 | 492 | 329 | 177 | 52.7 | 16.2 | 4.2 |
| **Minke whale** | | | | | | | |
| **1** | 1,832 | 1165 | 819 | 473 | 162 | 56.2 | 16.5 |
| **2** | 1,183 | 822 | 617 | 390 | 150 | 54.6 | 16.3 |
| **3** | 705 | 513 | 403 | 275 | 122 | 48.4 | 14.7 |
| **Common ray** | | | | | | | |
| **1** | 2,911 | 1445 | 857 | 399 | 103 | 30.1 | 7.8 |
| **2** | 2,423 | 1286 | 792 | 383 | 102 | 30.0 | 7.8 |
| **3** | 1,564 | 916 | 610 | 326 | 95.9 | 29.2 | 7.6 |
| **Brown crab** | | | | | | | |
| **1** | 178 | 63.8 | 32.5 | 13.1 | 3.0 | 0.8 | 0.2 |
| **2** | 178 | 63.8 | 32.5 | 13.1 | 3.0 | 0.8 | 0.2 |
| **3** | 178 | 63.8 | 32.5 | 13.1 | 3.0 | 0.8 | 0.2 |
| **Salmon** | | | | | | | |
| **1** | 469 | 183 | 96.2 | 40.3 | 9.5 | 2.7 | 0.7 |
| **2** | 418 | 173 | 93.7 | 39.8 | 9.5 | 2.7 | 0.7 |
| **3** | 340 | 156 | 87.9 | 38.7 | 9.4 | 2.7 | 0.7 |

**Table 6.5:** Modelled maximum induced electric field (μV/m) in six species at various distances above Route 2: 275kV cable circuits.

| | Electric field (μV/m) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Distance above seabed (m) | | | | | | |
| Organism orientation (Table 6.2) | Seabed | 0.5 m | 1 m | 2 m | 5 m | 10 m | 20 m |
| **Harbour porpoise** | | | | | | | |
| 1 | 1996 | 812 | 439 | 188 | 45.2 | 12.9 | 3.3 |
| 2 | 1474 | 699 | 403 | 181 | 44.7 | 12.8 | 3.3 |
| 3 | 1021 | 544 | 338 | 165 | 43.5 | 12.7 | 3.2 |
| **Bottlenose dolphin** | | | | | | | |
| 1 | 2,958 | 1,366 | 788 | 361 | 92.6 | 27.3 | 7.1 |
| 2 | 2,041 | 1,104 | 688 | 337 | 90.9 | 27.1 | 7.1 |
| 3 | 1,333 | 794 | 533 | 288 | 86.0 | 26.4 | 6.9 |
| **Minke whale** | | | | | | | |
| 1 | 2,946 | 1,884 | 1327 | 769 | 265 | 92.0 | 27.0 |
| 2 | 1,910 | 1,332 | 1003 | 636 | 245 | 89.4 | 26.7 |
| 3 | 1,140 | 834 | 656 | 448 | 200 | 79.3 | 24.0 |
| **Common ray** | | | | | | | |
| 1 | 4,627 | 2,318 | 1,381 | 646 | 167 | 49.3 | 12.8 |
| 2 | 3,863 | 2,067 | 1,279 | 621 | 166 | 49.1 | 12.8 |
| 3 | 2,505 | 1,478 | 987 | 529 | 157 | 47.9 | 12.5 |
| **Brown crab** | | | | | | | |
| 1 | 278 | 102 | 52.1 | 21.2 | 4.8 | 1.3 | 0.3 |
| 2 | 278 | 102 | 52.1 | 21.2 | 4.8 | 1.3 | 0.3 |
| 3 | 278 | 102 | 52.1 | 21.2 | 4.8 | 1.3 | 0.3 |
| **Salmon** | | | | | | | |
| 1 | 735 | 290 | 155 | 65.2 | 15.5 | 4.4 | 1.1 |
| 2 | 657 | 277 | 151 | 64.5 | 15.5 | 4.4 | 1.1 |
| 3 | 539 | 249 | 142 | 62.7 | 15.4 | 4.3 | 1.1 |

## 6.2. Onshore circuits assessment

6.2.1. The earthed metallic shield that is applied over the insulation of HVAC cables ensures that the electric field will be contained entirely within the insulation, and no external electric field will be emitted.

6.2.2. Magnetic fields are not shielded in the same way as electric fields and will be produced outside the cables, and this has been assessed for each technology option and installation scenario below.

### Electric fields

6.2.3. The earthed metallic shield that is applied over the insulation of the AC cables, which is an inherent part of the cable design, ensures that the electric field is contained within the cable, not leaking out.

6.2.4. The proposed underground cables produce no external electric fields, so are not considered further.

### Magnetic fields

6.2.5. The AC magnetic fields from the two potential installation techniques were calculated based on the cable design parameters provided by Flotation Energy (Table 4.1) and in accordance with the provisions of the Code of Practice. All calculations were performed assuming maximum load, minimum phase separation and minimum burial depth, giving a worst-case scenario.

6.2.6. Figure 6.4 shows the magnetic field at 1m above ground for the flat and trefoil formation designs considered for the onshore route. Figure 6.5 shows the same calculated field as in Figure 6.4, but with the addition of the Government public exposure limit.

**Figure 6.4: Maximum calculated magnetic fields from onshore 275 kV cable circuit. Two installation techniques were calculated for a flat formation (red) and trefoil formation (orange) design.**

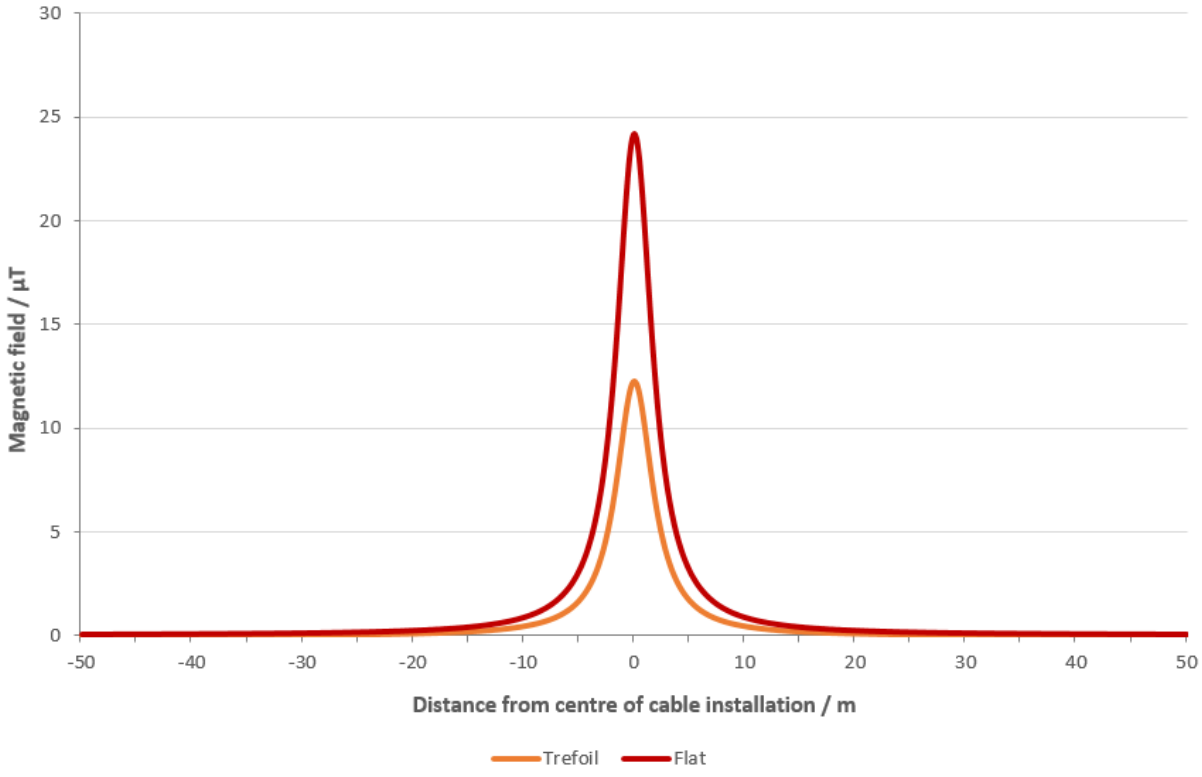
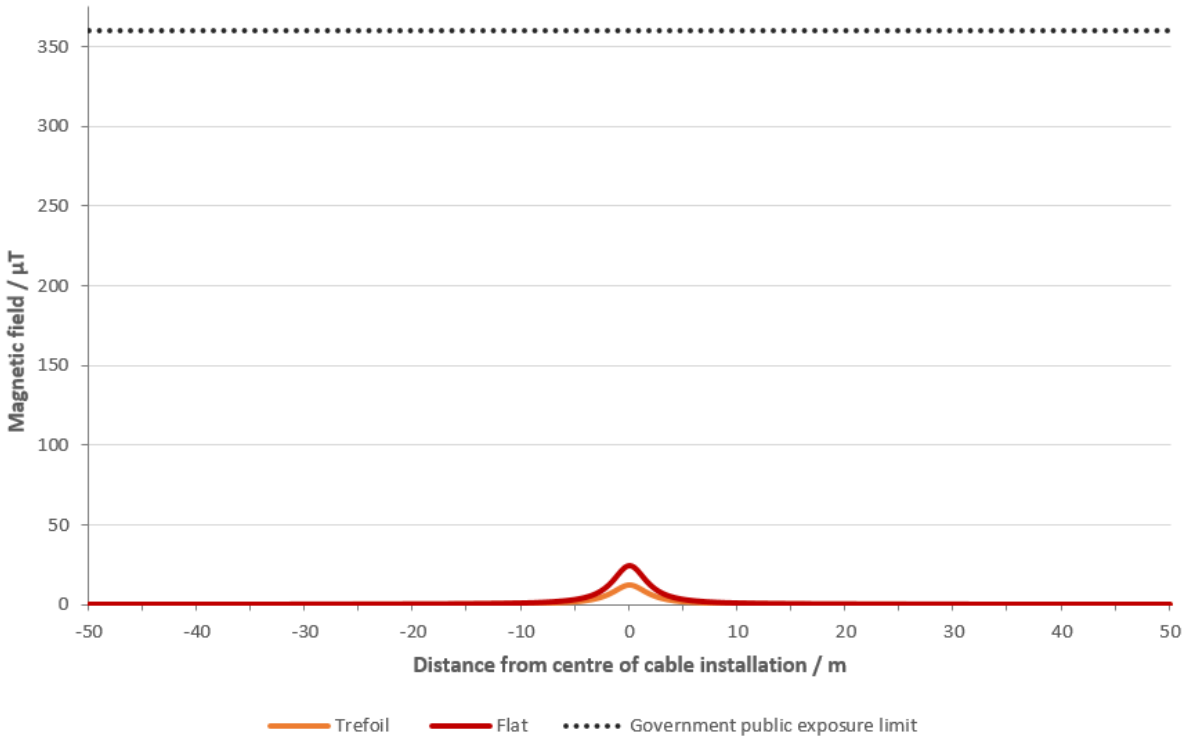


**Figure 6.5: Maximum calculated magnetic fields from onshore 275 kV cable circuit. Two installation techniques were calculated for a flat formation (red) and trefoil formation (orange) design. The Government public exposure limit is marked as a dotted black line.**




6.2.7. Figure 6.4 shows the maximum calculated magnetic field at 1 m above ground and how the field reduces with distance for the two installation options. Installing the circuit in flat formation results in slightly higher magnetic fields which reduce less quickly than if the circuit was installed in a trefoil formation. The maximum magnetic field from the trefoil installation was 12.3 µT compared to 24.2 µT in a flat formation.

6.2.8. The magnetic fields from both trefoil and flat installations reduce quickly with distance. Even using worst-case conditions, the fields have reduced to a background field level 16m from the trefoil arrangement and 21m from the flat formation installation.

## 6.3. Summary of Assessment

### Offshore summary

6.3.1. The magnetic fields produced by both cable routes were highly localised, reducing rapidly from the source due to the singe 3-core cables used. The decrease in magnetic fields occurs both in the vertical water column and horizontally along the seabed. The magnetic fields reduced to below 1 µT at a distance of 5.5 m for the 275 kV cables and 4.3 m from the 66 kV cables.

6.3.2. AC magnetic fields induce electric fields within organisms, which vary with the size of the organism, orientation and magnetic field strength. The impact of external electric fields, especially those induced by AC fields is unclear, but using worst-case assumptions, the maximum predicted induced electric field of 4.6 mV/m was observed in the Common Ray orientated along the cables at the seabed.

### Onshore summary

6.3.3. For onshore power-frequency (AC) fields, the maximum EMF produced is less than the relevant exposure limit. Therefore, all installation options are compliant with the policies in place in the UK to protect public health and are assessed as having no significant adverse effects.

6.3.4. All of the electrical connection options assessed produced magnetic fields significantly below the ICNIRP public exposure limits. Under maximum loading conditions and a flat formation installation, the maximum calculated magnetic fields were less than 7% of the exposure limit.

## 7. Additional Mitigation

### Offshore

5.1.1. National Policy Statement EN-3 states that "*Where it is proposed that mitigation measures of the type set out in paragraph 2.6.76 below are applied to offshore export cables to reduce electromagnetic fields (EMF) the residual effects of EMF on sensitive species from cable infrastructure during operation are not likely to be significant. Once installed, operational EMF impacts are unlikely to be of sufficient range or strength to create a barrier to fish movement*"

5.1.2. The Green Volt project proposes to use armoured cables which mitigates both the electric and to an extent the magnetic fields. Cables have also been buried to a depth of 0.6 m, which again reduces the magnetic fields and is a suggested mitigation technique in NPS EN-3.

5.1.3. NPS EN-3 states a recommended burial depth of 1.5 m to mitigate against EMF impacts, which could be considered. However, the use of single 3-core cables ensures magnetic fields reduce very quickly with distance and ensures that the fields remain highly localised.

### Onshore

5.1.4. No mitigation measures for this cable design are necessary as both technology options have been demonstrated to comply with the current public exposure guidelines as detailed in NPS EN-5[2]. If these requirements are met NPS EN-5[2] states that *"no further mitigation should be necessary."*

## 8. Conclusions

### Offshore

5.1.5. There are no formal limits for EMF exposure which apply to the marine environment. The Green Volt offshore export circuits use armoured cables and cable burial to mitigate the impacts of EMF on marine life. The use of single 3-core cables, compacting the circuit phases, also reduces and localises the EMFs significantly.

5.1.6. The mitigation techniques employed by the project should be sufficient to reduce the impacts of EMF on marine life. The opinions of a marine specialist should be sought.

### Onshore

5.1.7. The Government, acting on the advice of authoritative scientific bodies, has put in place appropriate measures to protect the public from EMFs. These measures comprise compliance with the relevant exposure limits, and one additional precautionary measure, optimum phasing, applying only to high-voltage overhead power lines. These measures are set out in a Written Ministerial Statement, National Policy statement EN-5, and various Codes of Practice.

5.1.8. All of the proposed onshore Green Volt cable designs would be fully compliant with the Government policy. Specifically, all the fields produced would be below the relevant exposure limits. Therefore, there would be no significant EMF effects resulting from this proposed development.

GREEN VOLT

# Appendix 6.1

## Habitat Survey and National Vegetation Classification

Onshore EIA Report: Volume 3

IMTeco Ltd

# Appendix 6.1
# Habitats Survey & National Vegetation Classification

Green Volt Onshore Infrastructure,
Cable Route Corridor,
Peterhead to New Deer
Aberdeenshire

July 2023

*IMTeco Ltd*

IMTeco Ltd

**Notes**:

Site: Green Volt Onshore Infrastructure, Peterhead to New Deer.
Applicant: Green Volt Offshore Windfarm Ltd
Date:01/08/2023
Status: Final

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| | | | | |
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# CONTENTS

# 1 INTRODUCTION

## 1.1 Purpose of this Report

IMTeco Ltd was commissioned by Green Cat Renewables Ltd, on behalf of Floatation Energy, to map and detail individual plant species, undertake a National Vegetation Classification (NVC) and habitats survey at the Proposed Development for an onshore cable route for the Offshore Project. The Applicant for this Proposed Development is Green Volt Offshore Windfarm Ltd.

The Offshore Project is being proposed and intended to be operational by 2026. Generated power will be exported by means of a subsea cable that will landfall on the East Scottish coast north of Peterhead. The Proposed Development is approximately 35km in length running east to west from the Landfall approximately 1.25km north of Peterhead to the Substation Compound which is approximately 1km southeast of the National Grid New Deer Substation.

The onshore cables are to be generally laid in an open cut trench (i.e., excavating down to the required depth, installing the duct, and then backfilling), except where there are geographical or environmental constraints that would prohibit open cut trenching. At these locations, it is intended to use trenchless techniques.

In summary, the Proposed Development consists of the onshore infrastructure development, including all ancillary infrastructure.

The aim of the National Vegetation Classification (NVC) survey is to identify and map the vegetation communities present within the Site to identify those areas of greatest ecological interest. This would include Annex 1 Habitats[1], potential Ground Water Dependent Terrestrial Ecosystems (GWDTE)[2] and Scottish Biodiversity List (SBL)[3] priority habitats.

The NVC 'study area' for the Proposed Development covers the extent of the Proposed Development with survey buffers (Figure 1) as follows:

- 250m buffer out with the Application Site Boundary (as per GWDTE guidance, SEPA, 2017a, 2017b).

[1] As defined by the Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora – the 'Habitats Directive'
[2] As defined within SEPA (2017, Ver 3). Guidance Note 31: Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Available for download from https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf.
[3] Scottish Biodiversity List https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list

This report details the findings of the NVC surveys and incorporates the assessment of the value of the habitats, likely impacts upon them and how these impacts might be mitigated.

The survey area (termed 'the Site' throughout this report) includes all areas within the 250m Ecological Survey Area (ESA) boundary of the Cable Route Corridor and infrastructure, for all survey components which include a habitat survey utilising the Phase 1, NVC and GWDTE classification.

The surveys were undertaken by Irene Tierney, Principal Ecologist and full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).

## 1.2 Ecological Context

The Site is situated in an area of mostly agricultural land with localised areas of woodland and stretches from beach and dune systems through coastal agricultural plains and onto farmland with woodland areas. There are areas of agricultural fields (crop and modified grassland), marshy grassland, scrub, woodland with a mix of commercial conifer plantations, ancient and native woodlands, individual trees, lines of trees and hedges.

## 1.3 Policy & Legal Context

Guidance for assessing the potential impact of the Proposed Development on the ecological features of the development site will be based on the following statutory, general, and national guidance listed in Appendix A. Any appropriate local policy and guidance will also be considered.

# 2 METHODS

## 2.1 Background Data Search

A search was made for reference materials relating to the ecology of the Site, and list of sources is given in Table 1. The Site lies within Aberdeenshire Council.

**Table 1: Data sources.**

| Information Obtained | Available From |
|---|---|
| Designated site locations and citations/Protected areas | SiteLink Nature.scot (https://sitelink.nature.scot/map) |
| Designated site locations and citations | NatureScot (https://www.nature.scot) |
| Designations and legal protection of noteworthy species | Joint Nature Conservation Committee (JNCC: https://jncc.gov.uk) |
| Geographic information about the natural environment | Magic Map DEFRA (https://magic.defra.gov.uk/home.htm) |
| Ancient Woodland Inventory,<br>Commercial Plantation Plans<br><br>Native Woodland Survey Scotland | Scottish Forestry (https://forestry.gov.scot/ https://forestry.gov.scot/support-regulations/scottish-forestry-map-viewer)<br>Scotland's Environment (https://www.environment.gov.scot)<br>Magic Map (https://magic.defra.gov.uk/home.htm) |
| Scottish Wildlife Trust (for information on Local Nature Reserves) | https://scottishwildlifetrust.org.uk |
| River Quality & Catchments<br><br>SEPA Water Classification Hub<br>Scotland's Soil Map (Carbon and peatland 2016 map) | Scotland's Environment (https://www.environment.gov.scot)<br>SEPA Water Classification Hub (https://www.sepa.org.uk/data-visualisation/water-classification-hub/)<br>Carbon and Peatland 2016 Map (https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/) |
| Aberdeenshire Local Development Plan 2023 (January 2023) | https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2023/<br>(https://storymaps.arcgis.com/stories/27f01f5e60544ece88580ca32dc4beb5)<br>and Development Plan Scheme 2023 (https://www.aberdeenshire.gov.uk/media/27636/development-plan-scheme-2023.pdf)<br>Aberdeenshire Coastal Zone (https://online.aberdeenshire.gov.uk/ldpmedia/LDP2021/Appendix5CoastalZone.pdf) |

| | |
|---|---|
| Aberdeenshire Nature Conservation | Aberdeenshire Local Nature Conservation Sites (https://online.aberdeenshire.gov.uk/ldpmedia/LDP2021/Appendix12LocalNatureConservationSites.pdf)<br><br>Nature Conservation and Biodiversity (https://www.aberdeenshire.gov.uk/environment/natural-heritage/biodiversity/#:~:text=Policy%20P1%20of%20the%20Aberdeenshire,the%20scale%20of%20the%20development) |
| North East Scotland Biodiversity Partnership | https://www.nesbiodiversity.org.uk<br>(c/o The James Hutton Institute) |
| Aberdeenshire Council Pollinator Action Plan 2022 to 2027 | Pollinator Action Plan: (https://www.aberdeenshire.gov.uk/media/27229/pollinatoractionplan.pdf) |
| Biological Data Records | NESBReC, Natural Environment Team, Aberdeenshire Council (https://nesbrec.org.uk/) |

A search was made for information on statutory designated sites (Internationally and Nationally important sites for ecology) within 5 km of the Application Site Boundary and non-statutory designated sites (important in a local context) within 2 km. A search was also made for records of noteworthy species within 2 km of the Application Site Boundary. Species included in the search parameters were:

- All wild plant and fungi species receive a level of protection under the Wildlife and Countryside Act 1981 (as amended). Some more rare or vulnerable species are given added protection under Schedule 8[4] of the same Act.
- Three Scottish plant species are European protected species:
  - Killarney fern
  - Slender naiad
  - Yellow marsh saxifrage

These species receive protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

- Species listed as critically endangered, endangered or vulnerable on the IUCN Red List[5]
- Nationally rare or nationally scarce species;
- Notable Species that have action plans under the Scottish Biodiversity List (SBL[6]) or are priority species under the Local Biodiversity Action Plan.

[4] Protected species list - WCA schedule 8: https://www.nature.scot/doc/protected-species-list-wca-schedule-8
[5] IUCN Red List: https://www.iucnredlist.org
[6] Scottish Biodiversity List: https://www.nature.scot/doc/scottish-biodiversity-list

- Biological records were sought from NESBReC, Natural Environment Team, Aberdeenshire Council[7].

## 2.2 Habitat Surveys

Habitat field surveys were undertaken in August 2022 to May 2023. The surveys included searches for scarce or rare plants.

The habitat surveys included the Phase 1 habitat survey approach (Joint Nature Conservation Committee 2010). This involves the following elements.

- Habitat mapping using a set of standard colour codes to indicate habitat types on a Phase 1 habitat map.
- Description of features of possible ecological or nature conservation interest in notes relating to numbered locations on the Phase 1 habitat map, called 'target notes'.

Phase 1 habitat survey methods are described in Joint Nature Conservation Committee (JNCC 2010) and target notes are included.

Plant nomenclature in this report follows Stace (2010) for native and naturalised species of vascular plant. Plant names in the text are given with the common name first, followed by the scientific name in brackets.

The Phase 1 characterisation has been utilised to allow a broader visual representation of the habitats within the study area. The NVC data should be referred to for further detail in any specific area.

## 2.3 National Vegetation Classification Survey

The NVC survey followed JNCC guidance (Rodwell, 2006), enabling the identification and recording of vegetation communities, using the descriptions and keys in the NVC handbooks (Rodwell, 1991 et seq). Individual plants and plant communities (or mosaics and transitions thereof) were recorded with the use of quadrats and whole community species lists compiled. The vegetation was classified to NVC sub-community level wherever possible, but only to NVC community level where sub-community determination was unclear. Most of the vegetation found in this survey was classified to NVC types where appropriate.

Complex mosaics of two or more habitats were mapped as mosaic polygons on high resolution 1:5000 aerial imagery field maps. These polygons were surveyed qualitatively

[7] NESBReC https://nesbrec.org.uk/

to record dominant and constant species, sub-dominant species and other notable species found.

Vascular plants follow the nomenclature of The Botanical Society for the British Isles database (BSBI[8]) with all other flora and fauna following the UK Species Inventory (Natural History Museum[9]), New Flora of the British Isles, Third edition (Stace, 2010), Atherton et al (2010) for bryophytes and Purvis. W. (2000) for lichens.

## 2.4 Invasive Non-Native Plant Species

Invasive plant species surveys were included within the surveys and if they were observed during the normal course of the survey e.g. Japanese knotweed (*Fallopia japonica*), giant hogweed (*Heracleum mantegazzianum*), Indian balsam (*Impatiens glandulifera*), they were noted within the report.

## 2.5 Survey Constraints

Habitat surveys and botanical surveys done in early spring, late autumn or winter are generally considered non-optimal. They can usually describe habitat types adequately, but many plant species (including invasive species) may be unidentifiable or altogether died-away.

While all significant plant species have probably been recorded, it is possible that some species, including invasive species, may have been missed or under-reported if surveys are undertaken out of season.

The NVC system does not cover all possible semi-natural vegetation or habitat types that may be found and since the NVC was adopted for use, further survey work has increased knowledge of vegetation communities that has led to additional communities being described. These new descriptions of communities do not fall within the present NVC system, and where these occur such communities are found and recorded and given a non-NVC community code with a description.

Botanical lists should not be considered fully comprehensive, as rarely occurring or early or late-flowering species may have been missed. However, this would not affect the broader assessment of the ecological value of the Site and its habitats.

[8] https://database.bsbi.org
[9] https://www.nhm.ac.uk/our-science/data/uk-species/species/index.html

## 2.6 Data Collection & Assessment

Following NVC Data Collection, habitats were assessed for their potential to be on the Scottish Biodiversity List (SBL), Annex 1, or a UK Biodiversity Action Plan (UKBAP) priority habitat[10]. An assessment was undertaken using the NVC data to identify potential Groundwater Dependent Terrestrial Ecosystems (GWDTE) within the survey area.

[10] https://hub.jncc.gov.uk/assets/2728792c-c8c6-4b8c-9ccd-a908cb0f1432

# 3 RESULTS

## 3.1 Background Data Search

### 3.1.1 Biodiversity

The Aberdeenshire Council website was searched for all relevant and up to date information regarding biodiversity, which included the North East Scotland Biodiversity Partnership[11], Aberdeenshire Local Nature Reserves and Conservation Sites[12], Aberdeenshire Council Nature Conservation[13] and the Aberdeenshire Council Pollinator Action Plan 2022 to 2027[14]. Information was searched on The Scottish Wildlife Trust[15] for reserves in the area.

### 3.1.2 Designated Sites

***Statutory Sites***

There are five statutory designated sites (Figure 2) within 5 km of the Application Site Boundary, and they are listed in Table 2.

**Table 2: Statutory designated sites within 5 km of the site.**

| Site of Interest | Distance from site (approx.) | Description/Qualifying Features of Interest only | Condition (at last assessed date) |
|---|---|---|---|
| **Sites of Special Scientific Interest & Special Areas of Conservation** | | | |
| **Rora Moss SSSI[16]** | 2.08km | Raised bog | Unfavourable No change, 21 Jun 2012 |
| **Kirkhill SSSI[17]** | 3.93km | Quaternary of Scotland | Favourable Maintained, 7 Jul 2010 |
| **Moss of Cruden SSSI[18]** | 4.36km | Quaternary of Scotland | Favourable Maintained, 8 Jun 2007 |
| **Gight Woods SSSI[19]** | 4.26 | Upland mixed ash woodland<br>Upland oak woodland | Favourable Declining, 1 May 2013<br>Favourable Maintained, 19 Mar 1999 |

[11] https://www.nesbiodiversity.org.uk/our-biodiversity-in-the-north-east-of-scotland/
[12] https://www.aberdeenshire.gov.uk/environment/natural-heritage/local-nature-reserves/
[13] https://www.aberdeenshire.gov.uk/environment/natural-heritage/biodiversity/
[14] https://www.aberdeenshire.gov.uk/media/27229/pollinatoractionplan.pdf
[15] https://scottishwildlifetrust.org.uk/
[16] https://sitelink.nature.scot/site/1371
[17] https://sitelink.nature.scot/site/872
[18] https://sitelink.nature.scot/site/1197
[19] https://sitelink.nature.scot/site/687

| Site of Interest | Distance from site (approx.) | Description/Qualifying Features of Interest only | Condition (at last assessed date) |
|---|---|---|---|
| **Windy Hills SSSI**[20] | 4.37km | Quaternary of Scotland | Favourable Maintained, 15 May 2007 |

***Non-statutory Sites***

There are three local conservation sites within the 2km of the Site (Figure 3). There are woodlands designated in the Ancient Woodland Inventory and Native Woodland Survey of Scotland (NWSS) sites within 2 km of the Application Site Boundary (Table 3 and Figure 4). Only those within the 250m buffer from the Application Site Boundary are listed in Table 3. There are conifer plantations listed within the National Forestry Inventory within the 250m survey buffer for the Site and within the 2km buffer.

**Table 3: Non-statutory designated sites within 2 km of the Site.**

| Site of Interest | Distance from site (approx.) | Description/Qualifying Features of Interest only |
|---|---|---|
| **Native Woodland Survey Scotland (main ones listed only)** | | |
| **Lowland mixed deciduous woodland (multiple)** | 42m | Mixed mature<br>Young pole, immature<br>Established regeneration<br>Pole immature |
| **Wet woodland (multiple)** | 200m<br>32m<br>0m | Young pole, immature<br>Mixed Pole immature, mainly broadleaved<br>Young pole, immature (Mixed mainly conifer) |
| **Unidentifiable type (multiple)** | 163m<br>218m<br>113m | Mixed mature, with some regeneration<br>Established regeneration<br>Young pole, immature |
| **Nearly-native woodland** | 30m<br>60m | Young pole, immature<br>Young pole, immature |
| **Upland birchwood** | 64m | Established regeneration |
| **Ancient Woodland Inventory** | | |
| **Broadleaved woodland** | 230m | Ancient (of semi-natural origin): 2a |

[20] https://sitelink.nature.scot/site/1642

| Site of Interest | Distance from site (approx.) | Description/Qualifying Features of Interest only |
|---|---|---|
| **Mainly Conifer** | 54m<br>0m (within working area) | LEPO:2b Mainly Conifer<br>LEPO:2b |
| **Local Nature Conservation Sites** | | |
| **Rattray Head to Peterhead LNCS** | Within 250m ESA | Variety of coastal habitats including sand dunes. Good diversity of plant species including several species that are rare in NE Scotland. Adjacent fields important for roosting and feeding geese, waders and wildfowl. |
| **Rora Moss LNCS** | 1.3km | Lowland raised bog with acid grassland, ponds and rush pasture. Good variety of peatland species. The southern part of the site is commercial forestry with bog habitat in the unplanted areas. |
| **Skelmuir Hill, Stirling Hill, Dudwick LNCS** | 1.6km | Preglacial Buchan Gravels Formation, which is rich in flints, blankets the ridge of Stirling Hill, Hill of Dudwick and Skelmiur Hill. Den of Boddam glacial meltwater channel. |

***Other Notable Sites***

Other notable sites out with the 5 km buffer include the following:

- Buchan Ness to Collieston SAC[21] designated for their vegetated sea cliffs.
- Buchan Ness to Collieston Coast SPA[22] , designated for breeding birds.
- Southern Trench MPA(NC)[23] designated for marine features such as Minke whale, sediment, geology and geomorphology.

[21] https://sitelink.nature.scot/site/8214
[22] https://sitelink.nature.scot/site/8473
[23] https://sitelink.nature.scot/site/10477

## 3.2 Carbon & Soil Profile

### 3.2.1 Overview

Scotland's soils are an important natural resource providing a range of benefits for the environment with a wide range of essential functions, such as controlling the quality and quantity of water flow, supporting valuable habitats and species, and storing carbon. They are included within the NPF4 under Policy 5: Soils. Understanding the geology and the soil enables better understanding of the habitats that the soil supports and the water flow through of the soil. This information can assist in determining protection of sensitive habitats, enabling biodiversity enhancement and mitigation strategies.

### 3.2.2 Geology

The British Geological Society's[24] (BGS) map data was consulted to inform the bedrock and sediment properties, such as the possible location of peat and carbon concentration within the survey area. The main underlying bedrock groups in the study area comprise of the following:

- Igneous bedrock: Peterhead Pluton - Granite.
- Igneous bedrock: Forest of Deer Pluton - Melagranite, biotite.
- Igneous bedrock: Maud Pluton - Gabbroic-rock.
- Metamorphic bedrock: Crinan Subgroup and Tayvallich Subgroup - Semipelite, pelite and psammite.
- Metamorphic bedrock: Macduff Formation - Micaceous psammite, semipelite and pelite

The superficial deposits in this area consist of sedimentary superficial deposits of Glaciofluvial Sheet Deposits of gravel, sand and silt, areas of peat, Banchory Till Formation – Diamicton, and around the river bed alluvium - clay, silt, sand and gravel.

### 3.2.3 Soil Profile

The Scotland Soil Maps[25], UK Soil Observatory Map viewer[26] and the National Soil Map Scotland[27] were consulted to determine the type of soil present and their level of Carbon and water holding capacity. Carbon and Peatland map[28] illustrates the distribution of carbon and peatland classes within Scotland and the map was consulted to determine likely peatland classes present within the Site. The map provides a consolidated spatial

[24] British Geological Society (BGS); https://www.bgs.ac.uk/
[25] Scotland's Environment, Scotland's Soil; https://www.environment.gov.scot/
[26] https://mapapps2.bgs.ac.uk/ukso/home.html
[27] Scotland's Environment, National Soil Map of Scotland and NSIS https://map.environment.gov.scot/sewebmap/
[28] Scotland's Environment, Scotland's Soil; https://map.environment.gov.scot/Soil_maps/?layer=10

dataset which combines historical soil information with land cover data. The map also illustrates where there are areas of peat, if any, and identifies areas as mostly mineral soils with pockets of carbon-rich soil, peat and peatland habitat. The data on peat locations mainly correlates with that from the British Geological Society map data and the combined data indicates that the Site consists mainly of Class 0 soils (mineral soil with no peatland vegetation) with occasional pockets of Class 1, Class 5 and a few Class 4 categories.

- Class 0: This soil type is a mineral soil and forms the main component of the soil type along the Proposed Development. The habitats are mainly improved grassland and arable crop fields, with some woodland.
- Class 1: This soil type is a nationally important carbon-rich soil of deep peat and priority peatland habitat and has high conservation value. The Proposed Development footprint avoids areas of Class 1 peat soil, although some pockets are located on the edge and within the ESA (Table 4 and Figure 5 – Maps 1 to 3).
- Class 4: The area and its soil are unlikely to be associated with peatland habitats or wet and acidic type and is unlikely to include carbon-rich soils. The habitat in these areas consists mainly of improved grassland vegetation and arable fields.
- Class 5: In the areas where the Class 5 is present the soil information takes precedence over vegetation data and is in an area where no peatland habitat is recorded. The soil tends to be carbon-rich and may have areas of deep peat. The Proposed Development passes through some areas of Class 5 soils (Table 4 and Figure 5 – Maps 1 to 3).

Table 4 lists the locations of the Class 1 and Class 5 soils in relation to their location within the ESA, with a few being located through the centreline and the Cable Route Corridor (TN_PC02, TN_PC05 and TN_PC07), all of which are Class 5 soils with no peatland vegetation. Figure 5 illustrates the location of where there are Class 1 and Class 5 soils within the ESA. The wider area has pockets of dystrophic blanket and basin peat.

The available water capacity of the soil ranges from very low at 84.73mm, and mostly at the medium range up to 171.03mm over mineral soil. This is in the low to mid-value range, with low values indicative of a water deficiency, and high values indicating a potential water excess. The topsoil organic carbon concentration ranges from 2.58% to 4.92%.

**Table 4: Target Note for Peat Class 1 and 5 within the ESA (see Figure 5 – Maps 1 to 3).**

| Target Note | Grid Reference | Peat Class and Location Description | Phase 1 Code | Habitat Description |
|---|---|---|---|---|
| TN_PC01 | NJ 82754 44565 | Class 5 near substation, not within Cable Route Corridor. Two habitat types within this section. | B2.2 | Modified grassland with patches of *Juncus effusus* |
| | | | B4 | Modified grassland |
| TN_PC02 | NJ 85287 45681 | Class 5 within centreline and Cable Route Corridor | J1.1 | *Arable crop* |
| TN_PC03 | NJ 89596 44973 | Class 5 not within corridor, at outer edge of ESA. Two habitat types within this section. | B2.2 | *Juncus effusus* dominant grassland field |
| | | | B4 | Modified grassland with occasional patches of *Juncus effusus* |
| TN_PC04 | NJ 89942 45486 | Class 1 not within Cable Route Corridor . Two habitat types within this section. | E1.7 | Degraded blanket bog with peatland vegetation (mosaic). |
| | | | C3.1 | Consists of ruderals, gorse scrub, small trees, and a marshy grassland mosaic, and does not present as Class 1, but as Class 5.<br>This habitat polygon extends over a Class 1 & Class 5 soil classification. |
| TN_PC05 | NJ 90037 45162 | Class 5 within Cable Route Corridor and centreline.<br>Two habitat types within this section. | B4 | Modified grassland field with wetter sections and *Juncus effusus* |
| | | | B2.2 | *Juncus effusus* dominant grassland field. Part of B2.2 not within Cable Route Corridor . |
| TN_PC06 | NJ 91645 45243 | Class 1 not within Cable Route Corridor, at outer edge of ESA.<br>Two habitat types within this section. | B5 | Degraded blanket bog with peatland vegetation (mosaic). Mostly *Juncus effusus, Molinia caerulea* dominant. |
| | | | A1.2.2 | Conifer plantation 1 Blanket bog/peat. veg |
| TN_PC07 | NK 03672 48858 | Class 5 within Cable Route Corridor and centreline | B4 | Modified grassland |
| TN_PC08 | NK 04341 48609 | Class 5 not within Cable Route Corridor, at outer edge of ESA (adjacent to Class 1) | J1.1 | Arable crop |

### 3.2.4 Hydrogeology

According to the BGS and the Hydrogeological and Groundwater Vulnerability Maps of Scotland[29], there is one type of low productivity aquifer associated with the underlying bedrock where the groundwater flow mechanism is mainly through fractures and other discontinuities.

SEPA have classified the quality of all groundwater bodies in Scotland under the Water Framework Directive (WFD)[30]. This map informs that the majority of the study area is located upon the Mintlaw groundwater unit, with the most easternly region sited on the Fraserburgh unit, and the most westerly area situated on the Ellon unit.

SEPA have classified both the Mintlaw (ID: 150655) and Fraserburgh (ID: 150634) groundwater units as having an overall status of "Good" in 2020 with no limiting parameters. However, the Ellon unit (ID: 150676), which surrounds the proposed substation at New Deer, was classified as having an overall status of "Poor" due to its chemical status.

The farmland area contains a number of drains and ditches throughout, mostly situated along field and main road boundaries. There are water wells and small un-named and minor watercourses within the ESA. The hydrogeology formation impacts the type of habitats and botanical communities present, and this data is considered when surveying within the ESA. Table 5 lists the main named and major watercourses within the ESA that have been classified by SEPA in 2020.

**Table 5: The main rivers within the ESA that have been classified by SEPA in 2020.**

| Name of Watercourse | Ecological Status (SEPA, 2020) | Catchment |
|---|---|---|
| River Ugie | Poor | River Ugie |
| North Ugie Water | Moderate - Poor | River Ugie |
| South Ugie Water | Moderate - Poor | River Ugie |
| Burn of Faichfield | Moderate | River Ugie |
| Quhomery Burn | Moderate | River Ugie |
| Ebrie Burn | Poor | River Ythan |
| Annochie Burn | Unclassified | River Ythan |
| Burn of Stonehouse | Good | River Ythan |
| Burn of Aslied | Unclassified | River Ythan |

[29] British Geological Survey 1:50,000 Digital Map. Available online: https://www.bgs.ac.uk/data/mapViewers/home.html

[30] SEPA Water Classification Hub. https://www.sepa.org.uk/data-visualisation/water-classification-hub/

| Name of Watercourse | Ecological Status (SEPA, 2020) | Catchment |
|---|---|---|
| Little Water/ Black Burn | Moderate | River Ythan |

## 3.3 Description of Habitat Types, NVC Communities and Evaluation

### 3.3.1 Phase 1 Overview

A total of thirty-five Phase One habitats were recorded on Site, including buildings, fences and walls. Table 6 lists the broader habitat types of the Phase One habitat found in this survey. Table 7 displays the main list of Phase 1 Habitats mapped and the total estimated area of each habitat type found within the main Ecological Survey Area (ESA). The ESA covers an area of 2205.18 hectares (ha) which comprises a corridor of approximately 550m to 700m wide and approximately 35km long from east to west.

The Phase One map for the Proposed Development within a 250m ESA is illustrated in Figure 6: Maps 1 - 16.

**Table 6: Phase 1 types recorded within the ESA.**

| Phase 1 Code | Description |
|---|---|
| **Woodlands and Scrub** | |
| A1.1.1 | Woodland Broadleaved: semi-natural (some AWI/NSSI) |
| A1.1.2 | Woodland Broadleaved: plantation |
| A1.2.2 | Woodland Coniferous: plantation |
| A1.3.1 | Woodland Mixed: semi-natural (some AWI/NSSI) |
| A1.3.2 | Woodland Mixed: plantation |
| A2.1 | Scrub: Dense/continuous |
| A2.2 | Scrub: Dense/scattered |
| A3.1 | Parkland/Scattered trees: broadleaved |
| A3.2 | Parkland/Scattered trees: conifers |
| A3.3 | Parkland/Scattered trees: mixed |
| **Grassland and Marsh** | |
| B2.2 | Neutral grassland: semi-improved |
| B4 | Improved grassland |
| B5 | Marsh/marshy grassland |
| B6 | Poor semi-improved grassland |
| **Tall Herb and Fern** | |
| C3.1 | Tall herb and Fen: tall ruderal |
| **Mire** | |
| E1.7 | Mire: Wet Modified Bog |
| **Swamp, Marginal and Inundation** | |
| F1 | Swamp |

| Phase 1 Code | Description |
|---|---|
| F2.2 | Swamp: Marginal and Inundation |
| **Open Water** | |
| G1 | Standing water |
| G2 | Running water & ditch systems |
| **Coastland** | |
| H1.1 | Coastland Intertidal: sand |
| H6.5 | Sand dune: grassland |
| **Rock Exposure & Waste: Artificial** | |
| I2.1 | Quarry |
| **Miscellaneous** | |
| J1.1 | Cultivated/disturbed land: arable |
| J1.2 | Cultivated/disturbed land: amenity |
| J2.1.1 | Intact hedge: species rich |
| J2.1.2 | Intact hedge: species poor |
| J2.2.2 | Defunct hedge: species poor |
| J2.3.1 | Hedge and trees: native species rich |
| J2.3.2 | Hedge and trees: species poor |
| J2.4 | Fence |
| J2.5 | Stone wall |
| J3 | Built area/hardstanding |
| J3.6 | Buildings |
| J4 | Bare ground |

**Table 7: Phase One Habitats mapped and their total estimated area within the Study Area.**

| Phase 1 habitat | Area (ha) | % of Habitat in ESA |
|---|---|---|
| **A1.1.1** | 16.46 | 0.75 |
| **A1.1.2** | 11.34 | 0.51 |
| **A1.2.2** | 30.14 | 1.37 |
| **A1.3.1** | 2.84 | 0.13 |
| **A1.3.2** | 10.88 | 0.49 |
| **A2.1** | 5.88 | 0.27 |
| **A2.2** | 7.72 | 0.35 |
| **A3.1** | 6.25 | 0.28 |
| **A3.2** | 0.28 | 0.01 |
| **A3.3** | 0.81 | 0.04 |
| **B2.2** | 93.29 | 4.23 |
| **B4** | 676.32 | 30.67 |
| **B5** | 33.02 | 1.5 |
| **C3.1** | 11.77 | 0.53 |
| **E1.7** | 1.03 | 0.05 |
| **F1** | 0.88 | 0.04 |
| **F2.2** | 0.3 | 0.01 |
| **G1** | 3.12 | 0.14 |
| **G2** | 0 | 0 |
| **H1.1** | 1.24 | 0.06 |

| Phase 1 habitat | Area (ha) | % of Habitat in ESA |
|---|---|---|
| **H6.5** | 8.5 | 0.39 |
| **I2.1** | 5.58 | 0.25 |
| **J1.1** | 1176.33 | 53.34 |
| **J1.2** | 17.32 | 0.79 |
| **Other habitats*** | 83.87 | 3.8 |
| **Total** | 2205.18 | **100** |

***hedges, tree lines, ditches, watercourses, residential & farm buildings, hardstanding, tracks and roads etc.

### 3.3.2 NVC Classification Overview

A total of twenty-six NVC vegetation types, with non-NVC types such as arable and plantation (Conifer, Broadleaved and Mixed woodland), (Figure 7: Maps 1 - 16), were located in this survey, these National Vegetation Communities are listed in Table 8 and described in the following pages.

**Table 8: National Vegetation Classification types recorded within the ESA.**

| NVC Code | Community/Sub-community name |
|---|---|
| **Woodlands and Scrub** | |
| W4 | *Betula pubescens-Molinia caerulea* woodland |
| W7 | *Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland |
| W9 | *Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis* woodland |
| W11 | *Quercus petraea – Betula pubescens – Oxalis acetosella* woodland |
| W23 | *Ulex europaeus-Rubus fruticosus* scrub |
| **Mires** | |
| M18 | *Erica tetralix-Sphagnum papillosum* raised and blanket mire |
| M20a | *Eriophorum vaginatum blanket and raised* mire*:* |
| M23 | *Juncus effusus/acutiflorus – Galium palustre* rush-pasture *Juncus effusus* sub-community |
| M25 | *Molinia caerulea-Potentilla erecta* mire |
| M27 | *Filipendula ulmaria-Angelica sylvestris* tall-herb fen |
| **Mesotrophic Grassland** | |
| MG5 | *Cynosurus cristatus-Centaurea nigra* grassland |
| MG6 | *Lolium perenne-Cynosurus cristatus* grassland |
| MG7 | *Lolium perenne* leys and related grassland |
| MG10a | *Holcus lanatus-Juncus effusus* rush-pasture, typical sub-community |
| **Open Vegetation** | |
| OV21 | *Poa annua – Plantago major* community |
| OV22 | *Poa annua-Taraxacum officinale* community |
| OV25 | *Urtica dioica-Cirsium arvense* community |
| OV27 | *Chamerion angustifolium community* |
| **Swamps and Fens** | |
| S5 | *Glyceria maxima* swamp |
| S9 | *Carex rostrata* swamp |
| S28 | *Phalaris arundinacea tall-herb* fen |
| **Sand Dune** | |

| NVC Code | Community/Sub-community name |
|---|---|
| SD5b | *Leymus arenarius mobile dune community, Elymus farctus* sub-community |
| SD6a | *Ammophila arenaria mobile dune community, Elymus farctus* sub-community |
| SD6e | *Ammophila arenaria mobile dune community, Festuca rubra* sub-community |
| SD8a | *Festuca rubra-Galium verum fixed dune grassland, typical* sub-community |
| SD9a | *Ammophila arenaria-Arrhenatherum elatius dune grassland, typical* sub-community |
| **Non NVC types** | |
| C | Non NVC type - Crop/Arable |
| MP | Non NVC type - Mixed Plantation |
| BP | Non NVC type - Broadleaved Plantation |
| CP | Non NVC type - Coniferous Plantation |
| Other | Non-NVC type (watercourses, ditches, stone walls, fences & tracks, buildings and quarries) |

### 3.3.3 Habitat Descriptions

#### *3.3.3.1 Woodlands and Scrub*

There are multiple woodland habitat types found within the ESA. Broadleaved woodland is frequent throughout and consists of stands of beech (*Fagus sylvatica*), ash (*Fraxinus excelsior*), downy birch (*Betula pubescens*), silver birch (*Betula pendula*), common alder (*Alnus glutinosa*), pedunculate oak (*Quercus robur*), common hawthorn (*Crataegus monogyna*), bay willow (*Salix pentandra*), grey willow, (*Salix cinerea*), sycamore (*Acer pseudoplatanus*) and rowan (*Sorbus aucuparia*). Broadleaved trees are also located along field edges, watercourses, in residential gardens and can form scattered lines or are mixed with hedge habitat (Figure 9). Some of these woodlands are listed on the Ancient Woodland Inventory and findings were as follows:

- Crichie Wood (AWI: LEPO 2b) consists of mainly conifer plantation with broadleaved trees along the southern edge and regeneration occurring within the woodland. This woodland is approximately 67m north of the Cable Route Corridor.
- The Cable Route Corridor is proposed through a narrow belt of broadleaved trees listed as AWI: LEPO 2b (New Deer) at approx. NJ 90537 44968. This woodland is adjacent to the junction of A948 and B9106 roads. The method proposed is trenchless for the cable to be taken under the woodland and road junction. Tree root protection zones will be implemented to ensure that this AWI will not be impacted by the Proposed Development. Mitigation will also follow the guidance for buffer zone recommendations for ancient woodland (UK Gov, 2022[31]).

[31] https://www.gov.uk/guidance/ancient-woodland-ancient-trees-and-veteran-trees-advice-for-making-planning-decisions#ancient-woodland

- No other woodland designated on the AWI encroaches within the Cable Route Corridor or ESA.

Some of these woodlands are listed on the Native Woodland Survey Scotland (NWSS) and findings were as follows;

- A wet woodland (NJ 99190 43847) listed on the Native Woodland Survey of Scotland (NWSS) is approximately 45 meters south from the Cable Route Corridor. There will be no land take from this woodland, however due to its proximity mitigation is proposed such as the inclusion of Tree Root Protection Zones. This wet woodland is adjacent to a large pond.
- The Cable Route Corridor is 8m south of a wet woodland in the NWSS list (NJ 92897 44302). The Application Site Boundary follows the woodlands southern edge. There will be no land take from this woodland, however due to its proximity mitigation is proposed such as the inclusion of Tree Root Protection Zones.

The Cable Route Corridor is proposed through a wide section of conifer plantation (approx. NJ 91596 44966) and through a strip of broadleaved trees (approx. NJ 91093 44917). Mitigation is proposed such as the inclusion of Tree Root Protection Zones.

There are multiple scattered and dense scrub communities throughout the ESA which are dominated by European gorse (*Ulex europeaus*) (Figure 10). They are located along ditch and field margins, and in dense patches in unmanaged grassland areas. The majority of these scrub areas are homogenous stands of gorse, with occasional broom (*Cytisus scoparius*) and bramble (*Rubus fruticosus*).

The W4 and W7 woodland are close fits to the wet woodland classification and lack the full number of floristics. This may be due to the small size of the woodlands and drainage management. They grade with W11 classification in woodlands located at NJ 99190 43847 and NJ 92897 44302. W9 is located at NJ 89809 45050.

#### *3.3.3.2 Mires*

Wet modified bog was present within the ESA in small discrete patches historically associated with bog habitat. This habitat was recorded within an open area of a conifer plantation (NJ 91626 45262), but was highly modified and reflected a dominant M25, where the ground was drier and more drained, with less floristic association with M18. This habitat was considered to have been heavily modified because of existing forestry works, grazing from deer and the creation of drainage ditches.

This habitat was also located at NJ 89942 45486 that resembled a modified M18 and M20a and had a small patch of willow scrub in the wetter section. This habitat was

considered to have been heavily modified as a result of the creation of drainage ditches and soil improvement practices for grazing.

#### *3.3.3.3 Grassland and Marsh*

There were several different grassland communities recorded during the survey. The main grassland communities include MG6 *Lolium perenne-Cynosurus cristatus* grassland and MG7 *Lolium perenne* leys and related grassland and are a result of agricultural improvement on the land. This improved grassland is present throughout the length of the ESA (Figure 11). Some of these grassland fields are damp or strongly impeded drainage and have areas of scattered soft rush (*Juncus effusus*). Fields that are more waterlogged have a denser rush-pasture community recorded. NVC communities associated with this type of habitat are MG10a (Figure 12). Although found on various soil types including brown earth and calcareous earth throughout its range, this habitat can also have close associations with various types of mire vegetation and can form significant parts of rush-dominated mire mosaics in areas of suitably moist soils. Growing through the tussocks there is usually and typically variable amounts of *Holcus lanatus, Agrostis spp., Ranunculus repens, Rumex acetos*a and *Trifolium repens*. More occasional and only in some stands there were additional floristics of *Senecio jacobaea, Cirsium arvense, Cirsium palustre, Rumex obtusifolius, Equisetum arvense, Cynosurus cristatus, Prunella vulgaris* and *Taraxacum officinale* agg.

The MG10a community is identified as being potentially moderately dependent on groundwater depending on their hydrogeological setting (SEPA, 2012). However, the distribution of MG10a communities were closely linked to the presence of impeded drainage and ditches suggesting surface water flow and seepage may be a stronger indicator of the habitat presence.

##### *3.3.3.3.1 Marshy Grassland*

These communities are recorded in areas that are seasonally or permanently wet along ditches, watercourses and ponds. Species such as soft rush (*Juncus effusus)* are dominant. NVC communities associated with this type of habitat are normally M23 *Juncus effusus/acutiflorus –Galium palustre* rush-pasture. M23 habitats are associated with wet ground with species including meadowsweet (*Filipendula ulmaria*) wild angelica (*Angelica sylvestris*), marsh violet (*Viola palustris*), marsh marigold (*Caltha palustris*), and marsh bedstraw (*Galium palustre*). But unlike M25 NVC communities where purple moor-grass is dominant, M23 habitats have sharp-flowered rush *Juncus acutifloris* or less often, soft rush being the most abundant species. The M23 rush pastures occur in stagnant waterlogged areas, with soils acid to neutral and are kept wet due to flushing and seepage

and some standing water. Within the ESA the M23 community occurs in poorly drained dips, gentle slopes and along stream margins, kept wet by seepage and flushing. The water table is at or above the surface with standing water a main feature of this community.

The M23 community was also located in areas that were very wet under foot with a high-water table (Figure 13). These pockets of marsh/marshy grassland were frequently recorded transitioning into fen or swamp habitats, mainly located near ponds, small and larger watercourses such as the North Ugie Water and in a wider wetland area near the South Ugie Water which was dominated by fen and swamp vegetation (in the wider vicinity of NK 01769 47195).

NVC M25 community is a habitat type associated on occasion with the marshy grassland habitat type, however it is also associated with degraded mire bog habitat (in the vicinity of open conifer plantation NJ 91626 45262 and at NJ 89927 45497). These areas are characterised by tussocks of purple moor-grass which can inhibit the growth of most other plant species. Species that are constant include tormentil (*Potentilla erecta*), cross-leaved heath (*Erica tetralix*) velvet bent (*Agrostis canina*), marsh violet, soft rush, sharp-flowered rush, common haircap (*Polytrichum commune*), common sedge (*Carex nigra*), deergrass (*Trichopherum germanicum*) and bog asphodel (*Narthecium ossifragum*). M25 within the ESA is situated in areas that are more open stands where purple moor-grass is slightly less dominant with a greater variety of species with cuckooflower (*Cardamine pratensis*), meadowsweet, marsh willowherb (*Epilobium palustre*).

These communities are identified as being potentially moderate to highly dependent on groundwater depending on their hydrogeological setting (SEPA, 2012). However, the distribution of M23 communities were closely linked to the presence of watercourses and drainage ditches suggesting surface water flow and seepage may be a stronger indicator of the habitat presence.

*3.3.3.3.2 Neutral Grassland – semi-improved*

This variable habitat is widespread in its distribution throughout the survey area. This habitat was found where soils were somewhat more improved and contained species such as crested dog's tail, meadow foxtail (*Alopecurus pratensis*) and cock's foot (*Dactylis glomerata*). This habitat was frequently dominated by tufted hair-grass (*Deschampsia cespitosa*), soft-rush (*Juncus effusus*) with frequent false oat-grass (*Arrhenatherum elatius*), Yorkshire-fog (*Holcus lanatus*) and occasional sheep's sorrel and pignut. Perennial ryegrass may be present, but when found in abundance it is more of a sign of improved grassland. It was located along field margins, track edges,

watercourse banksides, open river grassland areas (with some MG5) and fields of dominant MG10a.

#### 3.3.3.4 *Open Vegetation*

This is a widespread habitat throughout the ESA mainly located on disturbed ground, along field margins and watercourses in small pockets. Rosebay willowherb (*Chamerion angustifolium*) is a dominant species (OV27), along with the *Urtica dioica-Cirsium arvense* community (OV25) vegetation community within the survey area (Figure 14). The community is dominated by the two constants: common nettle (*Urtica dioica*) and field thistle (*Cirsium arvense*).

#### 3.3.3.5 *Swamps and Fens*

Swamp habitat was recorded in isolated pockets of the ESA often associated with watercourse margins and ponds. Species composition included water horsetail (*Equisetum fluviatile*), bottle sedge (*Carex rostrata*), reed canary grass (*Phalaris arundinacea*) and branched bur-reed (*Sparganium erectum*). A wider expanse of swamp and fen was located at the South Ugie Water, where there were impassable swamp areas which are associated with previous ponds and river meanderings.

The NVC community S5 *Glyceria maxima* swamp is dominated by reed sweet-grass (*Glyceria maxima*) and is an emergent swamp community forming dense stands. However, reed sweet-grass was also located as smaller patches along the margins of ditches and rivers. The S9 *Carex rostrata* swamp community is dominated by bottle sedge (*Carex rostrata*) and occurs around the margins of mostly mesotrophic standing water and it may also be found in poor fens.

The S28 *Phalaris arundinacea* tall-herb fen, where reed canary-grass (*Phalaris arundinacea*) is a constant, and is typical of the margins of fluctuating, circumneutral and mesotrophic to eutrophic waters, both standing and running. Although it can be found on organic soils, it is more characteristic of mineral substrates, from fine clays to coarse gravels. It is common in open-water transitions around ponds and lakes of all sizes and also occurs around reservoirs, flooded clay and gravel pits, in some flood-plain and basin mires. It is widespread, too, along periodically flooded ditches and by rivers. The geology and soils of the River Ugie catchments strongly influences the chemical properties of the water supply and creates a range of variation in fen vegetation, in particular within a wider swamp and fen vegetated area of the South Ugie Water.

#### 3.3.3.5.1 *Marginal and inundated*

Marginal habitats were frequently recorded along the banks of watercourses within the ESA. In accordance with JNCC guidance, areas of swamp narrower than 5 m and bordering a watercourse were classified as marginal vegetation. Species composition generally resembled that of swamp, dominated by bottle sedge with occasional branched bur-reed, reed canary grass and yellow flag-iris.

### 3.3.3.6 *Sand Dune*

Sand and sand dunes system habitats are located at the eastern section of the ESA and at the proposed Landfall for the cable connection corridor. Much of these sand dune habitats are characteristically mobile, such as, SD5b, SD6a & SD6e. SD5b consists of blue lyme grass (*Leymus arenarius*) and is a foredune community. SD6a & SD6e are communities of marram dune systems found between embryonic dunes to the seaward and fixed dunes to the landward.

The SD9a is part of the fixed dune vegetation communities which occurs mainly on large dune systems, with the width to allow this habitat to develop. It typically occurs inland of the zone dominated by marram grass (*Ammophila arenaria*) on coastal dunes and represents the vegetation that replaces marram as the dune stabilises and the organic content of the sand increase. The SD9a community is located in a strand between the mobile dune systems of SD5b, SD6a & SD6e and the more landward fixed SD8a dune system.

SD8a is the *Festuca rubra-Galium verum* community that consists of dune vegetation in which Festuca rubra and a variety of other grasses, dicotyledons and mosses make up a generally closed short sward, and sometimes closely cropped to a short, tussocky turf. Marram grass (*Ammophila arenaria*) remains common overall, but it is no longer a constant feature of the vegetation (as with SD9a) and is only occasional. Red fescue (*Festuca rubra*), is abundant, and is the typical dominant species in the sward. There is a gold course on the landward side of the dunes with MG7 grassland.

## 3.3.4 **Ponds**

There are multiple ponds within the ESA, some of which are associated with the main watercourses, and some are small scrapes or seasonal ponds. The vegetation in and around the ponds varied to include vegetation such as *Phalaris arundinacea, Filipendula ulmaria, Caltha palustris, Rumex acetosa, Galium palustre, Cirsium arvense, Urtica dioica, Glyceria maxima, Carex rostrata*, *Juncus effusus*, *Holcus lanatus, Ranunculus repens* and *Mentha aquatica*.

### 3.3.5 Non NVC type - Plantations

There are multiple plantations along the ESA many of which are identified within the National Forest Inventory Woodland Scotland 2020[32] and consist of broadleaved, coniferous and mixed plantations.

### 3.3.6 Non NVC type - Quarry

There are four quarries within the ESA, and all are of a small size, with two being active, one of which is in the vicinity of the Cable Route Corridor (NK 05253 48809). The other smaller quarries are disused and overgrown with ruderals and scrub.

### 3.3.7 Non-NVC type - Other

The watercourses, ditches, stone walls, fences and tracks are classed as Non-NVC types. The cable is proposed to cross over the major watercourses with the use of trenchless methods, two crossing points are illustrated in Figures 15 and 16. Figure 17 illustrates a typical watercourse (the Burn of Aesleid) which has been straightened along a field perimeter.

## 3.4 Invasive Species

Invasive plant species were noted within the ESA and included Indian balsam (*Impatiens glandulifera*) which was located in multiple areas, mostly along ditches and watercourses such as the River Ugie, North and South Ugie Water, Quhomery Burn and along ditches. Japanese knotweed (*Fallopia japonica*) was listed within the NESBReC data supplied, with occurrences outwith the ESA. No giant hogweed was noted.

## 3.5 Notable Species

NESBRec data included incidences of locally important plant species such as small-flowered crane's-bill (*Geranium pusillum*) and three incidences of marsh yellow-cress (*Rorippa palustris*).

[32] https://data-forestry.opendata.arcgis.com/datasets/eb05bd0be3b449459b9ad0692a8fc203_0/explore

# 4 EVALUATION OF BOTANICAL INTEREST

## 4.1 Evaluation Criteria

NVC communities can be compared with a number of additional habitat classifications in order to assist in the assessment of the sensitivity and conservation interest of certain areas. The NVC communities identified can be compared against the following three classifications:

- SEPA guidance on Groundwater Dependent Terrestrial Ecosystems (GWDTEs) (SEPA 2017a; 2017b);
- Habitats Directive (92/43/EEC)[33] Annex I habitats;
- Scottish Biodiversity List (SBL)[34] priority habitats.

## 4.2 Habitats classed by SEPA as Groundwater Dependent Terrestrial Ecosystems

SEPA has classified several NVC communities as potentially dependent on groundwater (SEPA, 2017a & 2017b). Wetlands or habitats containing these NVC communities are to be considered GWDTE unless further information can be provided to demonstrate this is not the case.

Many of the NVC communities on the list are very common habitat types across lowland Scotland, and some are otherwise generally of low ecological value. Furthermore, some of the NVC communities may be considered GWDTE only in certain hydrogeological settings. Designation as a potential GWDTE does not therefore infer an intrinsic biodiversity value, and GWDTE status has not been used as criteria to determine a habitats respective conservation importance. There is however a statutory requirement to consider GWDTEs and the data gathered during the NVC surveys has been used to inform this assessment.

This report details the results of the NVC vegetation communities to determine the potential level of groundwater dependency. Determining groundwater dependency is complex as most water-dependent terrestrial ecosystems rely on a combination of groundwater, surface water and rainwater, and many vegetation communities will use the available source of water. In some topographical and hydrogeological conditions, a

[33] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. https://www.legislation.gov.uk/eudr/1992/43/annex/I
[34] https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list

particular ecosystem can be groundwater-dependent whereas in others the same ecosystem is surface water dependent.

To add to this complexity the seasonal patterns of water availability impact water use, where groundwater reliance can be greater in the summer when rainfall and surface water are less available.

Among the habitats found in this survey, the following are classed by the Scottish Environmental Protection Agency (SEPA, 2017a; 2017b) as Groundwater Dependent Terrestrial Ecosystems (GWDTE) (Table 9).

**Table 9: NVC communities and their GWDTE score (1= Strong dependency upon groundwater, 2= likely to be some dependency, 3= slight or no dependency)**

| NVC Community | GWDTE score (1, 2, or 3) |
|---|---|
| W4 *Betula pubescens-Molinia caerulea* woodland | 1 |
| W7 *Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland | 1 |
| M23 Juncus effusus/acutiflorus – Galium palustre rush-pasture Juncus effusus sub-community | 2*∞ |
| M27 *Filipendula ulmaria-Angelica sylvestris* tall-herb fen | 2 |
| MG10a *Holcus lanatus-Juncus effusus* rush-pasture, typical sub-community | 2*∞ |
| MG5 *Cynosurus cristatus-Centaurea nigra* grassland | 3 |
| M25 *Molinia caerulea-Potentilla erecta* mire | 3 |
| M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire | 3 |
| M20a *Eriophorum vaginatum blanket and raised* mire | 3 |
| S5 *Glyceria maxima* swamp | 3 |
| S9 *Carex rostrata* swamp | 3 |
| S28 *Phalaris arundinacea tall-herb* fen | 3 |
| * GWDTE Score Scotland or may vary for different hydroecological settings<br>∞ Country Occurrence: Scotland only – Not in England & Wales<br>*Explanation of GWDTE scores:*<br>*1 – Strong dependency upon groundwater discharge (Highly).*<br>*2 – Likely to be some dependency on groundwater discharge (Moderate).*<br>*3 – Groundwater discharge usually irrelevant: site fed by other water sources.* | |

It is important to note that the GWDTE classification system above uses the data for the Scotland (GW) Dependency Score (UKTAG Guidance 5ab Annex 1)[35] or where it may vary for different hydroecological conditions as noted by * in brackets, and by ∞ as per country occurrence for GWDTE classification.

[35] UKTAG Guidance 5ab Annex 1, http://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/UKTAG%20guidance%205%20ab%20ANNEX%201%20updated%205%20October%202009.pdf

Using SEPA's guidance the habitats are colour-coded according to their dependency to groundwater, as illustrated in Figure 8: Maps 1-4 and Table 9 & 10. The NVC communities recorded that are likely to be considered moderate GWDTE in certain hydrogeological settings are highlighted in yellow. Those with slight or non-dependency are clear of shading.

### 4.2.1 Annex 1 Habitats

The Joint Nature Conservation Committee (JNCC) Annex I Habitat listings and descriptions[36], have been used to compare with the survey results and field observations. A number of UKHab and NVC communities can correlate to the various Annex I habitat types. However, the fact that an NVC community can be attributed to an Annex I type does not necessarily mean all instances of that NVC community constitutes an Annex I Habitat. Its Annex I status can depend on various factors such as quality, extent, species assemblages, geographical setting, substrates and so on.

The following NVC communities within the study area which constitute Annex I Habitats are summarised in Table 10. The NVC communities/sub-communities that correlates with Annex I types H7130, H91A0[37], H2110[38], H2120[39] and H2130[40] are discussed below.

#### *4.2.1.1 H7130 Blanket Bog*

The blanketing of the ground with a variable depth of peat gives this habitat type its name and results in the various morphological types according to their topographical position. Blanket bogs show a complex pattern of variation related to climatic factors, particularly illustrated by the variety of patterning of the bog surface in different parts of the UK. Such climatic factors also influence the floristic composition of bog vegetation.

Active bogs are defined as supporting a significant area of vegetation that is normally peat-forming. Typical species include the important peat-forming species, such as *Sphagnum* spp. and *Eriophorum* spp., or *Molinia caerulea* in certain circumstances, together with *Calluna vulgaris* and other ericaceous species. The most abundant NVC blanket bog types are M17, M18, M19, M20 and M25 where these form part of a larger blanket mire.

The Annex I type H7130[41] Blanket bog does not correlate directly with the NVC communities within the study area, such as M18, M20a and M25. These NVC

[36] https://sac.jncc.gov.uk/habitat/
[37] https://sac.jncc.gov.uk/habitat/H91A0/
[38] https://sac.jncc.gov.uk/habitat/H2110/
[39] https://sac.jncc.gov.uk/habitat/H2120/
[40] https://sac.jncc.gov.uk/habitat/H2130/
[41] https://sac.jncc.gov.uk/habitat/H7130/

communities within the study area are considered to have been heavily modified because of existing forestry works, grazing from deer and the creation of drainage ditches. The Annex I type H7130 Blanket Bog does not fully correlate directly with the NVC community within the study area.

#### *4.2.1.2 H91A0 Old sessile oak woods with Ilex and Blechnum*

The Annex I type H91A0 Old sessile oak woods with *Ilex* and *Blechnum* comprises a range of woodland types dominated by mixtures of oak (*Quercus robur* and/or *Q. petraea*) and birch (*Betula pendula* and/or *B. pubescens*). It is characteristic of base-poor soils in areas of at least moderately high rainfall in northern and western parts of the UK.

The habitat corresponds broadly to the 'western oakwoods' described in previous accounts of UK woodlands, particularly NVC types: W10e, W11, W16b, and W17.

There is considerable variation across its range, in terms of the associated ground flora and the richness of bryophyte communities. There is also a continuous spectrum of variation between oak-dominated and birch-dominated stands. Often these local variations reflect factors such as rainfall, slope, aspect, soil depth, and past and present woodland management (e.g. coppicing, planting, grazing). The most distinctive forms of the habitat have a ground flora dominated by bryophytes, such as *Dicranum majus, Hylocomium splendens, Isothecium myosuroides, Plagiothecium undulatum, Rhytidiadelphus loreus, Bazzania trilobata* and *Plagiochila spinulosa*. Other variants include stands in which the ground flora is characterised by the prominence of dwarf shrubs, such as bilberry (*Vaccinium myrtillus*); grasses, such as wavy hair-grass (*Deschampsia flexuosa*), common bent (*Agrostis capillaris*) and sweet vernal-grass (Anthoxanthum odoratum); and plants indicative of more mesophytic conditions, including bluebell (*Hyacinthoides non-scripta*), bramble (*Rubus fruticosus*), scaly male-fern (Dryopteris affinis).

#### *4.2.1.3 H2110 Embryonic shifting dunes*

Embryonic shifting dune vegetation exists in a highly dynamic state and is dependent on the continued operation of physical processes at the dune to beach interface. It is the first type of vegetation to colonise areas of incipient dune formation at the top of a beach. On a grading dune system this vegetation may be the precursor to the main dune-building vegetation dominated by marram (*Ammophila arenaria*). In most cases Embryonic shifting dunes are transient and will either be displaced by marram-dominated vegetation as the dunes develop, such as to the H2120 Annex 1 type, or will be washed away by storms. Therefore, the continued supply of new sand from the beach plain into the dune

system is therefore vital to the continued existence of this community, even if this sand is derived from within the same system. The habitat type is of exceptional importance as an indicator of the general structural and functional 'health' of a dune system. Creation of new dune habitat, and indeed the long-term survival of the dune system at which it occurs, is often dependent upon the survival of this habitat type.

In the UK most of the vegetation which conforms to this type belongs to NVC type SD4, SD2 and SD5 dune communities.

The Annex 1 type H2110 does correlate with that of the SD5 located within the ESA within the landfall vicinity.

#### 4.2.1.4 *H2120 Shifting dunes along the shoreline with Ammophila arenaria ('white dunes')*

The sand-binding marram *Ammophila arenaria* is always a prominent vegetation feature of the Annex 1 type H2120 and is usually dominant. In the UK the majority of such vegetation falls within NVC type SD6 *Ammophila arenaria* mobile dune community. This is a dynamic vegetation type maintained only by change. It can occur on both accreting and eroding dunes but will rapidly change and disappear if stability is imposed. It rarely occurs in isolation because of its dynamic nature and because it is successionally related to other dune habitats. The habitat type excludes the low, embryonic dunes where occasional exposure to saltwater flooding constrains the growth of marram and where plants of the strandline mingle with salt-tolerant, sand-binding grasses, such as, the Annex I type 2110 Embryonic shifting dunes.

The Annex 1 type H2120 does correlate with that of the SD6 located within the ESA within the landfall vicinity.

#### 4.2.1.5 *H2130 Fixed dunes with herbaceous vegetation ('grey dunes')*

This fixed dune vegetation occurs mainly on the largest dune systems, being those are wide enough to allow it to develop. It typically occurs inland of the zone dominated by marram *Ammophila arenaria* on coastal dunes and represents the vegetation that replaces marram as the dune stabilises and the organic content of the sand increases. In the UK the vegetation corresponds to the following NVC types: SD7, SD8, SD9b, SD11 and SD12.

The Annex 1 type H2130 does correlate with that of the SD8 and SD9 located within the ESA within the landfall vicinity.

### 4.2.2 Scottish Biodiversity List Priority Habitats

The Scottish Biodiversity List (SBL) is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. The SBL was published in 2005 to satisfy the requirement under Section 2(4) of The Nature Conservation (Scotland) Act 2004[42]. The SBL identifies habitats which are the highest priority for biodiversity conservation in Scotland: these are termed 'priority habitats'. Some of these priority habitats are quite broad and can correlate to a large number of NVC types.

The relevant SBL priority habitat types (full descriptions of which can be found on the NatureScot website[43]), are recorded within the study area (Table 10). These SBL priority habitats correspond with UK Biodiversity Action Plan (BAP) Priority Habitats[44].

### 4.2.3 Summary of Habitat Sensitivities

The NVC and habitat types, their associated habitat sensitivities as described above and their corresponding categories for the Scottish Biodiversity List are summarised in Table 10.

**Table 10: NVC types recorded at the Proposed site, with corresponding GWDTE designation, Scottish Biodiversity List and/or Annex 1 designations.**

| NVC | GWDTE | Scottish Biodiversity List | EU Habitats Directive Annex I habitat type |
|---|---|---|---|
| W4 | 1 | Wet woodland | N/A |
| W7 | 1 | Wet woodland | N/A |
| MG10a | 2 | | N/A |
| M23 | 2 | Upland flushes, fens, swamps (applies to M23a only) | N/A |
| M27 | 2 | | N/A |
| M25 | 3 | Lowland raised bog | Blanket bog (H7130) |
| M20a | 3 | Lowland raised bog | Blanket bog (H7130) |
| M18 | 3 | Lowland raised bog | Blanket bog (H7130) |
| S5 | 3 | Upland flushes, fens and swamps/ Lowland fens | N/A |
| S9 | 3 | Upland flushes, fens and swamps/ Lowland fens | N/A |
| W11 | 0 | Lowland mixed deciduous woodland | Old sessile oak woods with *Ilex* and *Blechnum* (H91A0) |
| SD5b | 0 | Coastal sand dunes | Embryonic shifting dunes (H2110) |
| SD6a,e | 0 | Coastal sand dunes | Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') (H2120) |
| SD8 | 0 | Coastal sand dunes | Fixed dunes with herbaceous vegetation ('grey dunes') (H2130) |

[42] https://www.legislation.gov.uk/asp/2004/6/contents
[43] https://www.nature.scot/landscapes-and-habitats/habitat-types/habitat-definitions
[44] https://jncc.gov.uk/our-work/uk-bap-priority-habitats/

| NVC | GWDTE | Scottish Biodiversity List | EU Habitats Directive Annex I habitat type |
|---|---|---|---|
| SD9 | 0 | Coastal sand dunes | Fixed dunes with herbaceous vegetation ('grey dunes') (H2130) |

### 4.2.4 Habitat Loss

The main habitat on Site is agricultural land which consists of arable crop land and modified grassland utilised for animal grazing. These are the main habitats that will be disturbed due to the Cable Route Corridor and infrastructure.

## 4.3 Evaluation & Discussion

### 4.3.1 NVC Evaluations

NVC and habitat surveys within the study area were undertaken to identify those areas of vegetation communities with the greatest ecological or conservation interest. The study area surveys covered the Proposed Development Site for the Green Volt Onshore infrastructure, including ecological survey areas (ESA) to 250m.

In total, twenty-six NVC communities were recorded within the respective study area. Non-NVC habitat types present included conifer, broadleaved and mixed plantations, watercourses, ditch systems, buildings, quarries, roads and tracks. The most common vegetation types within the study area (Tables 7 & 8) included arable crop land and modified grassland.

Much of the vegetation communities on Site have been impacted by farm practices and include grassland modification, drainage and grazing. These can also form transitional zones to other plant communities, especially where land has been unmanaged, or is adjacent to main watercourses.

There are no plant species from the habitats recorded on Site that are critically endangered, endangered or vulnerable on the IUCN Red list.

### 4.3.2 GWDTE Evaluations

The survey results have been compared to several sensitivity classifications, and Tables 9 & 10 summarises the presence or absence of Annex I, SBL and potential GWDTE habitats.

There are five communities categorised[45] as Class 3 GWDTE (M18, M20a, M25, S5 & S9). M25 is a community that can be a Class 2 under certain hydrogeological circumstances, however, the M25 is associated with bog mire communities which share the same hydrology sources.

There are three communities categorised as Class 2 GWDTE (MG10a, M23 & M27). M23 is mainly Class 2 but can be a Class 1 under certain hydrogeological circumstances, however, the M23 located within the ESA is associated mainly with seepage, drainage channels and surface water flow. The MG10a community is in multiple locations and mainly within modified grassland fields where drainage is impacted.

There are two Class 1 GWDTE (W4 & W7) which are highly dependent on groundwater sources. These woodlands have been classed as wet woodland on the NWSS inventory. One woodland is located (NJ 99190 43847) in wetter/damp soil adjacent to a pond. The other woodland is located at NJ 92874 44391 and is mostly a plantation woodland with an area of wetter ground where native regenerated birch and willow are present. This woodland is in proximity to the Cable Route Corridor.

Some parts of the areas identified as moderate groundwater-dependent (Class 2) habitats are on or near areas of Class 5 soil. In this classification the soil information takes precedence over vegetation data. Table 4 summarises the peat class, its location and the vegetation types. It can be assumed that the underlying substrate in these areas is peat under the present vegetation, and water flow through peat occurs at a slow rate.

Where there are moderate GWDTE located on non-peat soil classification there appears to be ponding in shallows and dips where water accumulates, leading to surface waterlogging. This can occur where the surface topography is typically almost flat with minor surface irregularities, which would tend to encourage ponding in the natural hollows.

## 4.4 Impact to Sensitive Habitats & Mitigation Considerations

### 4.4.1 Groundwater Dependent Terrestrial Ecosystems

Some of the moderate GWDTE habitat types (MG10a, M23 & M27) are in the form of mosaics with other habitats, such as MG6 and MG7 grasslands of which are not considered to be groundwater-dependent. It is likely that these Class 2 GWDTE's identified via NVC correlation cannot be fully described as groundwater-dependent as

45 UKTAG Guidance 5ab Annex 1, http://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/UKTAG%20guidance%205%20ab%20ANNEX%201%20updated%205%20October%202009.pdf

there is no reliably available source of groundwater on which they are able to depend. They are likely to rely on a combination of rainfall and surface runoff, with some direct surface water in areas adjacent to watercourses and waterbodies. Nevertheless, all of these habitats are considered to be sensitive, and a level of protection is required to minimise and, if necessary, mitigate any impacts that may occur. The above habitats that are located along ditch margins and seepage zones have not been included within the final GWDTE map

The wet woodland of W4 and W7 that have been categorized as Class 1 highly GWDTE are in two distinct habitats, such as a pond location and a wet marshy grassland area (Figure 8: Maps 2 & 4). The source of the water may be via seepage from the pond and impeded field drainage, however, it is unknown at present, and these should therefore continue to be categorised as Class 1 under a precautionary principle, until a full investigation is undertaken, if required.

A habitat management plan is advised to ensure that all sensitive habitats, such as, highly groundwater dependent communities are protected.

### 4.4.2 Water Flow

Any development should always take into consideration any effect on the water movement on Site, especially as there is lateral flow of water through the mineral soils into ditches and watercourses. There are multiple ponds and watercourses, including ditch systems, small burns to larger rivers within the Proposed Development. Mitigation and pollution prevention plans are required (as part of the CEMP) to avoid pollution of all watercourses.

Wetland habitats are known to be sensitive to changes in their water supply, whether this is from groundwater, surface water or rainwater.

All wetland features should be protected, especially during the construction phase as this is when sensitive habitats are at most risk from site traffic, soil/water runoff and potential pollutants. It is essential that sensitive ecological receptors are not impacted by the development. Therefore, the application of the mitigation hierarchy and construction good practice will be required.

Micro-siting may be required in a localised context, and for other non-habitat issues as yet unidentified.

It is possible to identify potential areas of concern and put measures in place to manage and control potential problems (such as in times of heavy rain) during the construction phase. The following are general control measures that can be used:

- Drainage ditches should be constructed on both the upslope and downslope if necessary, to control the routing of water and prevent it from getting onto the construction area.
- Drains or ditches carrying natural clean water must be prevented from being contaminated by dirty runoff from open construction surfaces;
- Clean water should not be diverted into the same areas as dirty runoff from construction surfaces. This will fill up silt settlement traps and fences too quickly, making them vulnerable to failure during heavy storm events; and
- Measures such as the use of silt fencing, silt traps and other suitable filtration methods can be employed. These mechanisms are intended to reduce the speed of flow, filter runoff and allow suspended silts and particulates to settle out naturally.

Areas of vulnerability will be identified prior to commencement, such as, steep gradients and wetland areas. Suitable site-specific drainage measures will be identified to suit these areas and will be shown clearly on the construction maps within the Construction and Environment Management Plan (CEMP), which will be provided prior to any constructional work commences.

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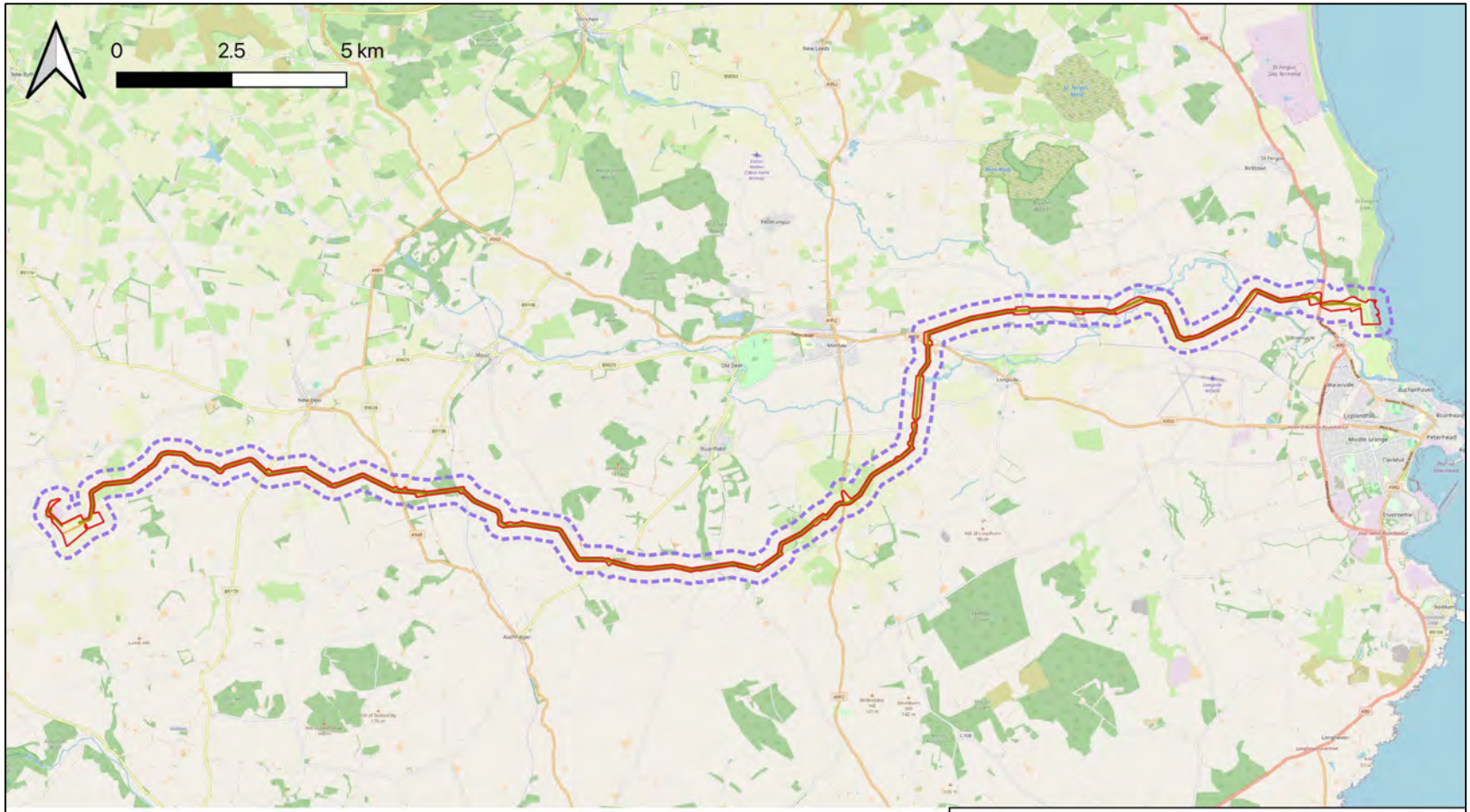
# 6 FIGURES




**Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure**

**Figure 1: Site Location Plan Overview, with 250m ESA**

**IMTeco Ltd**

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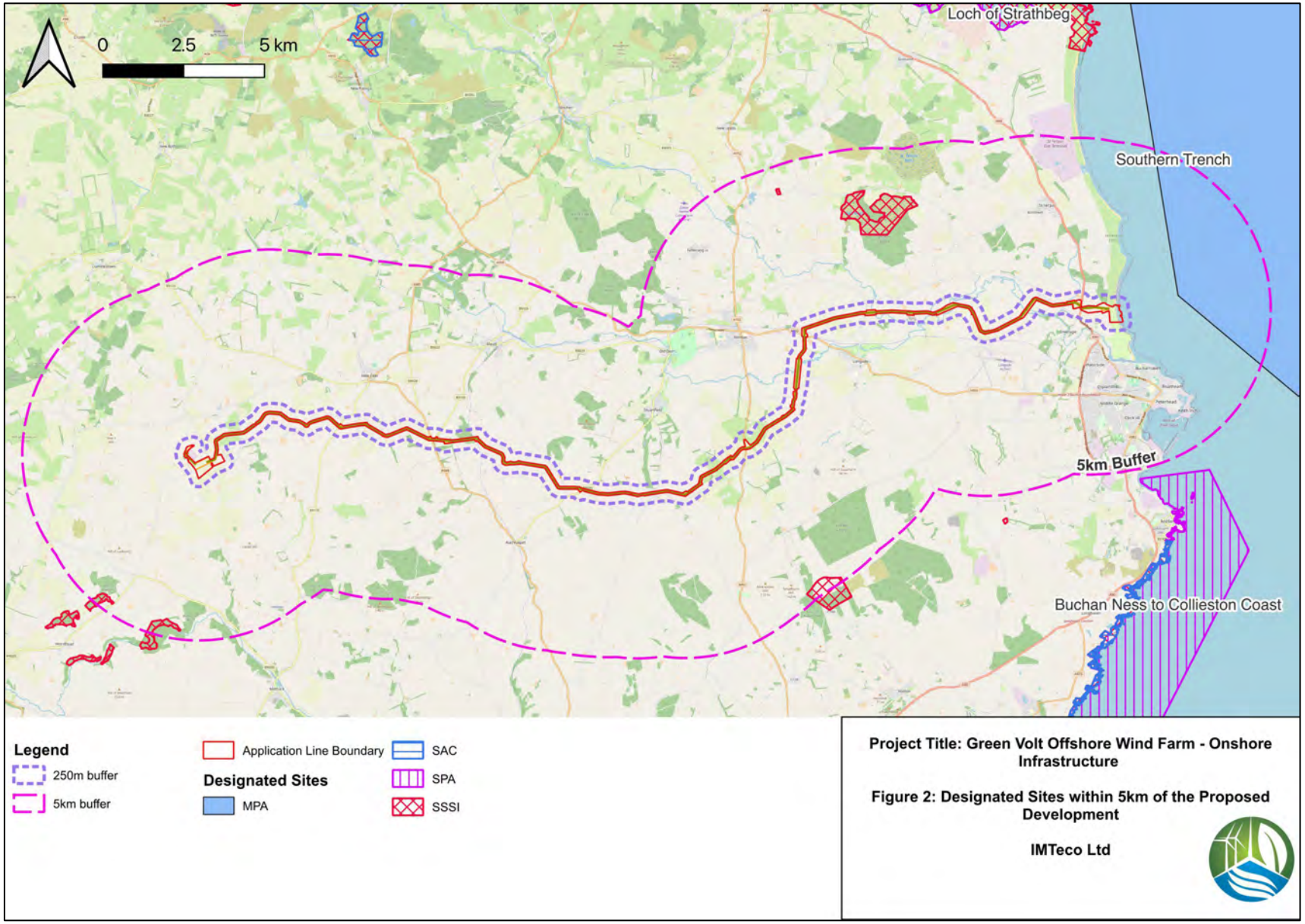
0
2.5
5 km
Loch of Strathbeg
Southern Trench
5km Buffer
Buchan Ness to Collieston Coast
Legend
250m buffer
5km buffer
Application Line Boundary
Designated Sites
MPA
SAC
SPA
SSSI
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Figure 2: Designated Sites within 5km of the Proposed Development
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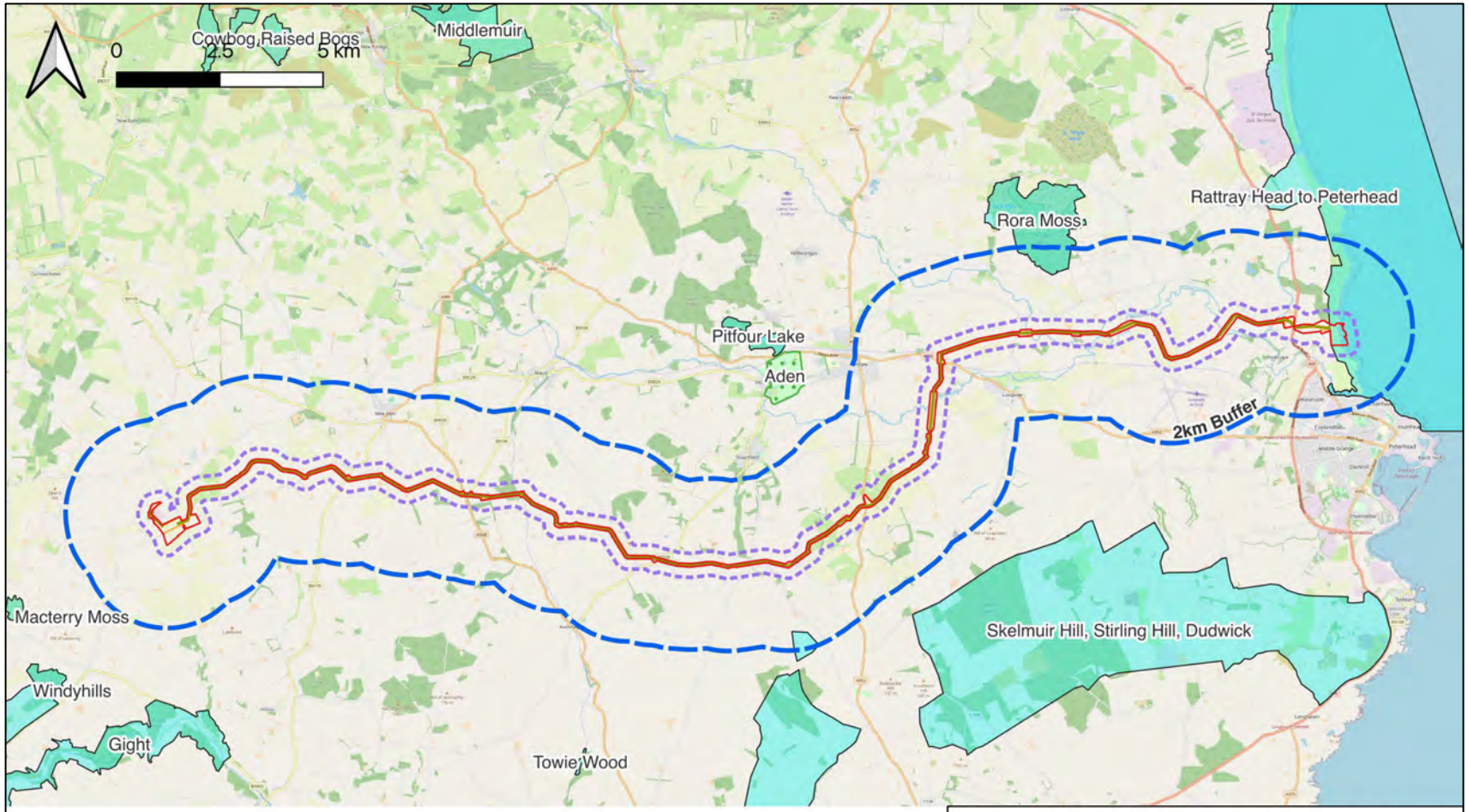


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**Figure 3: Non-Statutory Sites within 2km of the Proposed Development**

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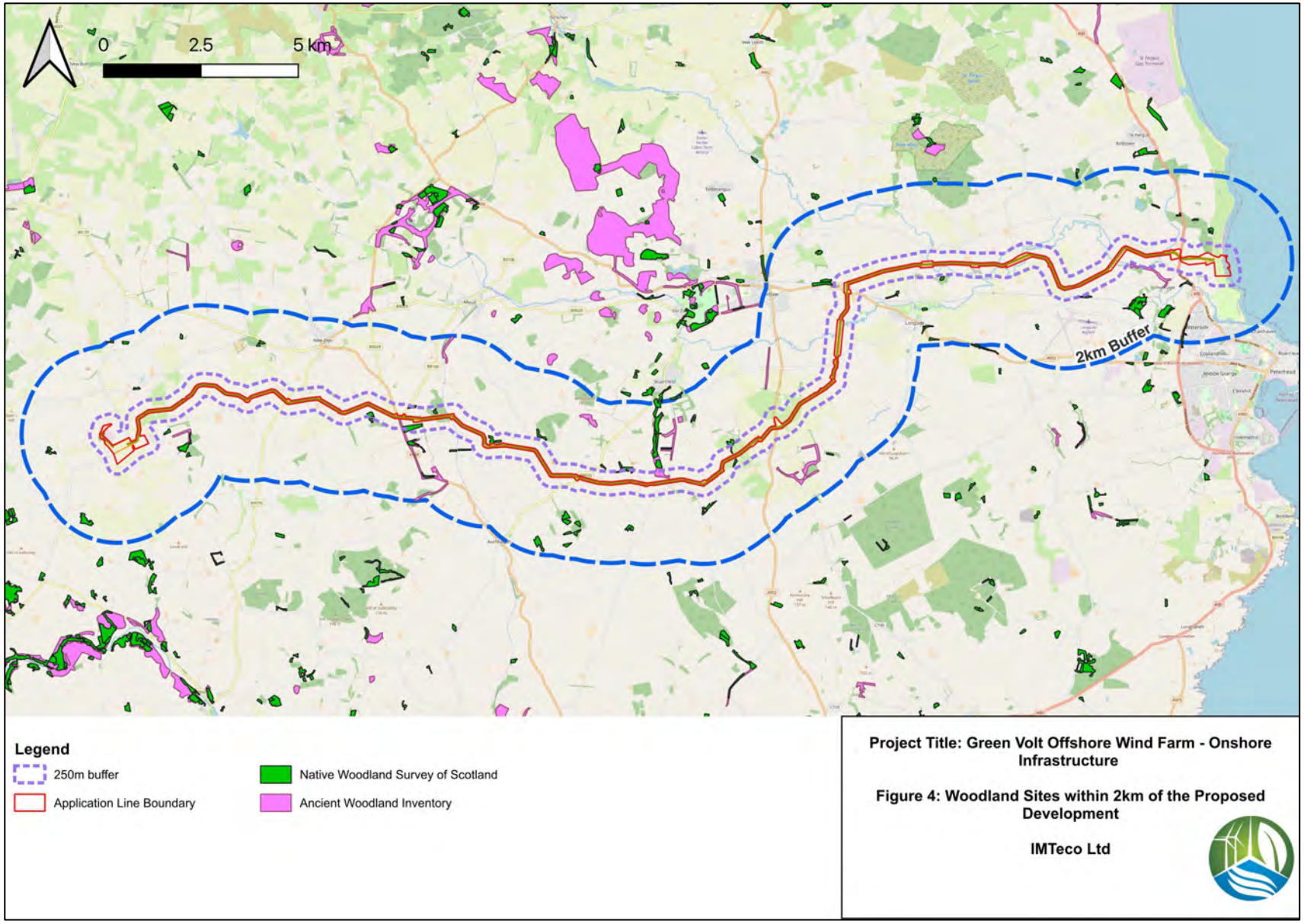
0
2.5
5 km
2km Buffer
Legend
250m buffer
Application Line Boundary
Native Woodland Survey of Scotland
Ancient Woodland Inventory
Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 4: Woodland Sites within 2km of the Proposed Development
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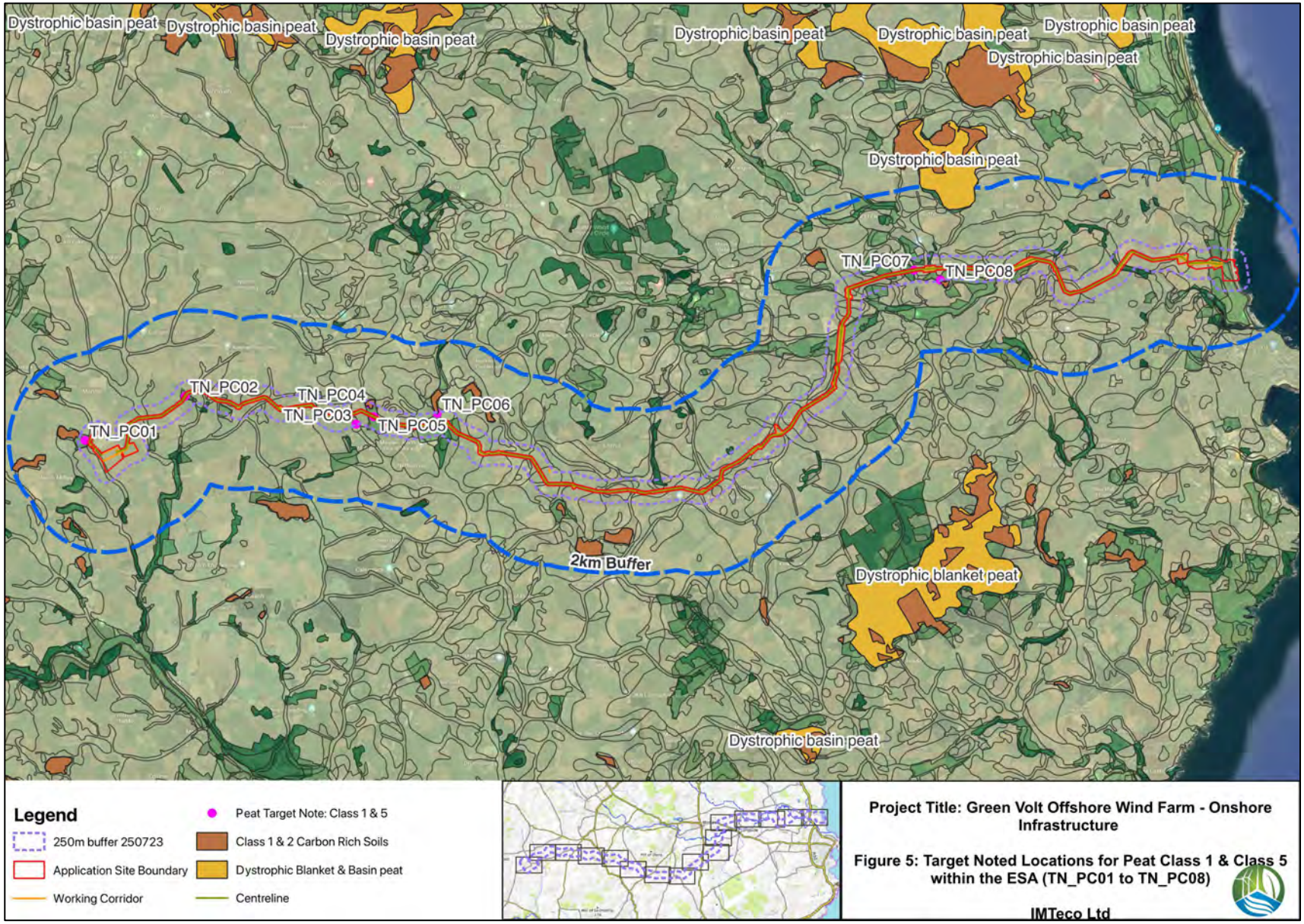
Dystrophic basin peat
Dystrophic basin peat
Dystrophic basin peat
Dystrophic basin peat
Dystrophic basin peat
Dystrophic basin peat
Dystrophic basin peat
Dystrophic basin peat
TN_PC01
TN_PC02
TN_PC03
TN_PC04
TN_PC05
TN_PC06
TN_PC07
TN_PC08
2km Buffer
Dystrophic blanket peat
Dystrophic basin peat
Legend
Peat Target Note: Class 1 & 5
250m buffer 250723
Class 1 & 2 Carbon Rich Soils
Application Site Boundary
Dystrophic Blanket & Basin peat
Working Corridor
Centreline
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Figure 5: Target Noted Locations for Peat Class 1 & Class 5 within the ESA (TN_PC01 to TN_PC08)
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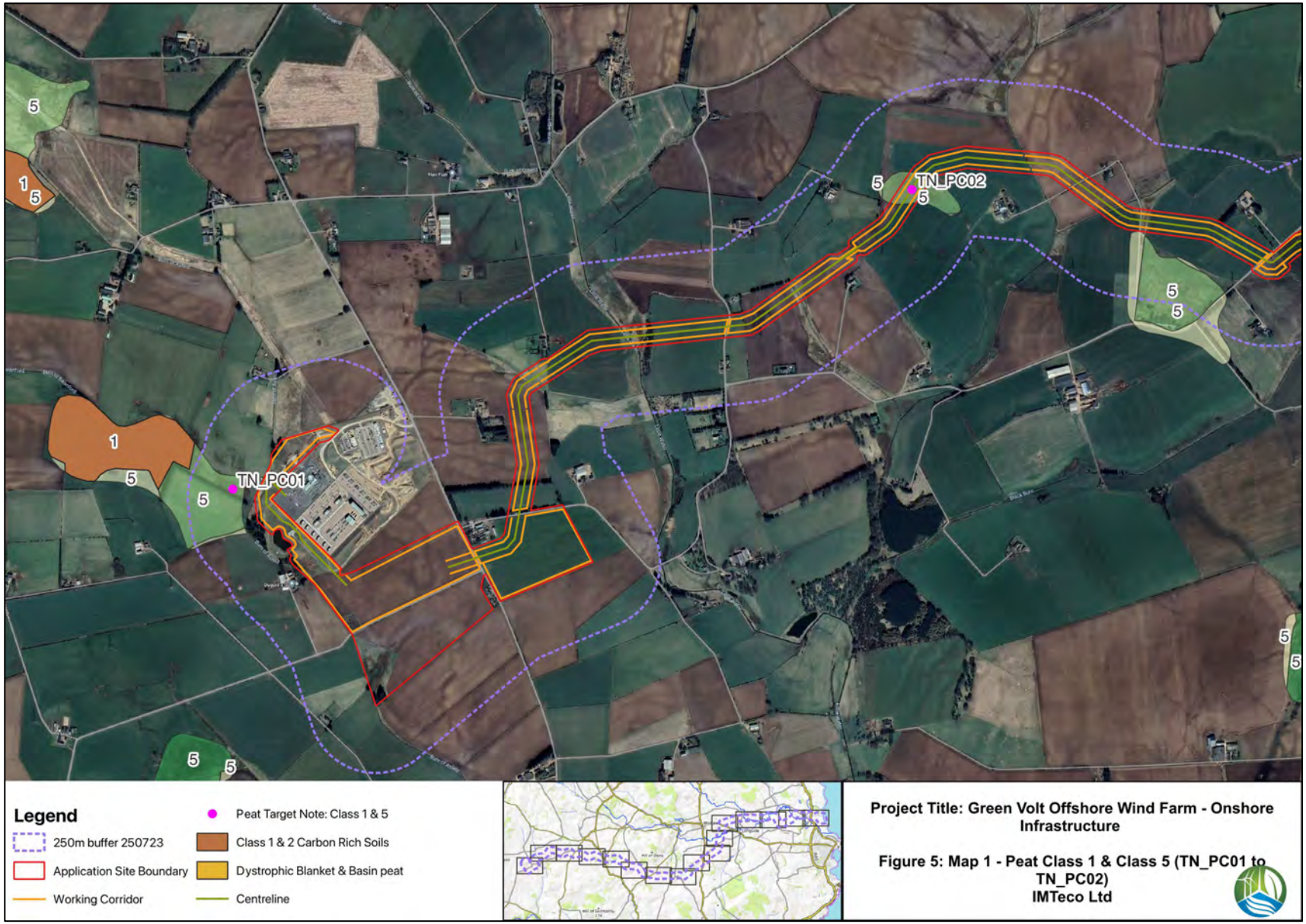
TN_PC01
TN_PC02
Legend
Peat Target Note: Class 1 & 5
250m buffer 250723
Class 1 & 2 Carbon Rich Soils
Application Site Boundary
Dystrophic Blanket & Basin peat
Working Corridor
Centreline
Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 5: Map 1 - Peat Class 1 & Class 5 (TN_PC01 to TN_PC02)
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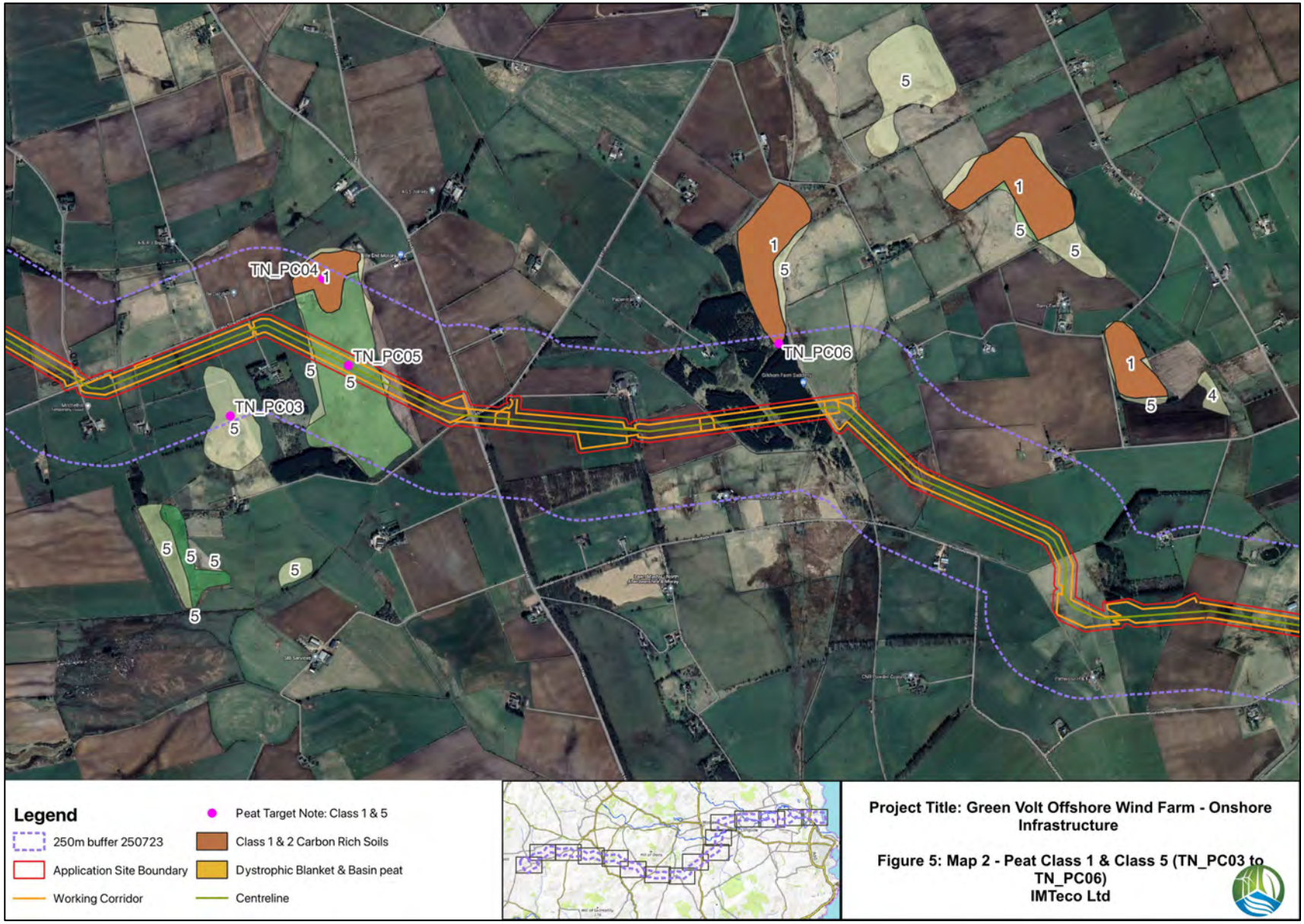
TN_PC04
TN_PC05
TN_PC03
TN_PC06
Legend
Peat Target Note: Class 1 & 5
250m buffer 250723
Class 1 & 2 Carbon Rich Soils
Application Site Boundary
Dystrophic Blanket & Basin peat
Working Corridor
Centreline
Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 5: Map 2 - Peat Class 1 & Class 5 (TN_PC03 to TN_PC06)
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TN_PC07
TN_PC08
Legend
Peat Target Note: Class 1 & 5
250m buffer 250723
Class 1 & 2 Carbon Rich Soils
Application Site Boundary
Dystrophic Blanket & Basin peat
Working Corridor
Centreline
Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 5: Map 3 - Peat Class 1 & Class 5 (TN_PC07 to TN_PC08)
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**Phase 1 Polygons**

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.2.2 - Coniferous woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved Parkland/scattered trees
- A3.2 - Coniferous Parkland/scattered trees
- A3.3 - Mixed Parkland/scattered trees
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- C3.1 - Other tall herb and fern - ruderal
- E1.7 - Wet modified bog
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- H1.1 - Intertidal - mud/sand
- H6.5 - Dune grassland
- I2.1 - Quarry
- J1.1 - Cultivated/disturbed land - arable
- J1.2 - Cultivated/disturbed land - amenity grassland
- Ditch
- Marine

**Tree & hedge Line**

- A2.1 - Scrub - dense
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved Parkland/scattered trees
- A3.2 - Coniferous Parkland/scattered trees
- A3.3 - Mixed Parkland/scattered trees
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.3.2 - Hedge with trees - species-poor
- Watercourses/Running water
- 250m ESA buffer

**Google Terrain Hybrid**

**Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure**

**Phase 1 Legend (Figure 6: Maps 1 - 16**

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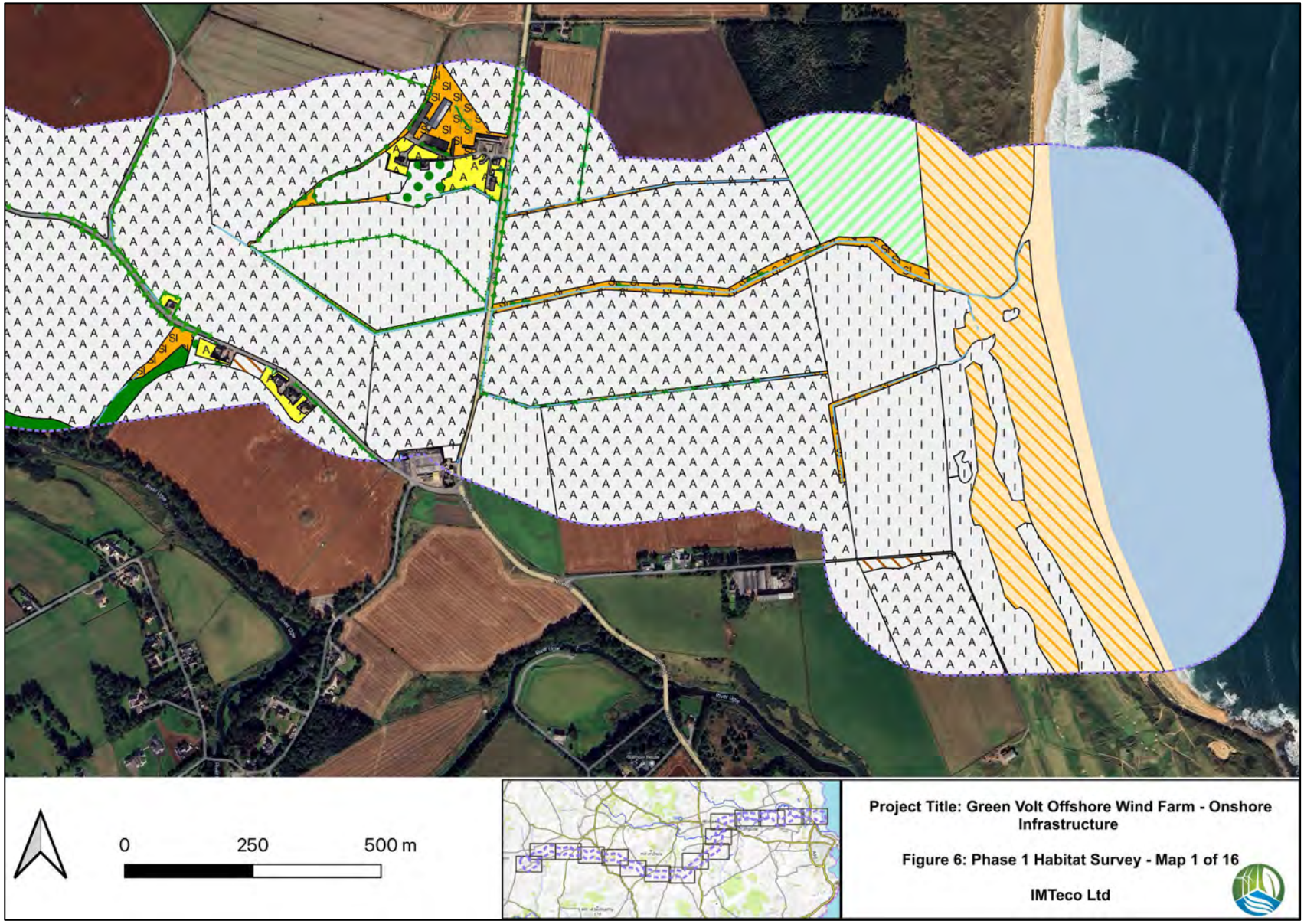
0
250
500 m
Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 6: Phase 1 Habitat Survey - Map 1 of 16
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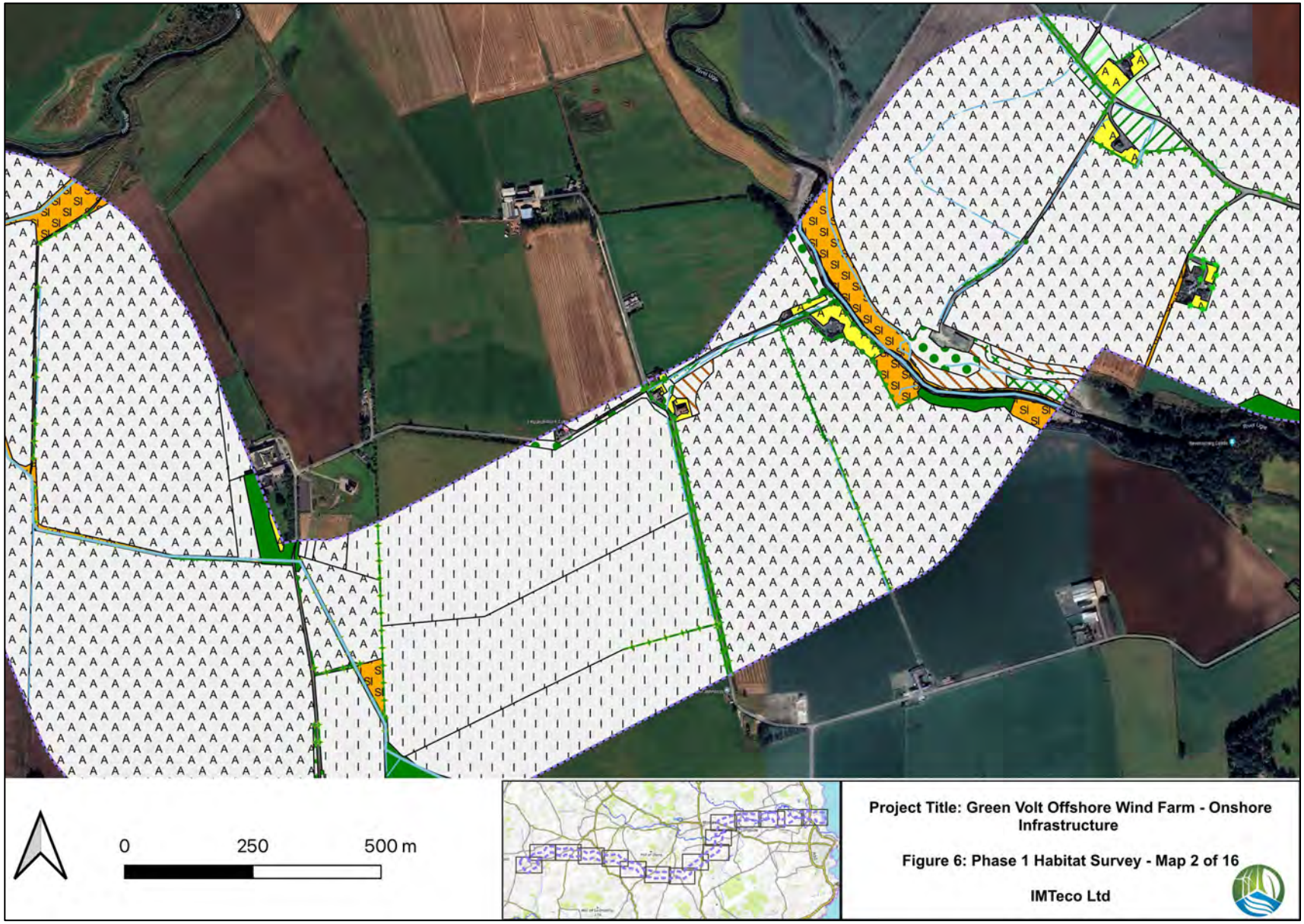
0
250
500 m
Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 6: Phase 1 Habitat Survey - Map 2 of 16
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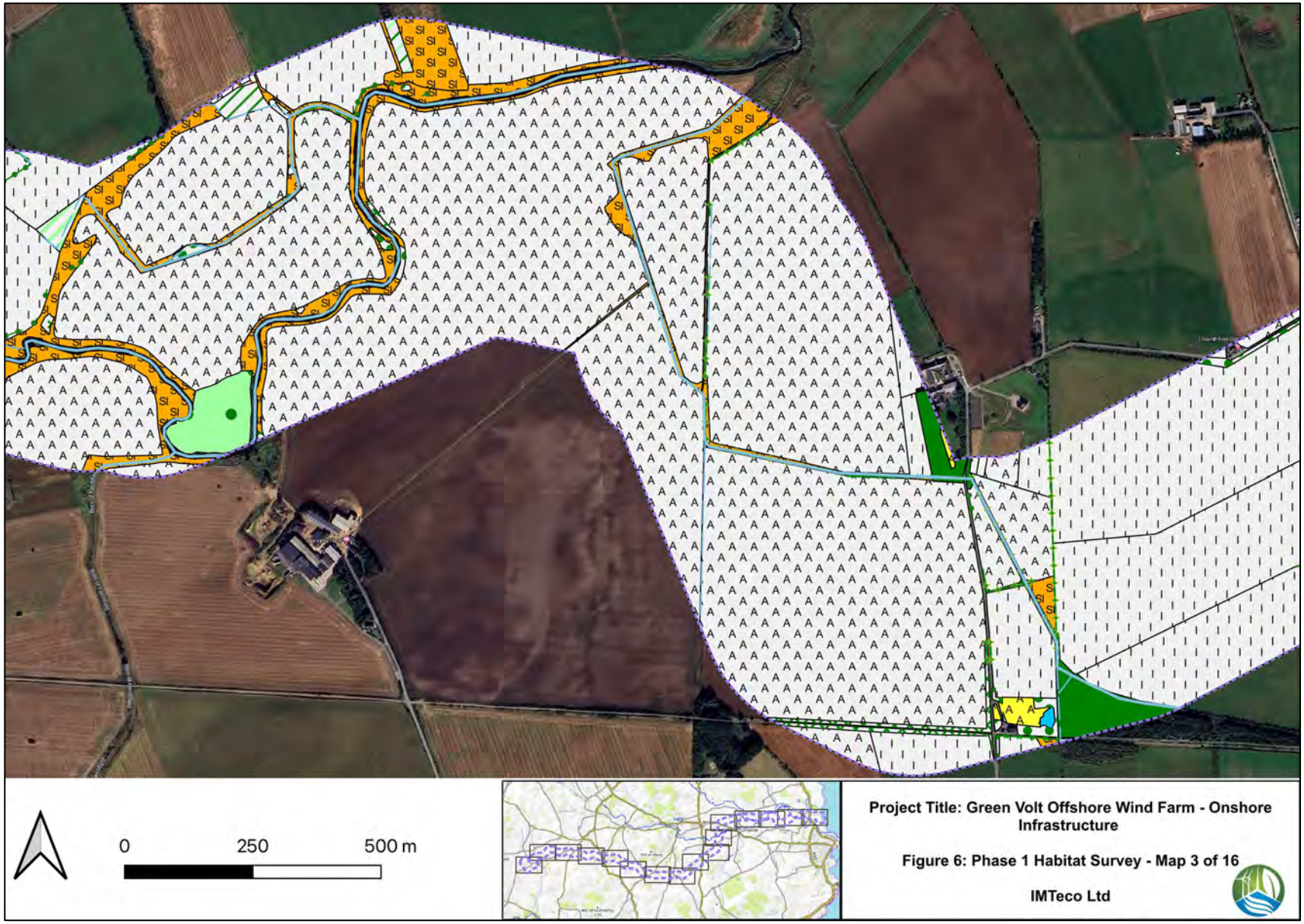
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Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 6: Phase 1 Habitat Survey - Map 3 of 16
IMTeco Ltd

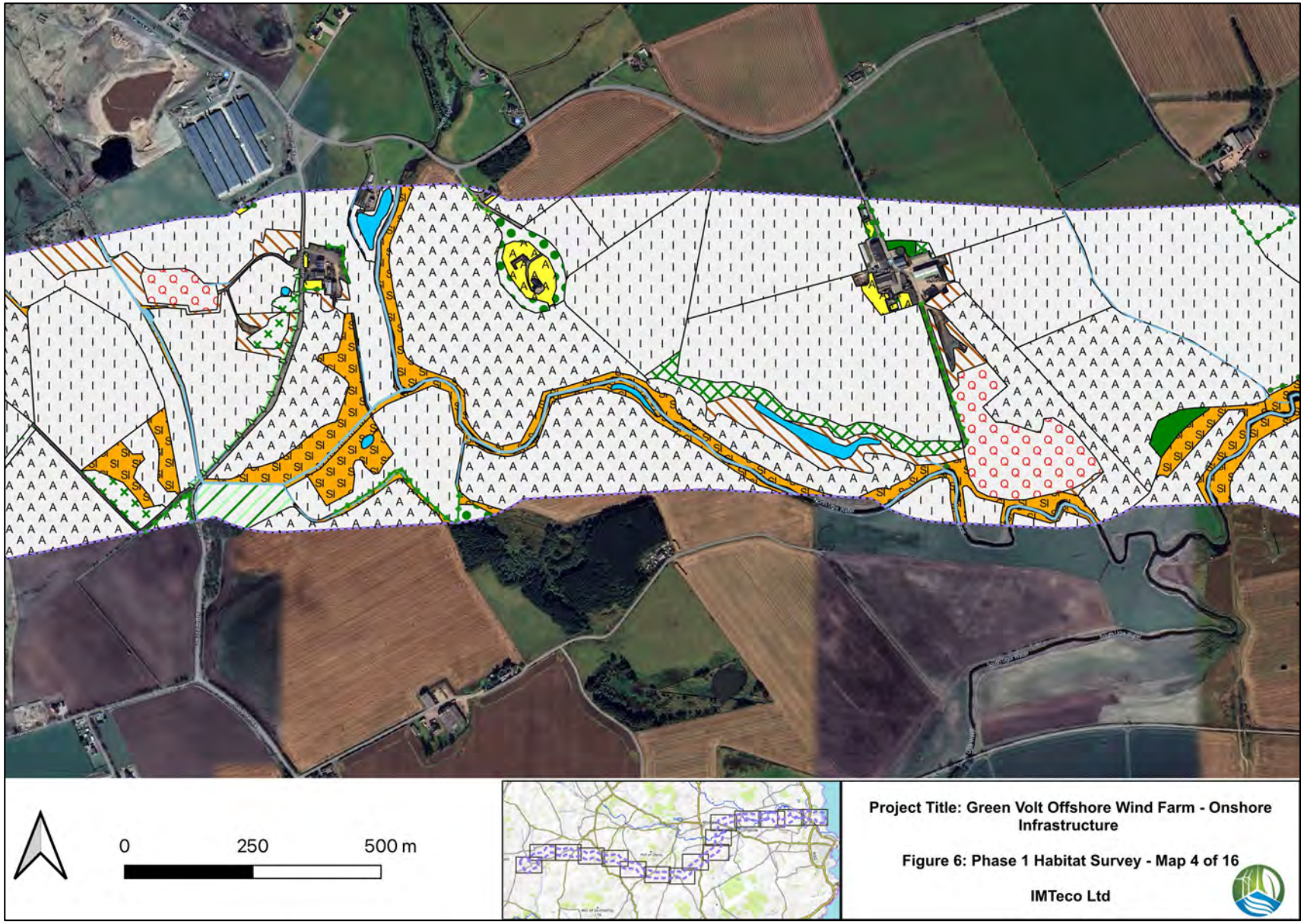
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Figure 6: Phase 1 Habitat Survey - Map 4 of 16
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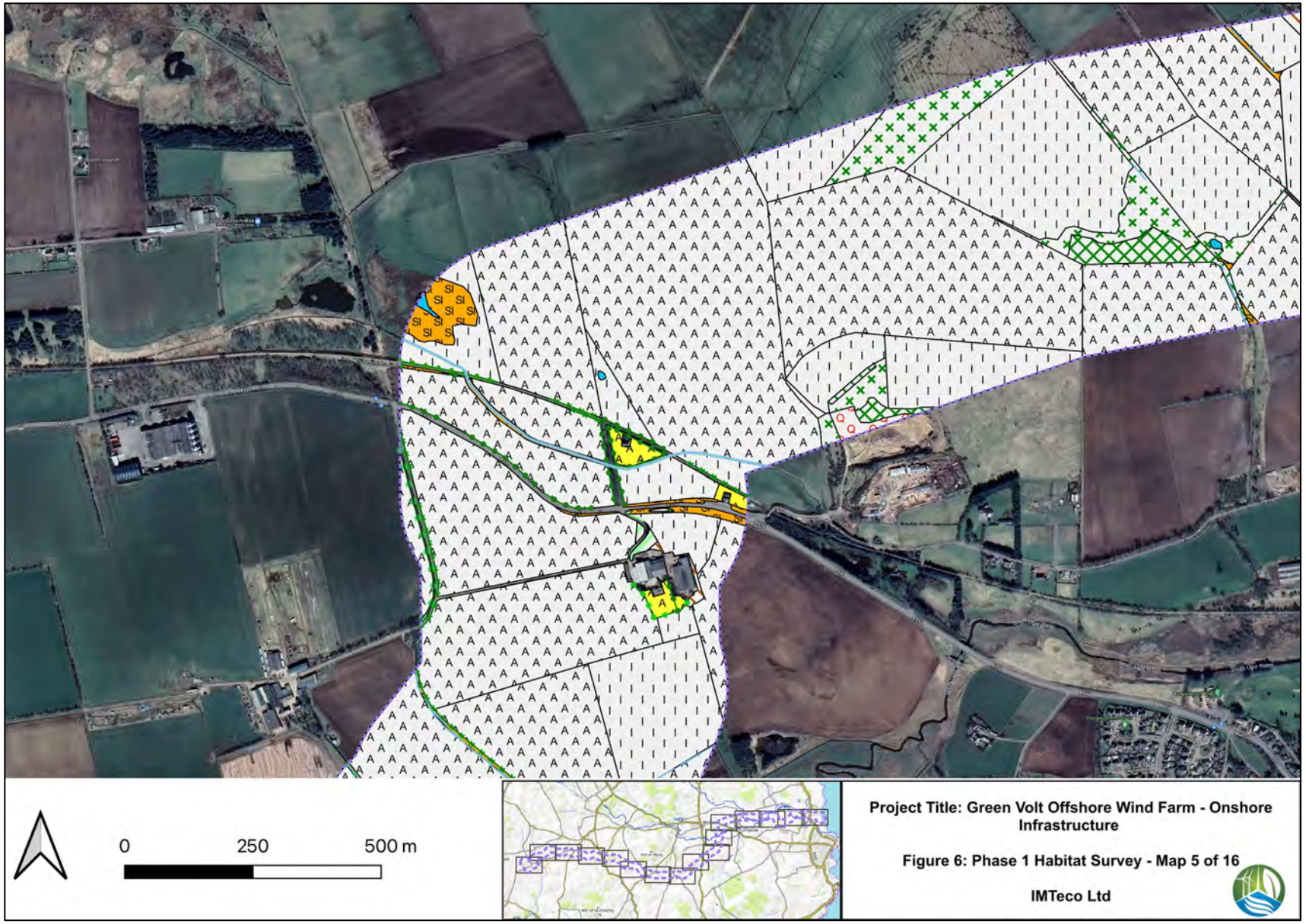
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Figure 6: Phase 1 Habitat Survey - Map 5 of 16
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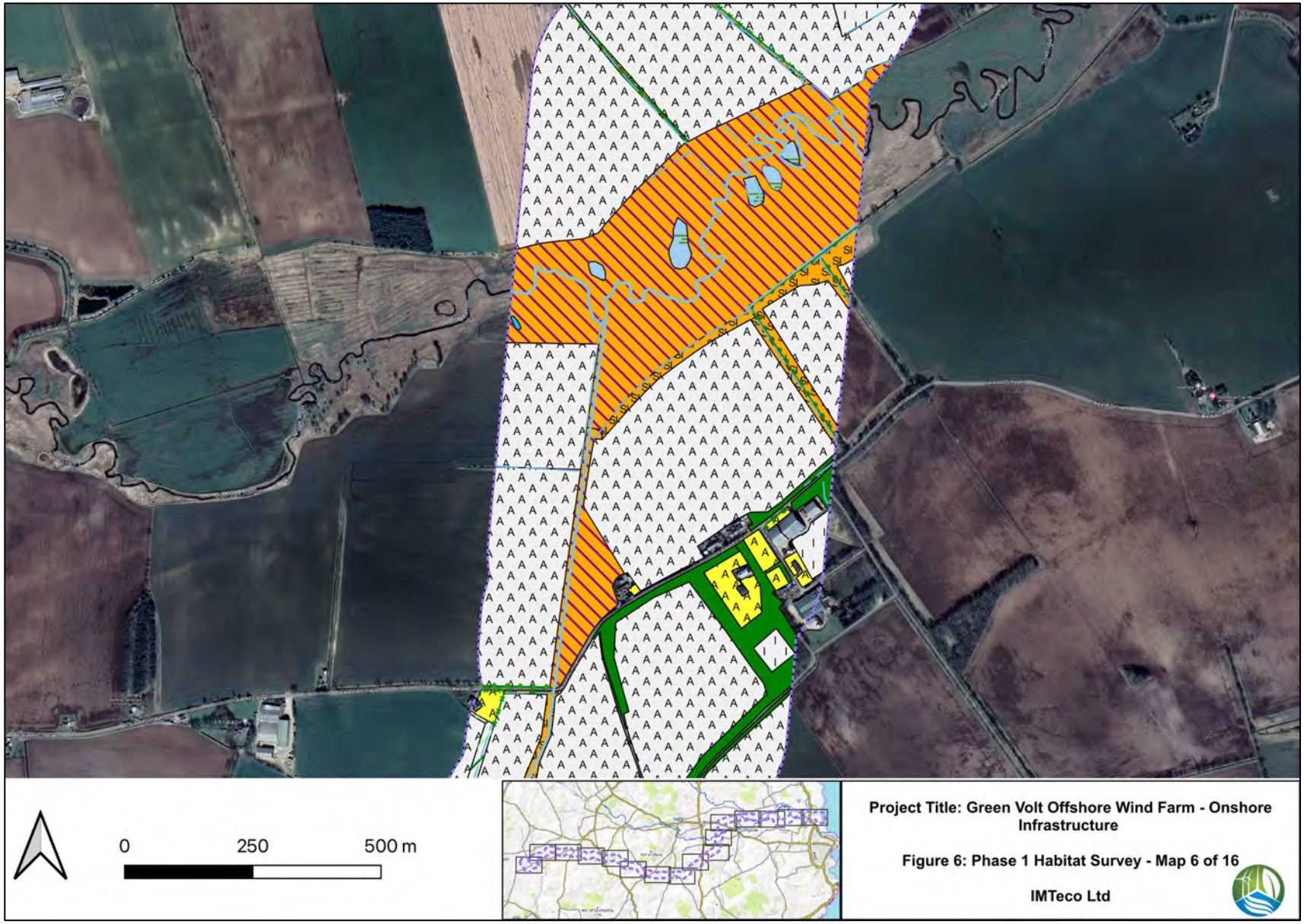
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Figure 6: Phase 1 Habitat Survey - Map 6 of 16
IMTeco Ltd

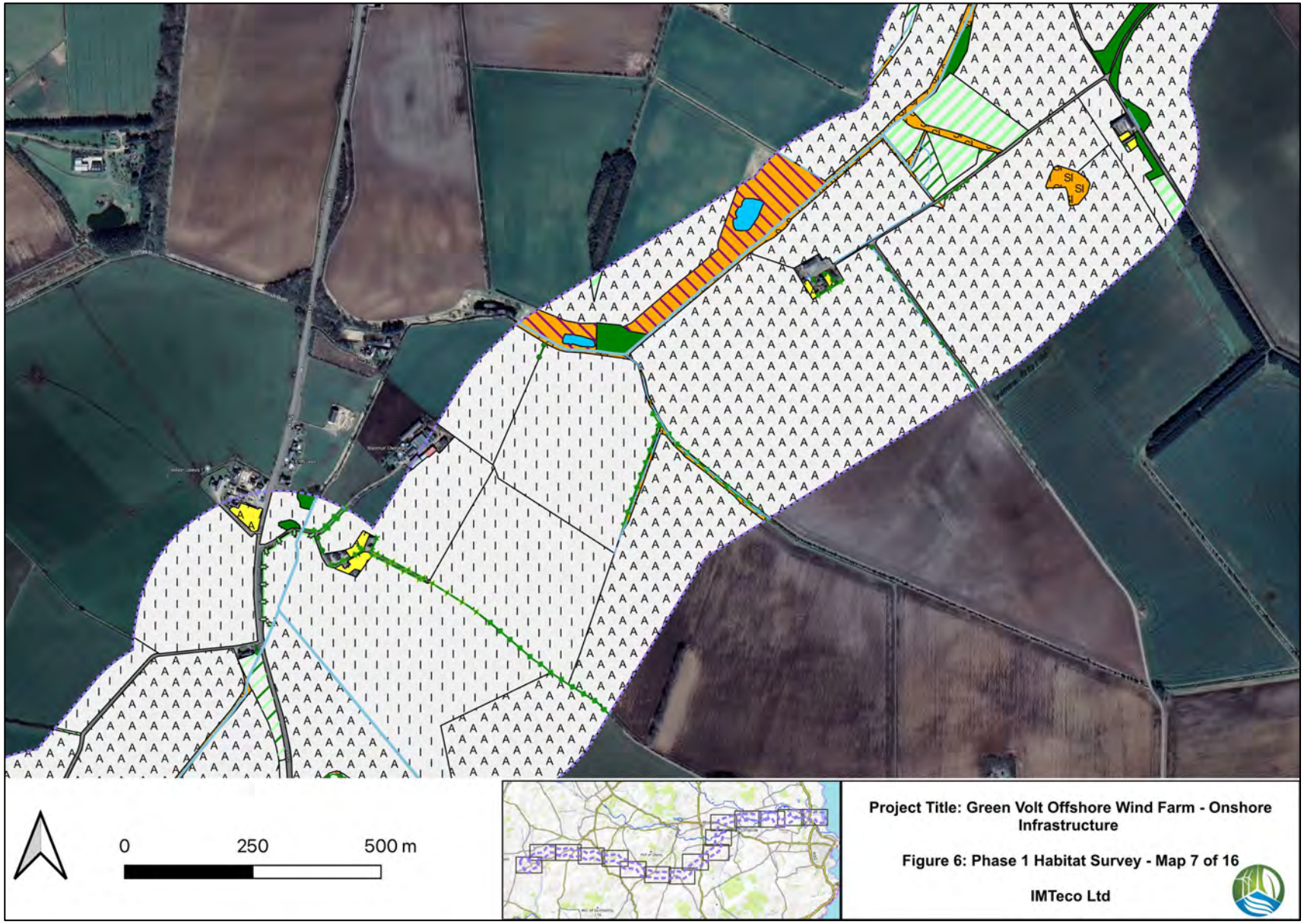
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Figure 6: Phase 1 Habitat Survey - Map 7 of 16
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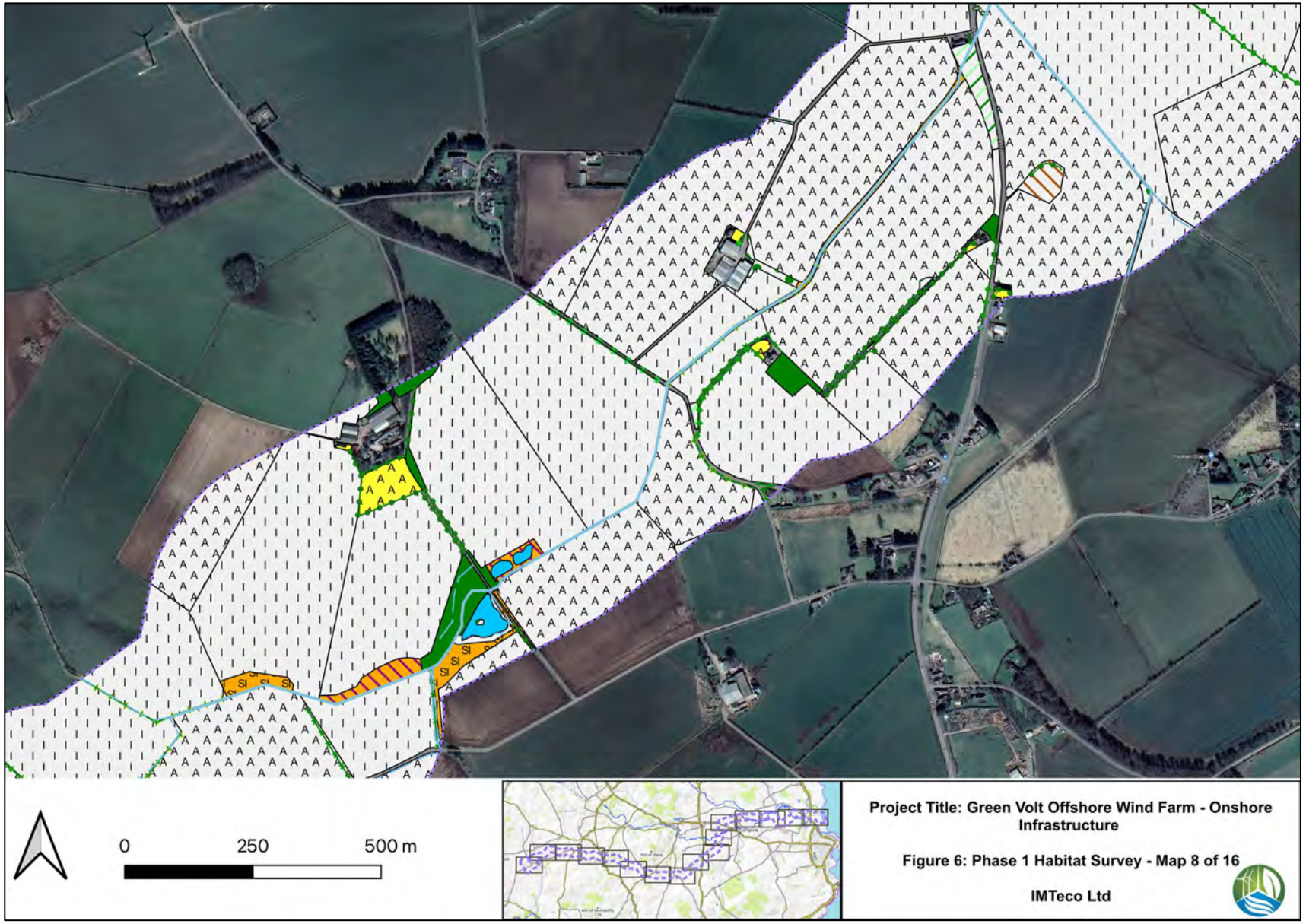
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Figure 6: Phase 1 Habitat Survey - Map 8 of 16
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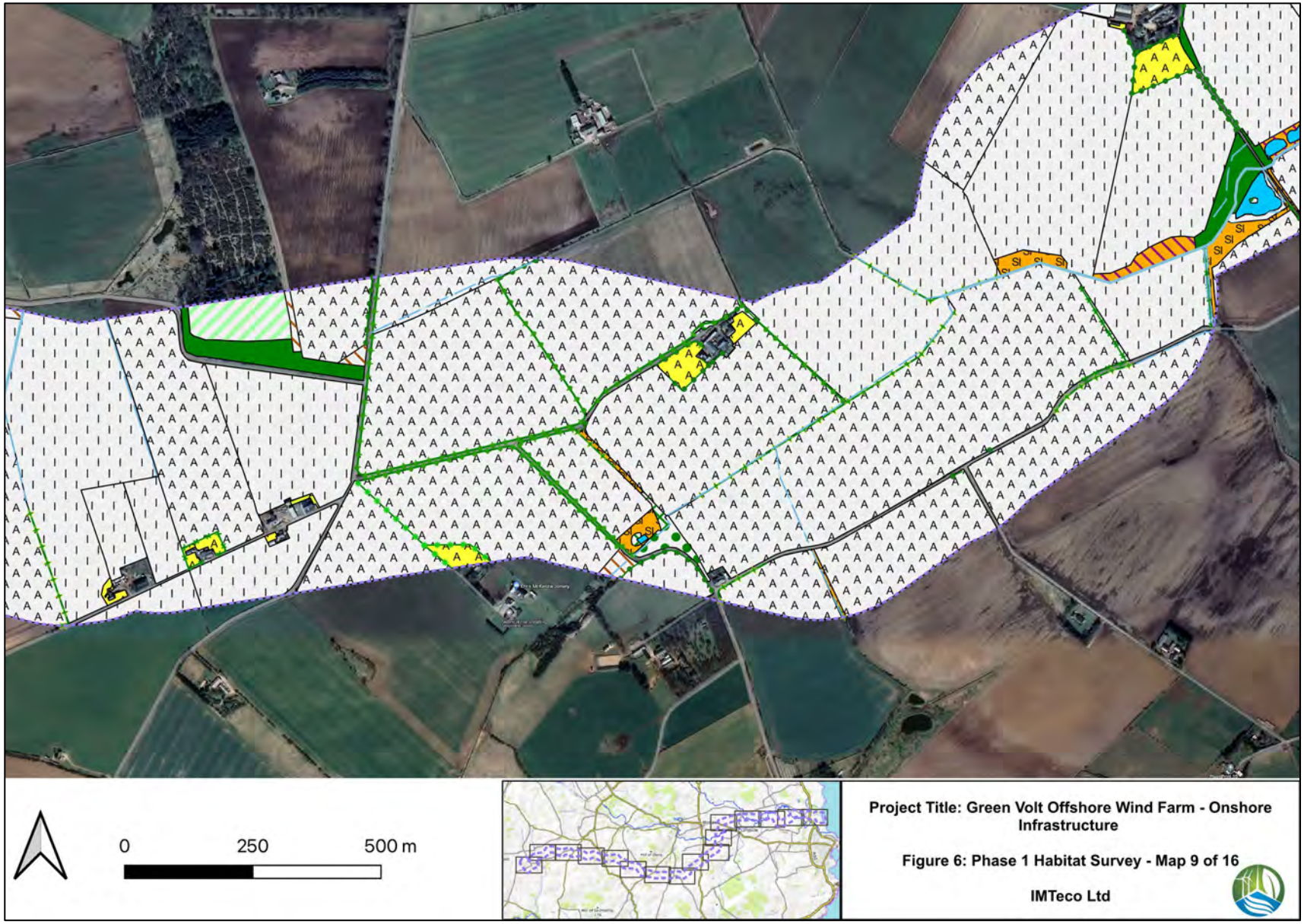
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Figure 6: Phase 1 Habitat Survey - Map 9 of 16
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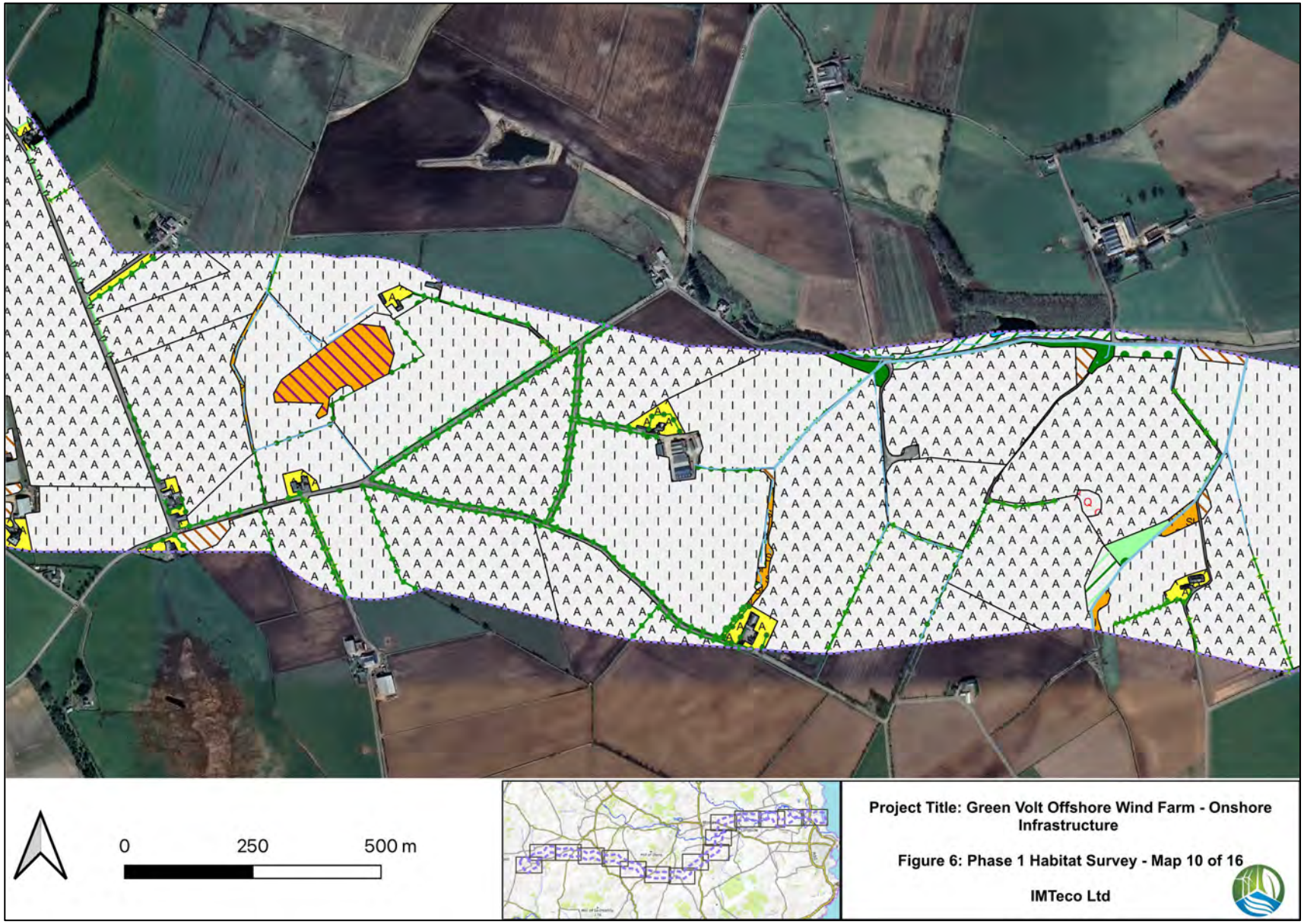
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Figure 6: Phase 1 Habitat Survey - Map 10 of 16
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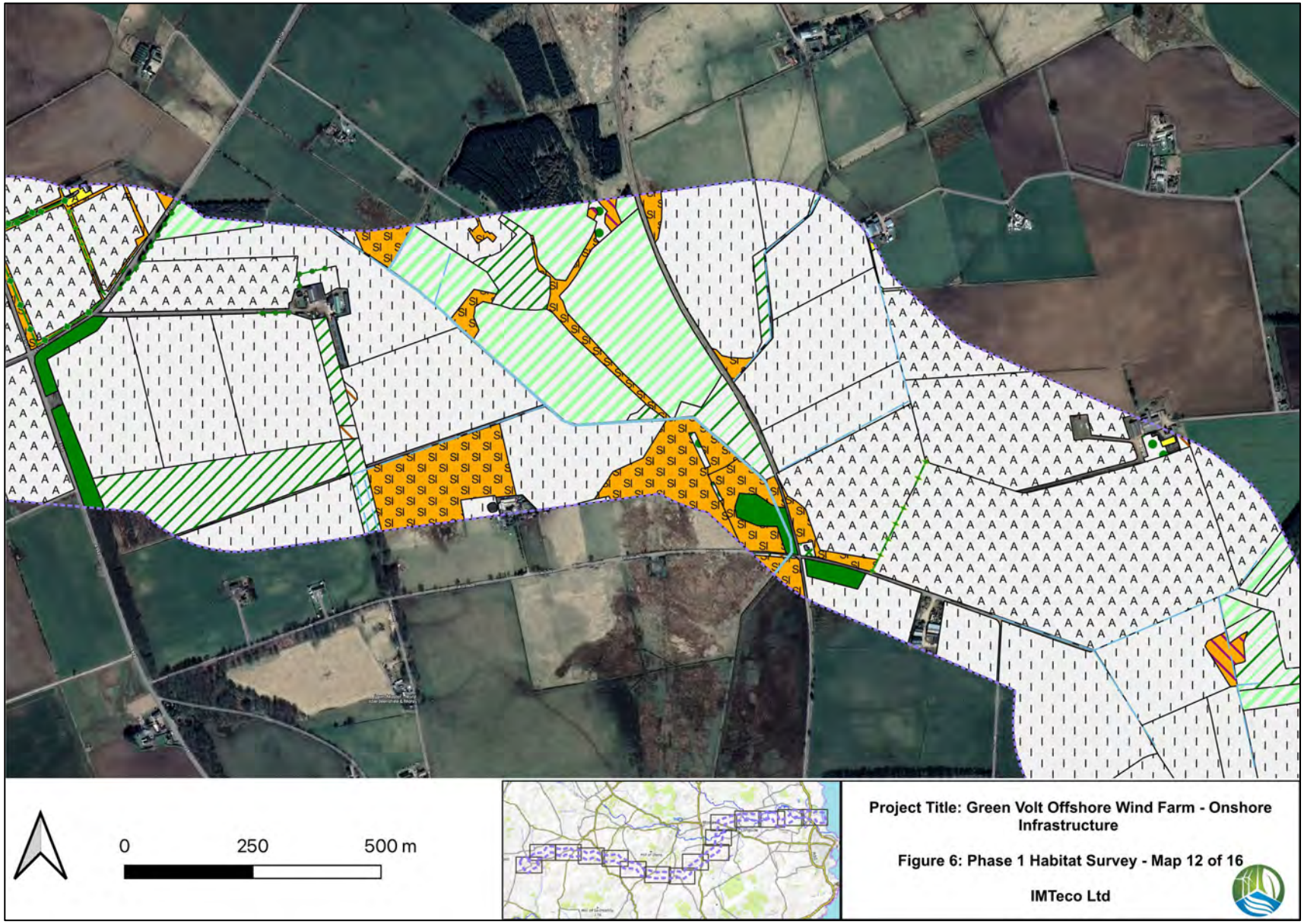
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Figure 6: Phase 1 Habitat Survey - Map 12 of 16
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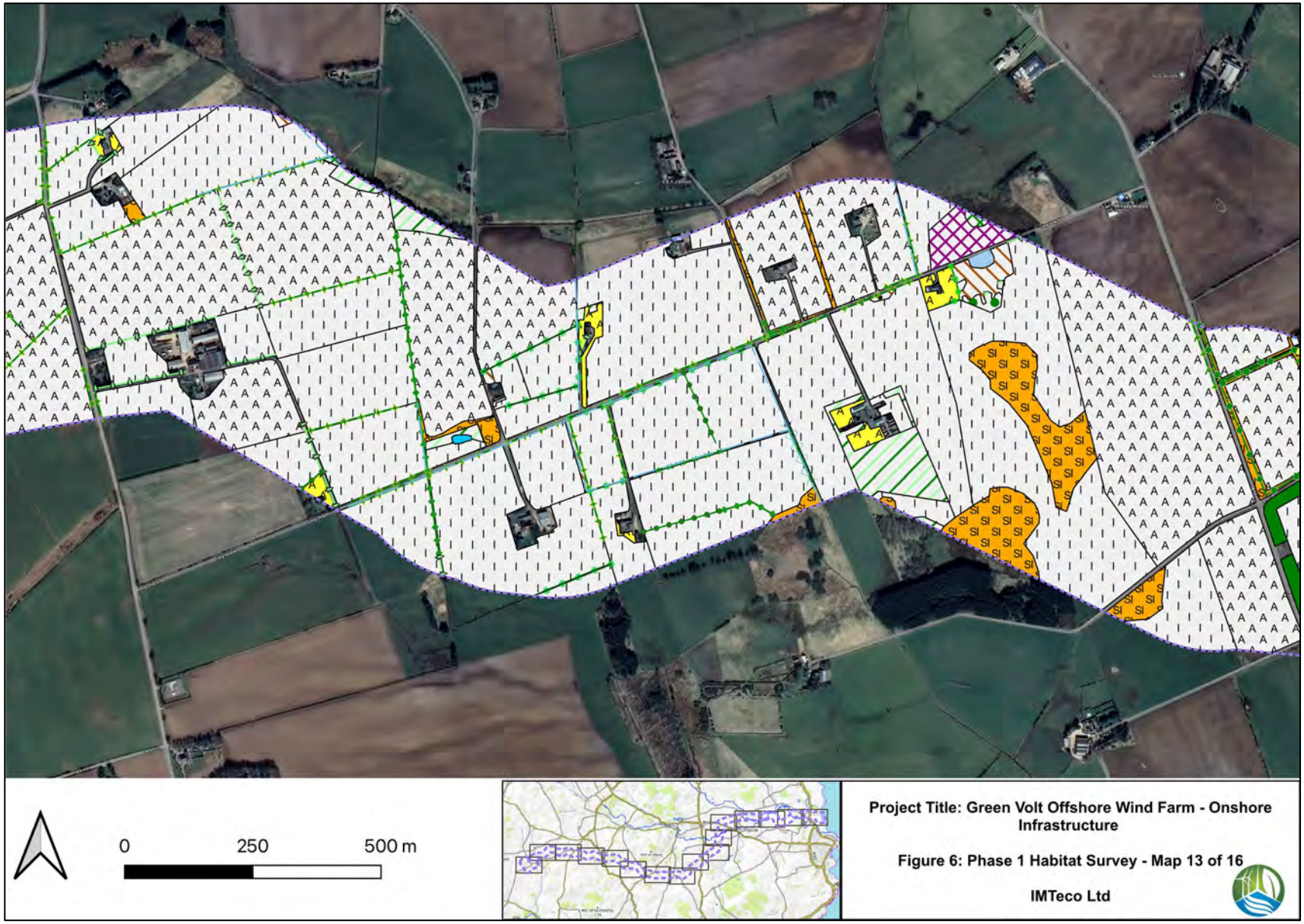
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Figure 6: Phase 1 Habitat Survey - Map 13 of 16
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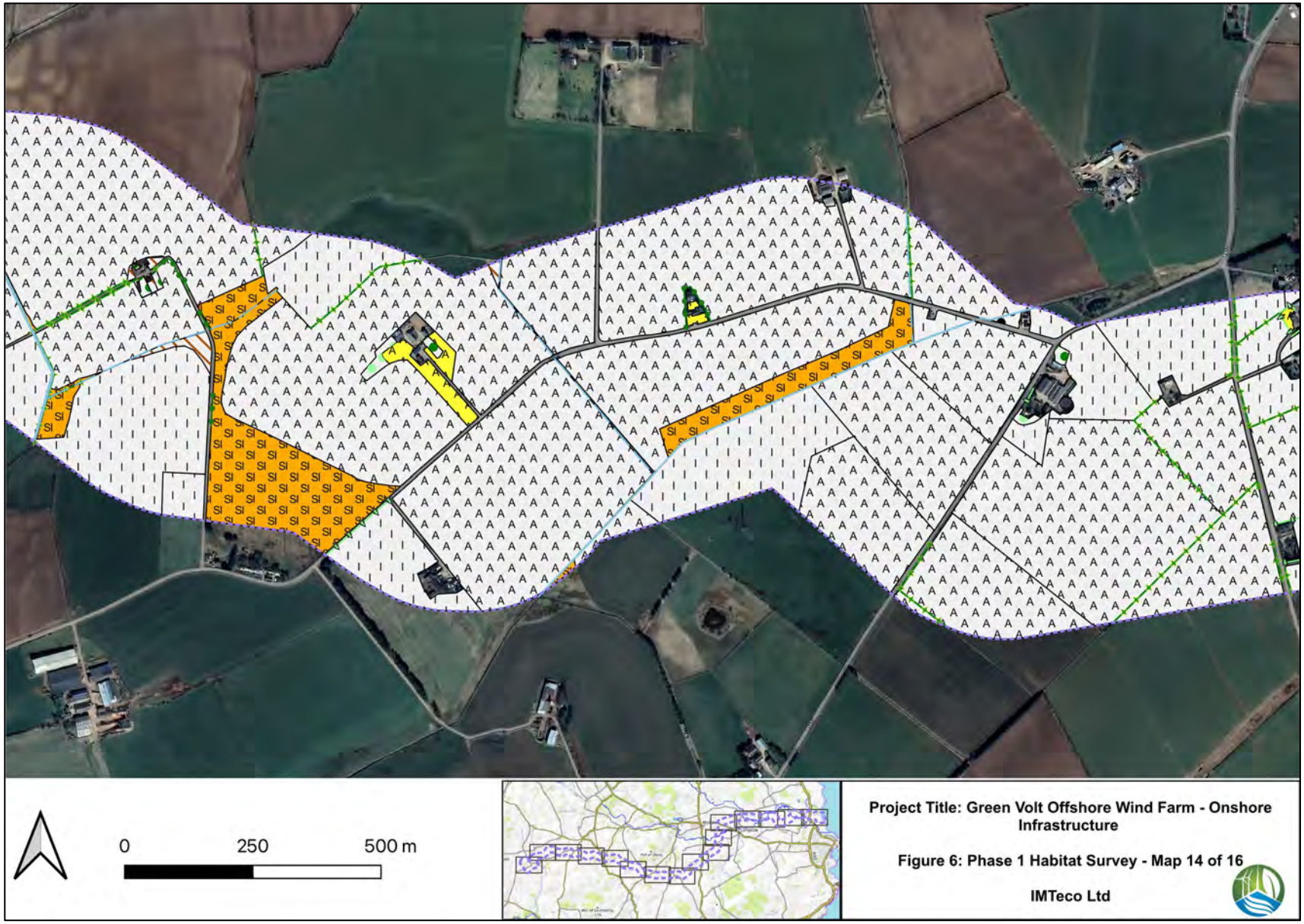
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Figure 6: Phase 1 Habitat Survey - Map 14 of 16
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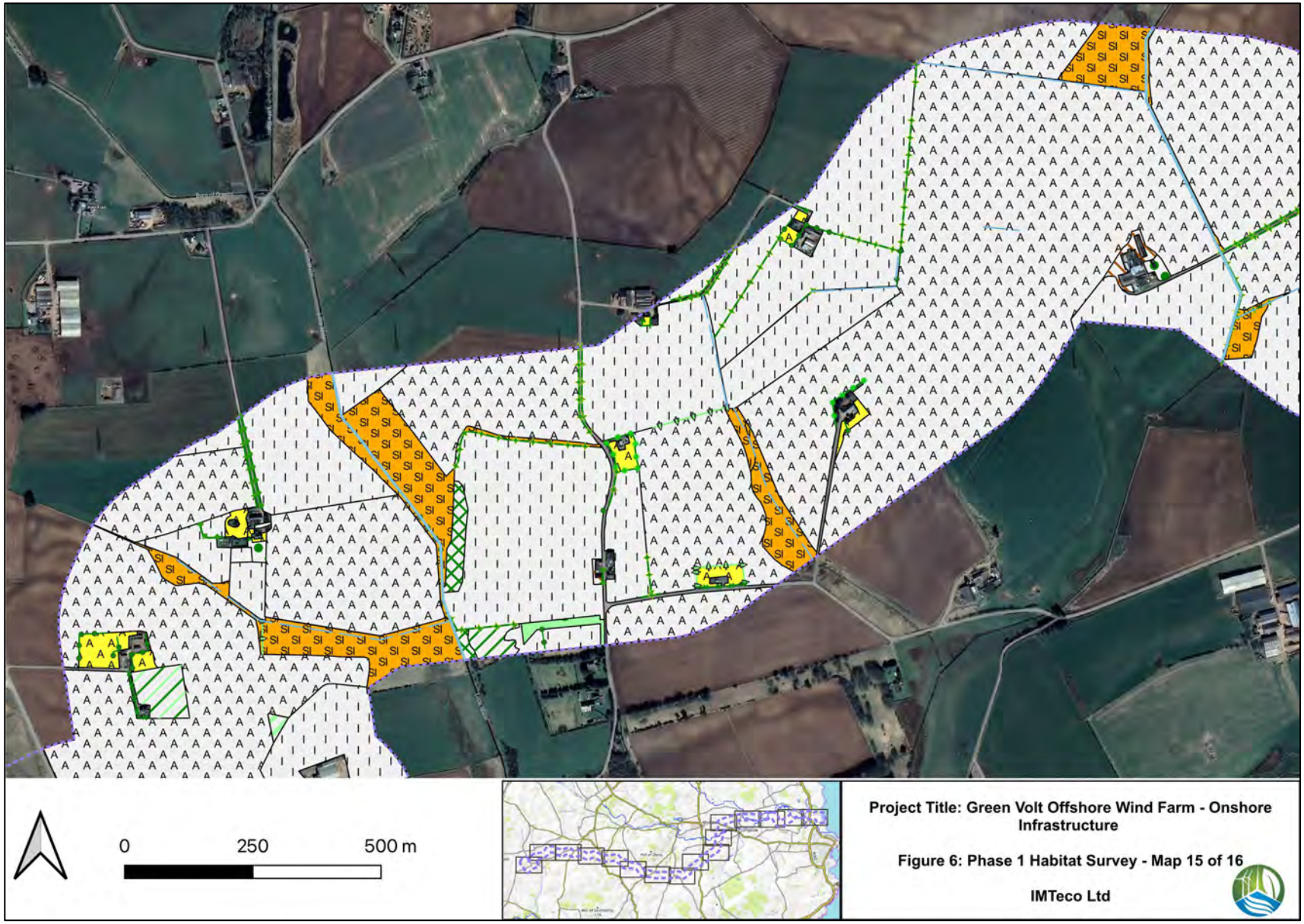
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Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 6: Phase 1 Habitat Survey - Map 15 of 16
IMTeco Ltd


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Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 6: Phase 1 Habitat Survey - Map 16 of 16
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**NVC Polygon Legend**

- Bogs (M18, M20a, M25)
- Other mires (M23, M27)
- Unimproved neutral grasslands (MG5,MG10a)
- Improved grasslands (MG6,MG7)
- Native broadleaved woodland & scrub (W4,W7,W9,W11,W23)
- Swamps and fens (S5,S9,S28)
- Sand dunes (SD5b,SD6a,SD6e,SD8a,SD9a)
- Other vegetation types (OV21,OV22,OV25,OV27)
- Conifer plantation (non NVC)
- Broadleaved plantation (non NVC)
- Anything else (bare ground,open water, etc)
- Watercourses/Running water
- 250m ESA buffer

**Google Terrain Hybrid**

**Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure**

**NVC Legend (Figure 7: Maps 1 - 16)**

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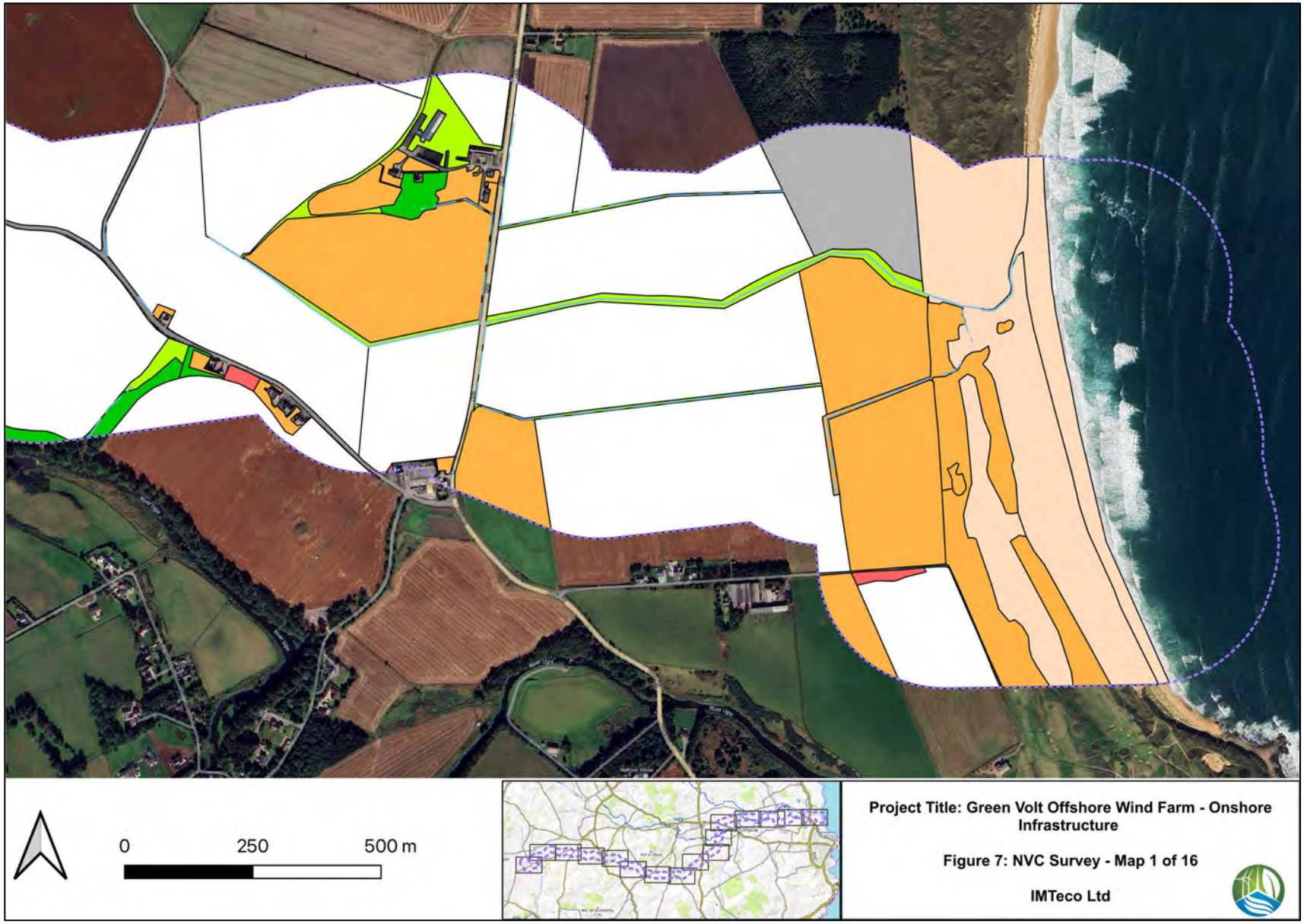
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Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 7: NVC Survey - Map 1 of 16
IMTeco Ltd


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Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 7: NVC Survey - Map 2 of 16
IMTeco Ltd

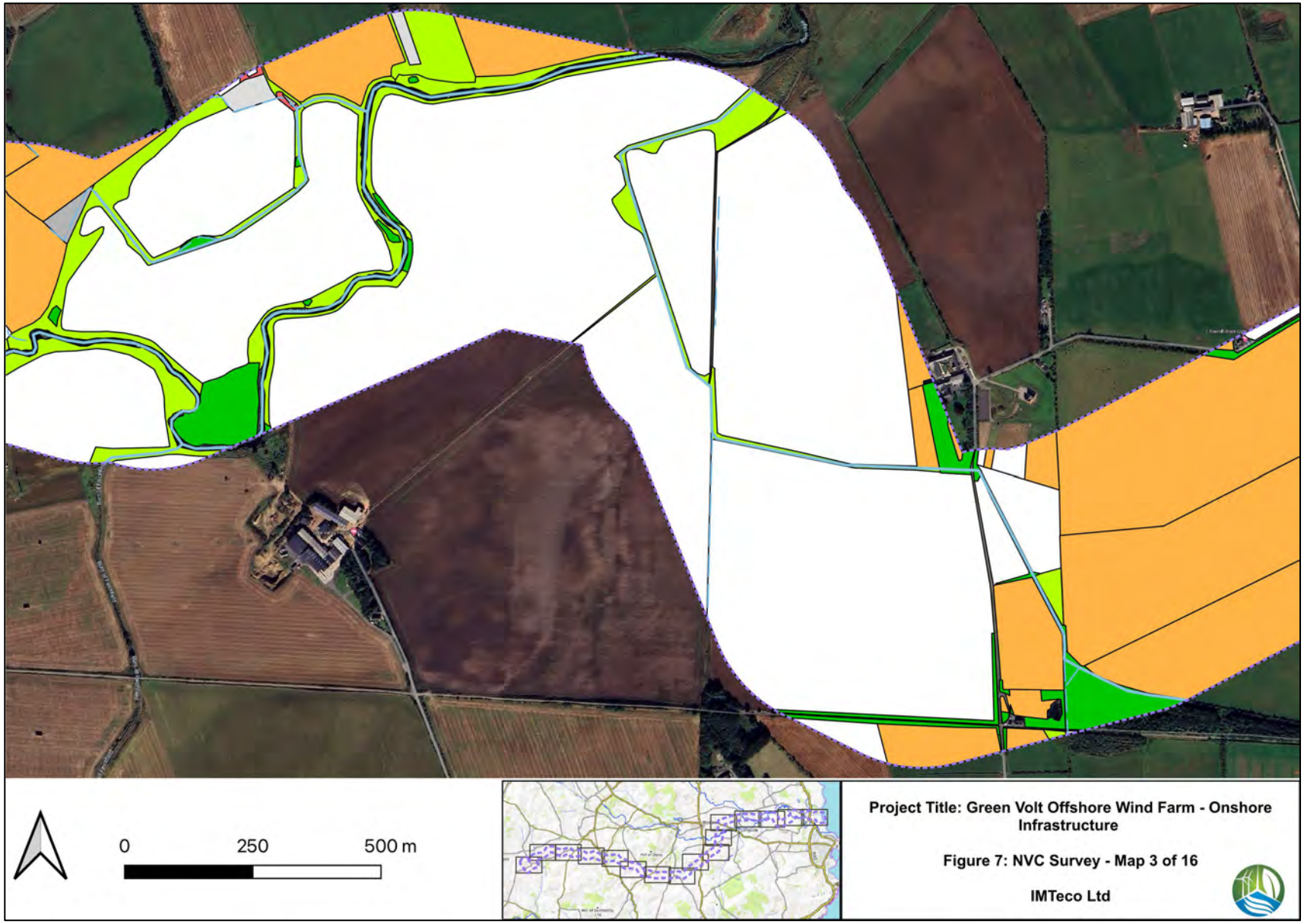
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Figure 7: NVC Survey - Map 3 of 16
IMTeco Ltd

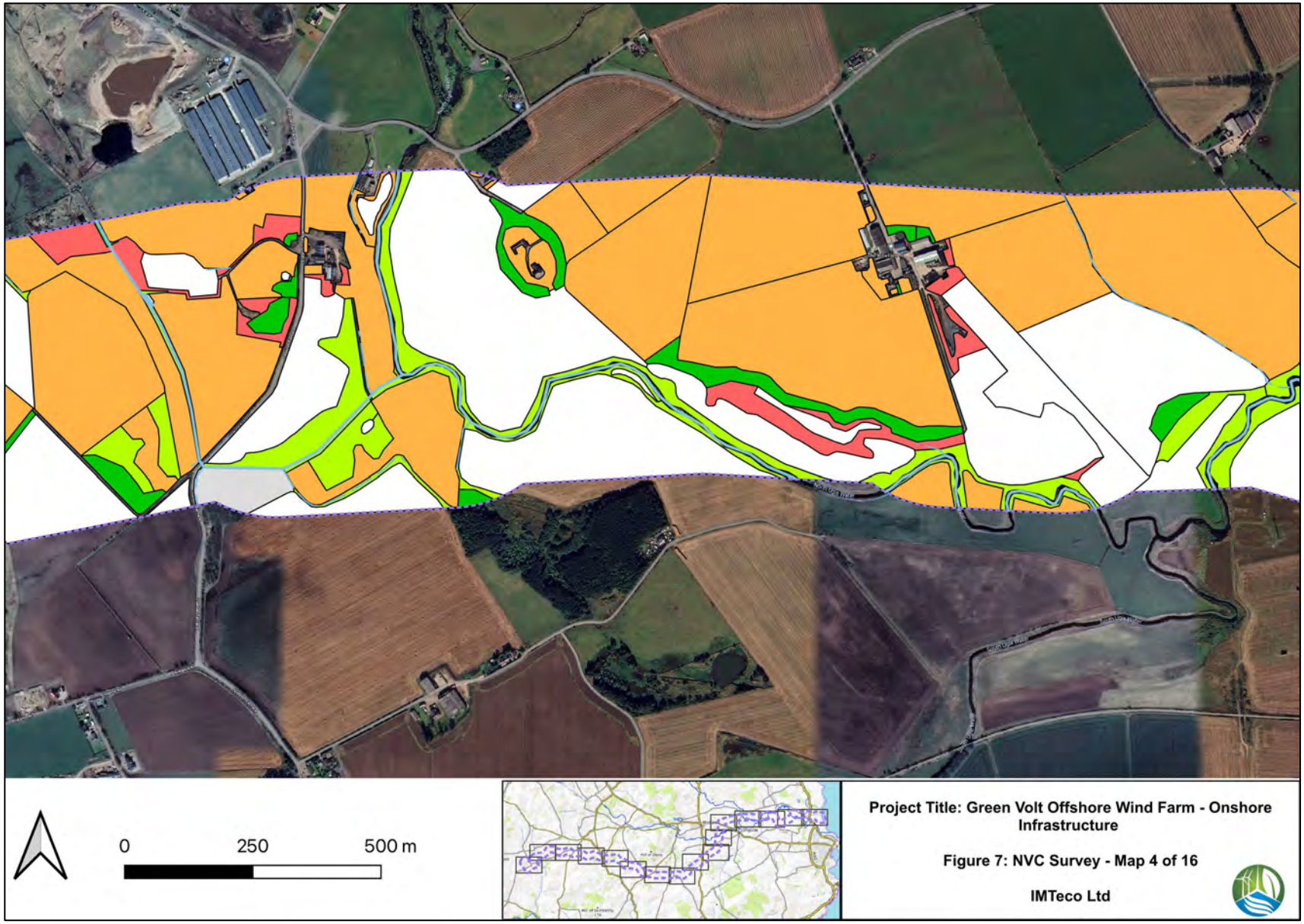
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Figure 7: NVC Survey - Map 4 of 16
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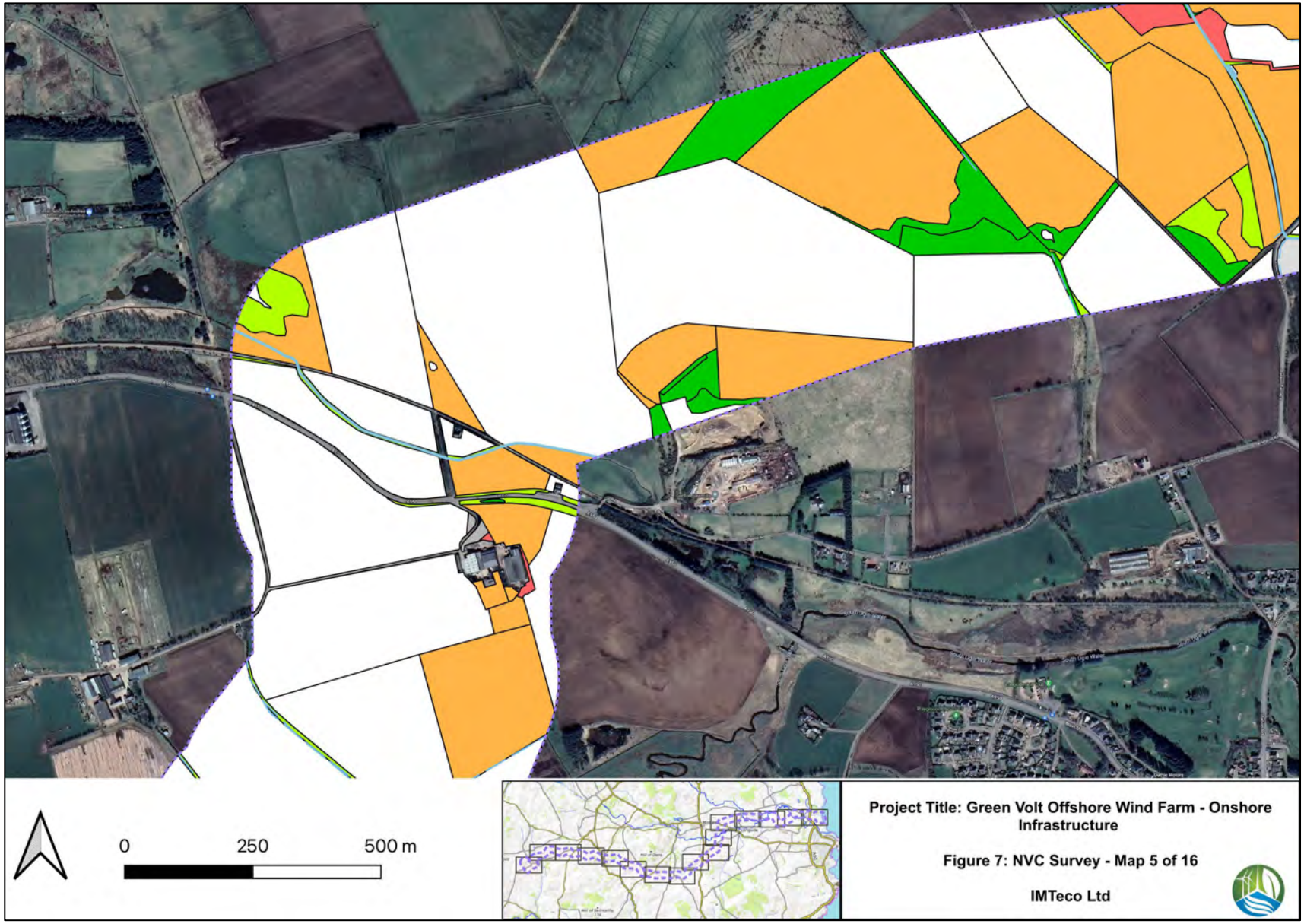
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Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 7: NVC Survey - Map 5 of 16
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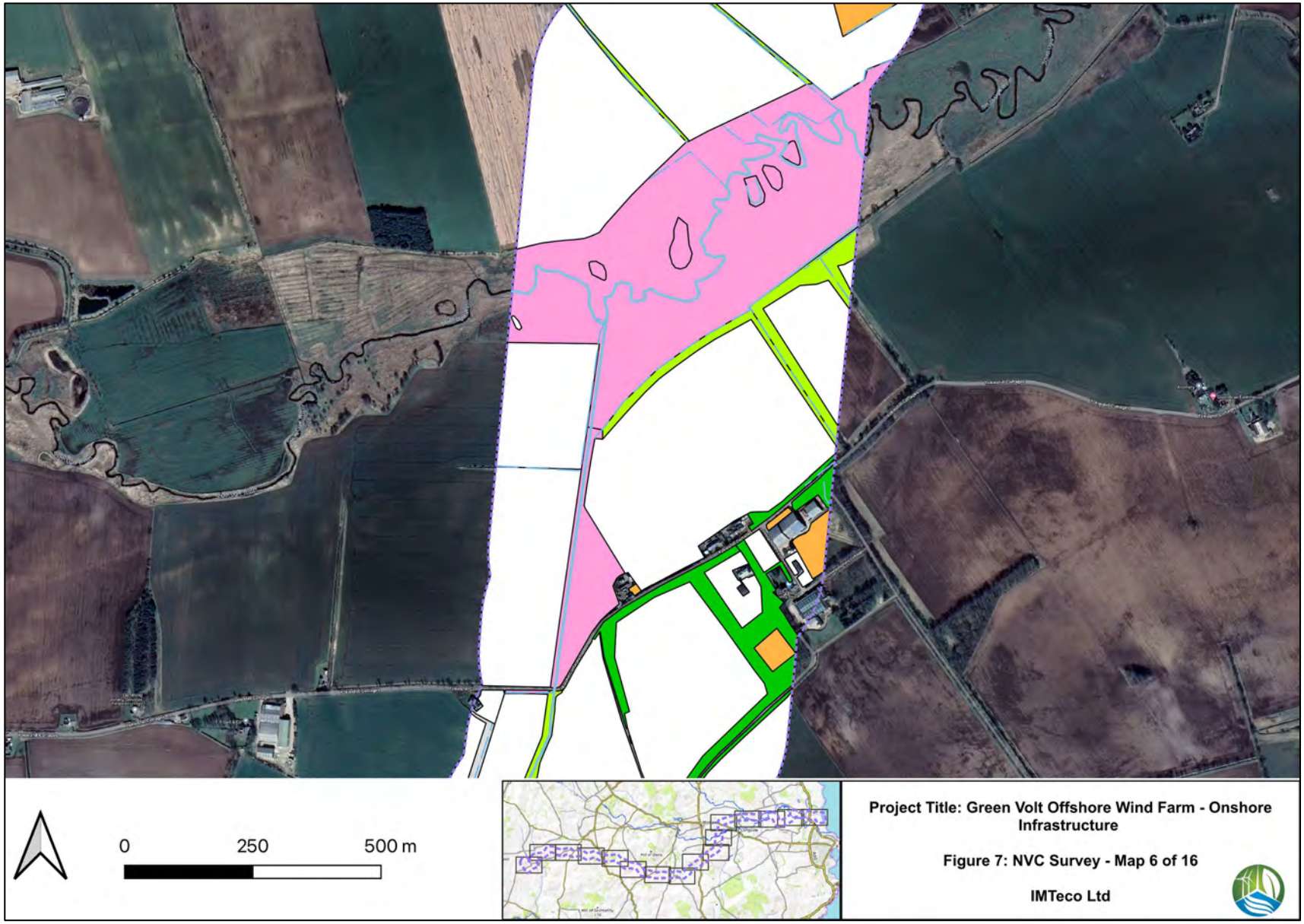
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Figure 7: NVC Survey - Map 6 of 16
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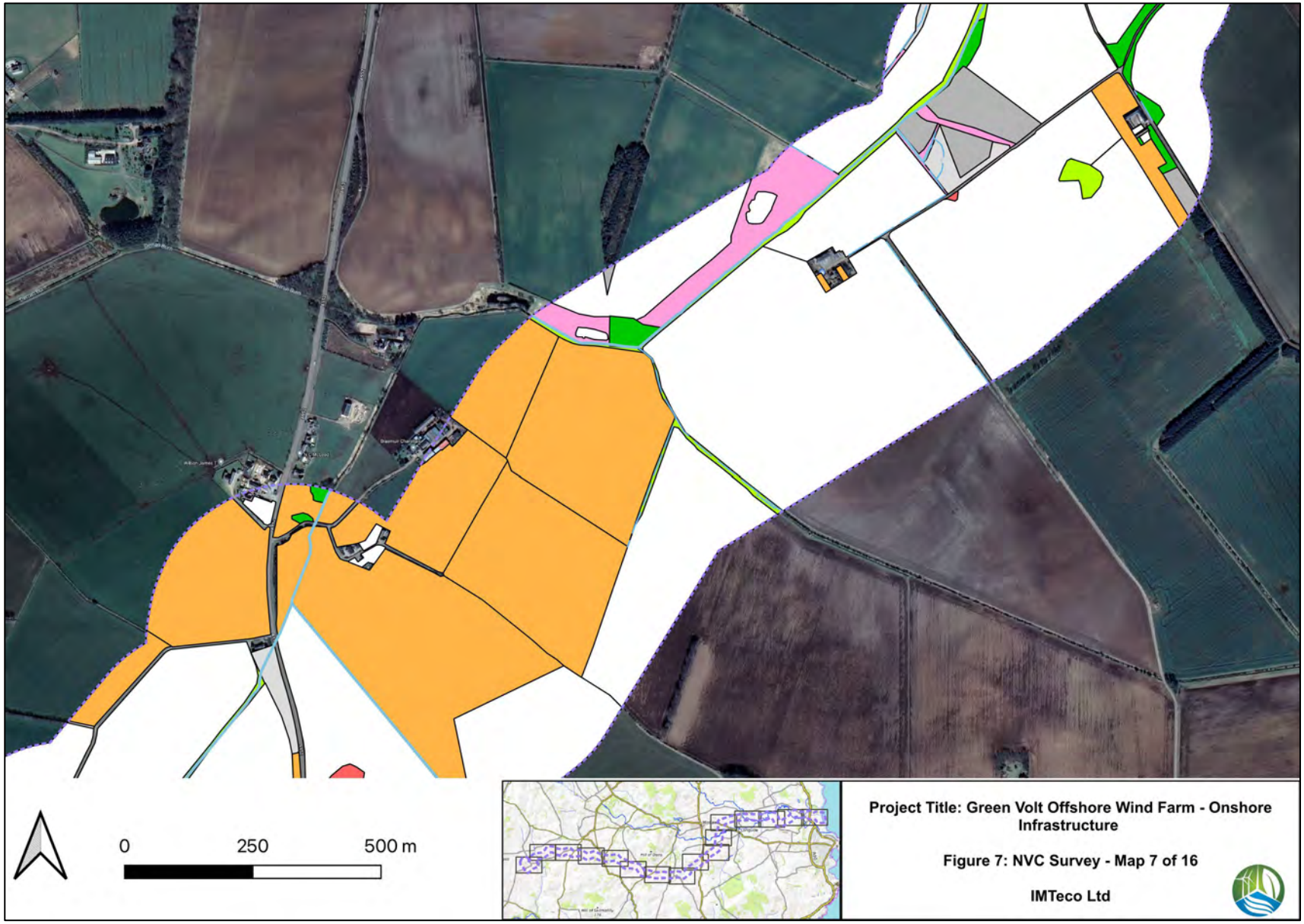
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Figure 7: NVC Survey - Map 7 of 16
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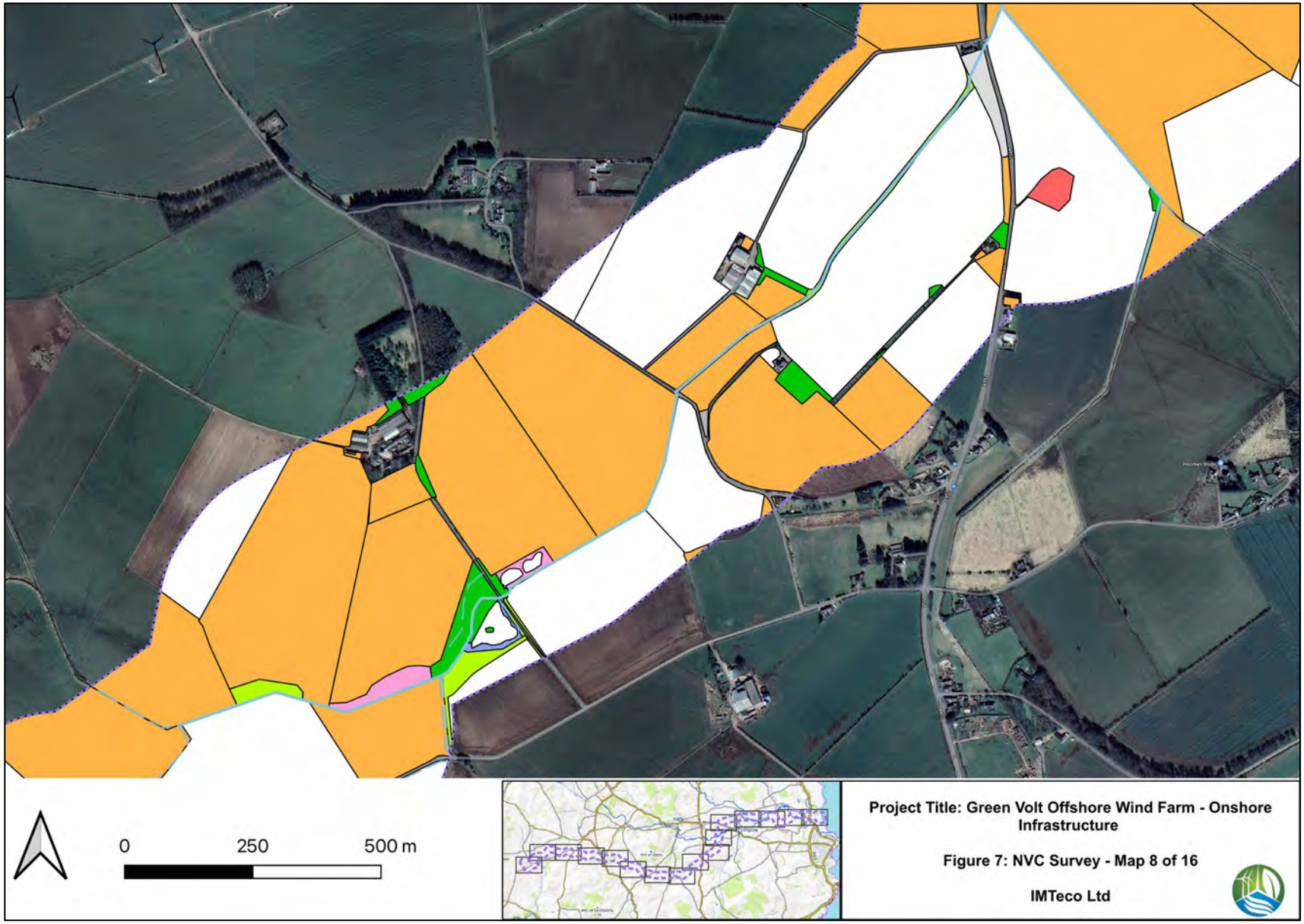
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Figure 7: NVC Survey - Map 8 of 16
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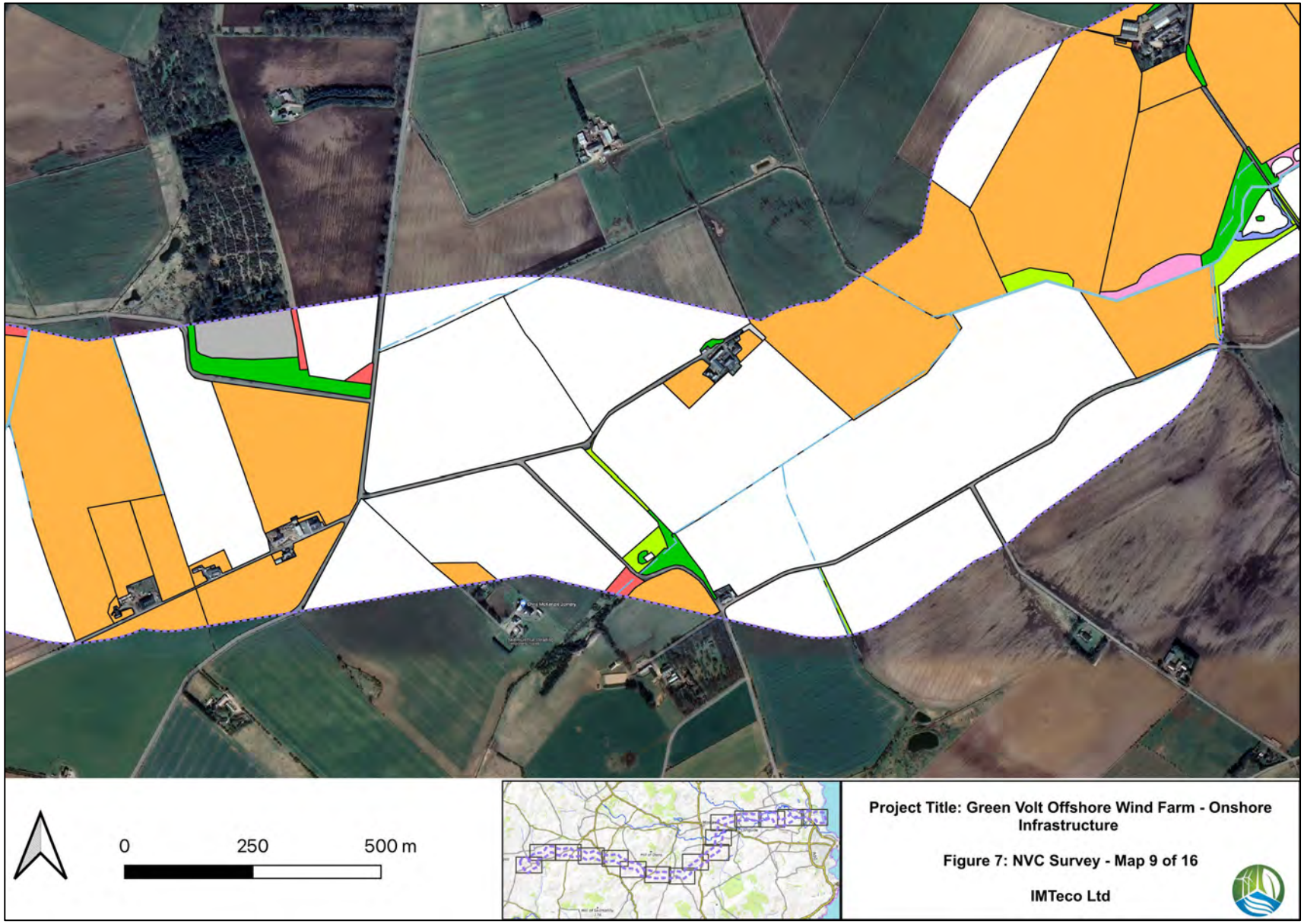
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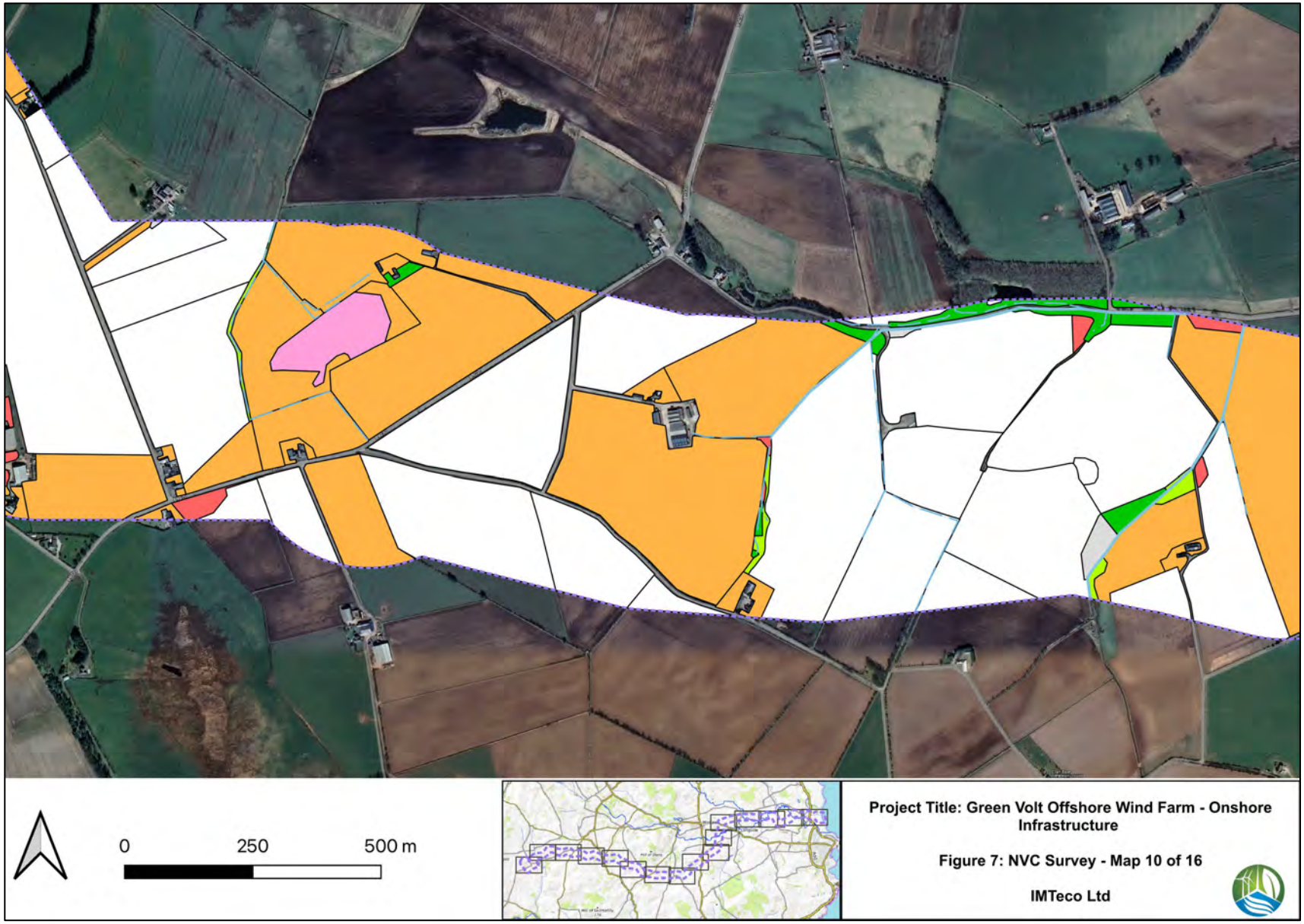
Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 7: NVC Survey - Map 9 of 16
IMTeco Ltd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Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 7: NVC Survey - Map 10 of 16
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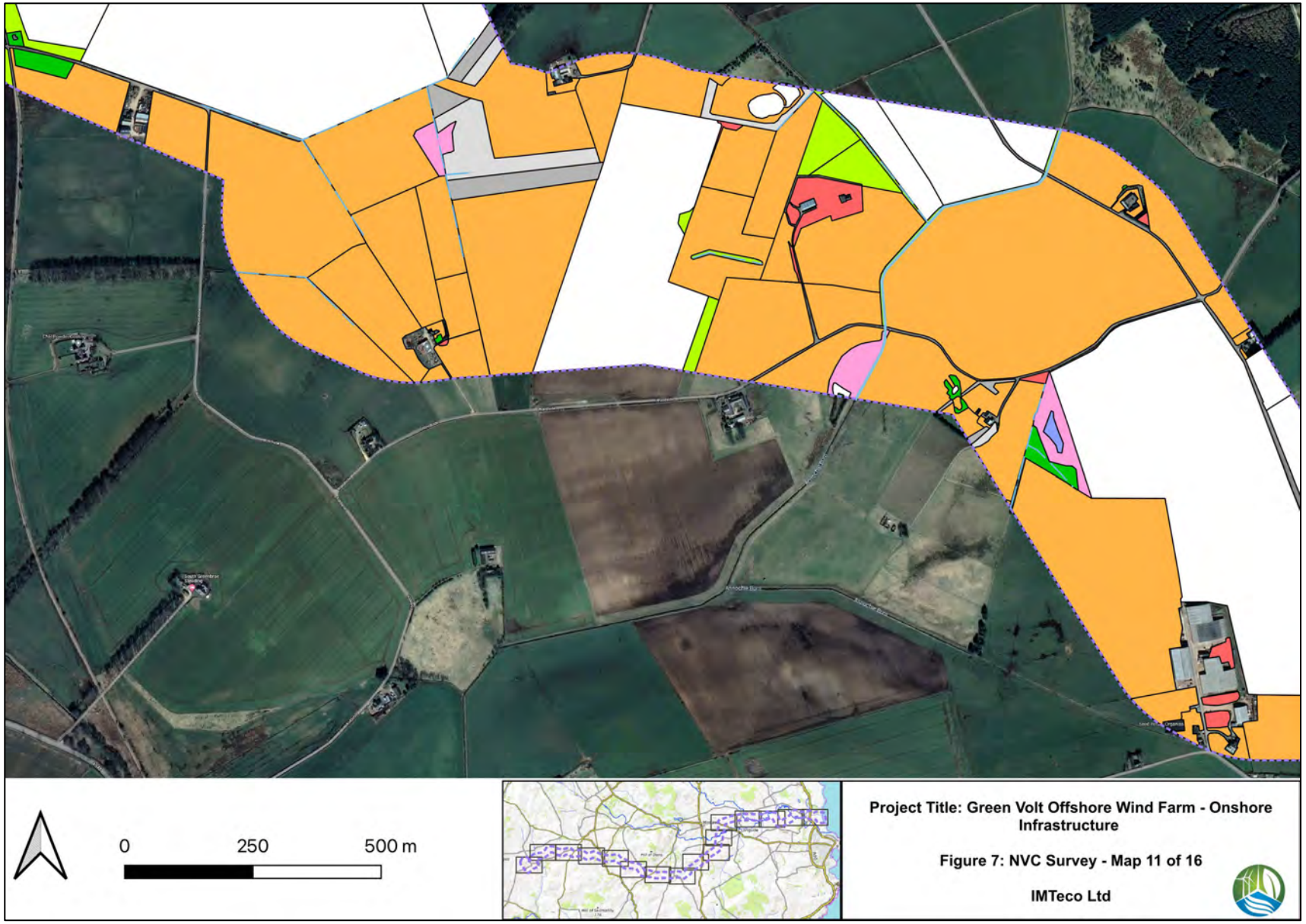
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Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 7: NVC Survey - Map 11 of 16
IMTeco Ltd

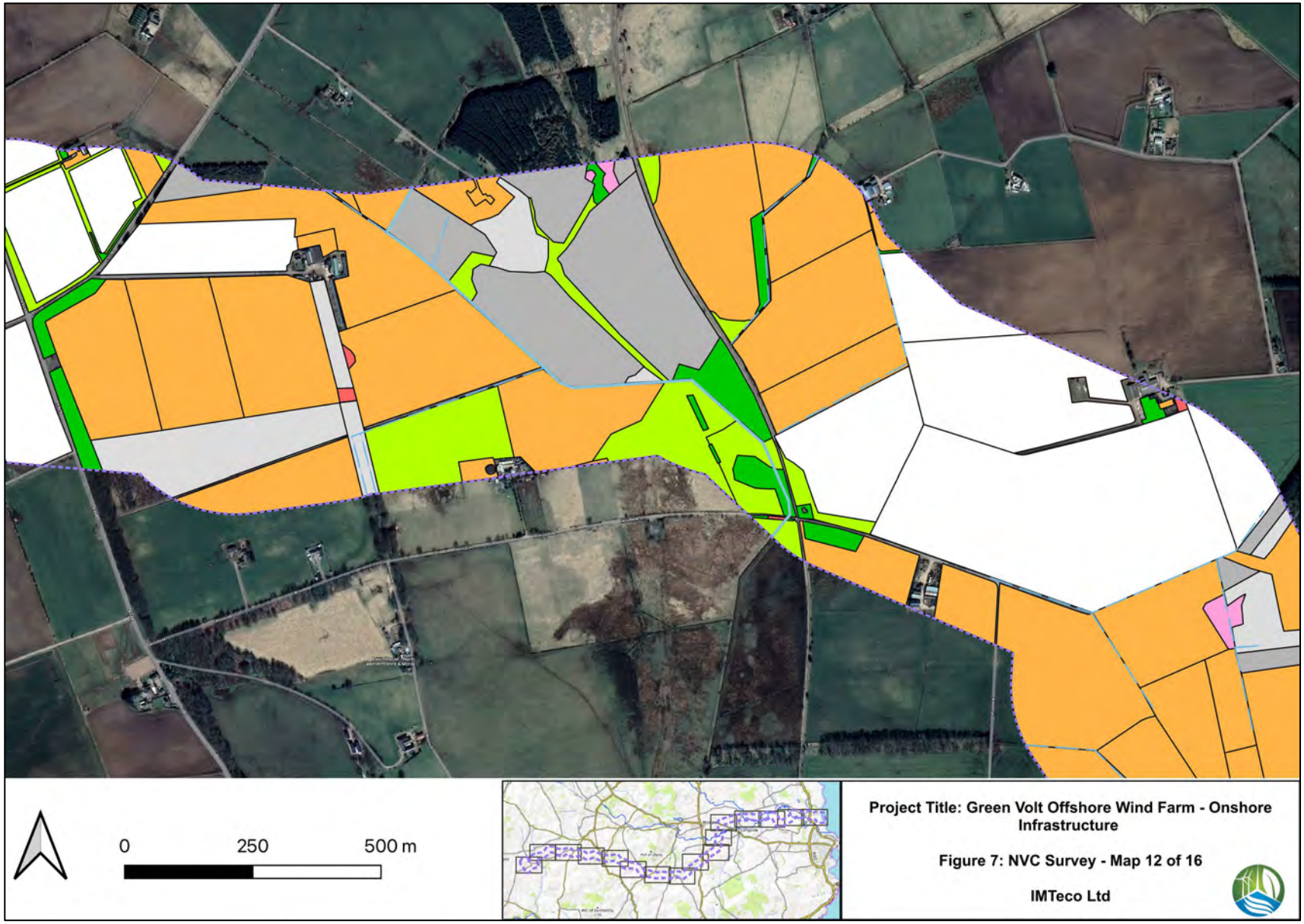
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Figure 7: NVC Survey - Map 12 of 16
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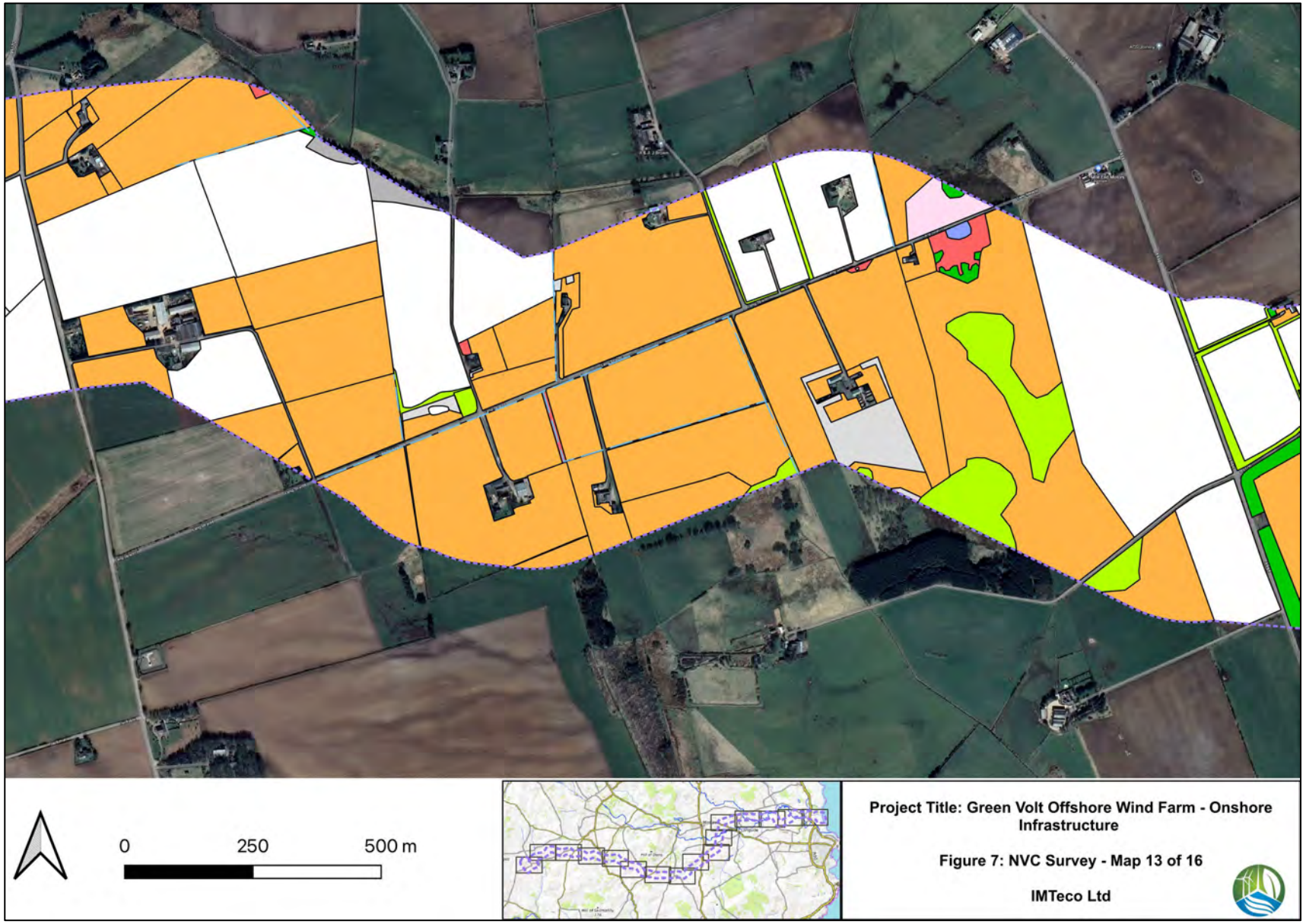
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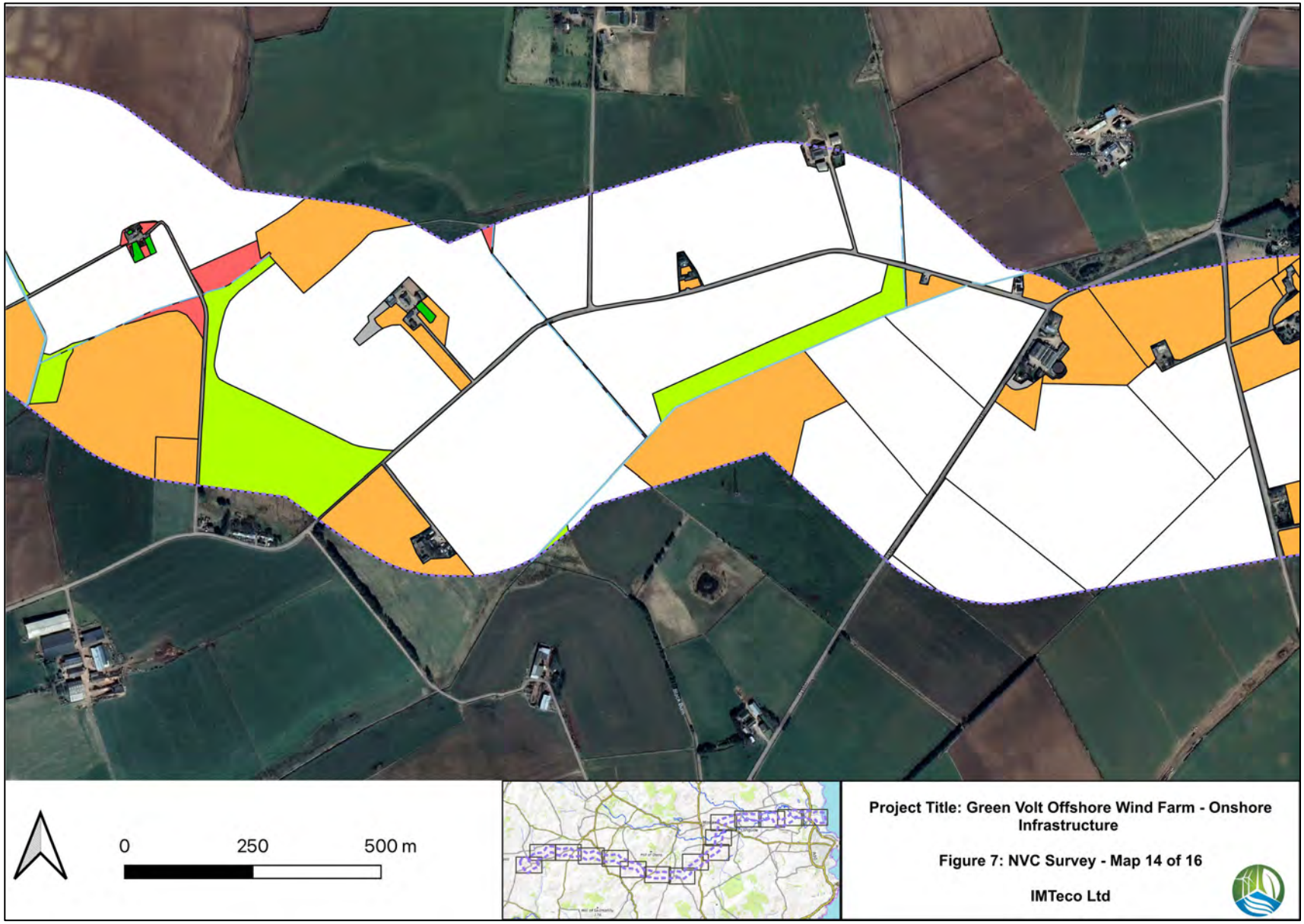
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Figure 7: NVC Survey - Map 14 of 16
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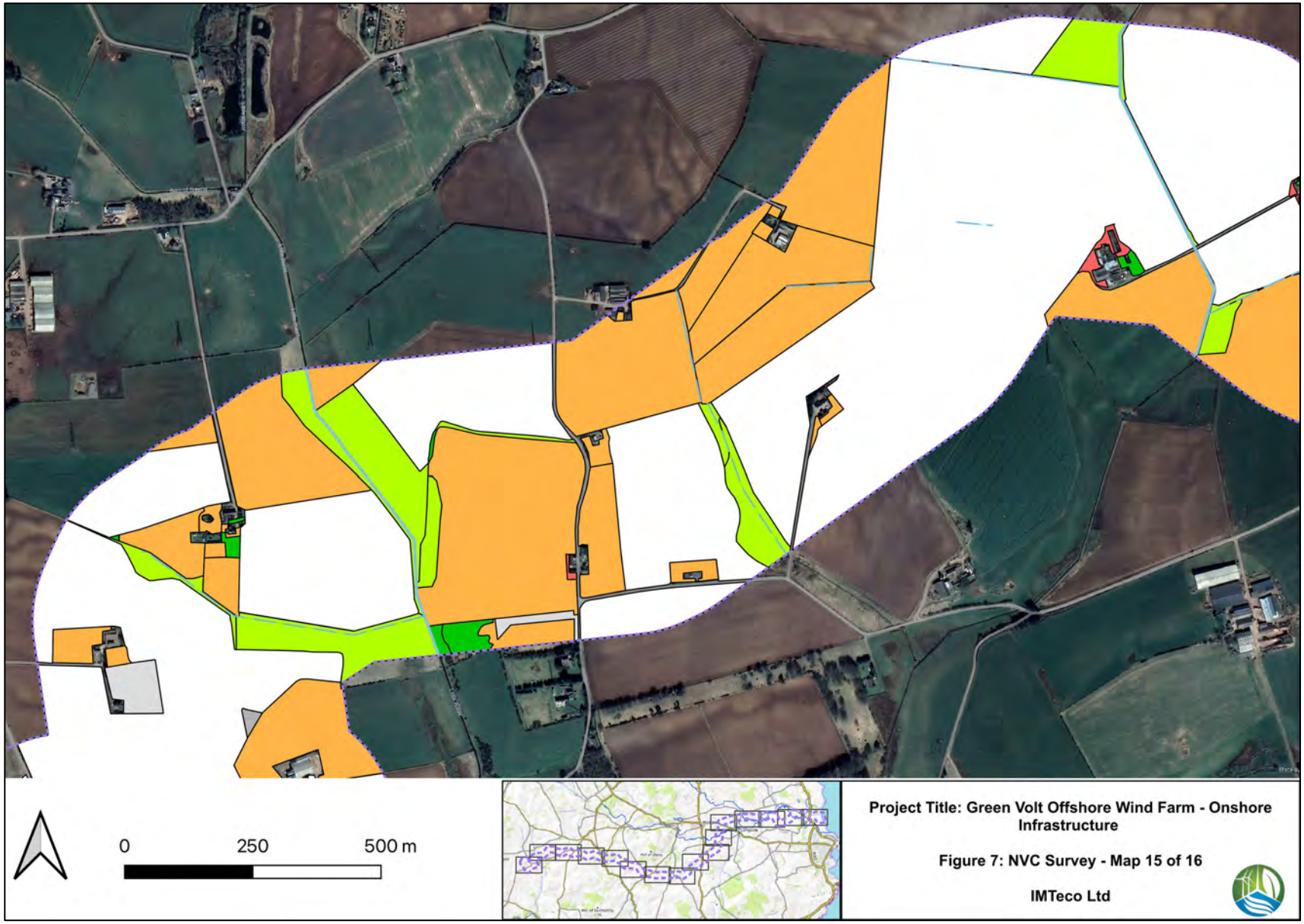
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Figure 7: NVC Survey - Map 15 of 16
IMTeco Ltd


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Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure
Figure 7: NVC Survey - Map 16 of 16
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Watercourses/Running water
250m ESA buffer
Google Terrain Hybrid

GWDTE Class 1
GWDTE Class 2
GWDTE Class 3

Project Title: Green Volt Offshore Wind Farm - Onshore Infrastructure

GWDTE Legend (Figure 8: Maps 1 - 4)

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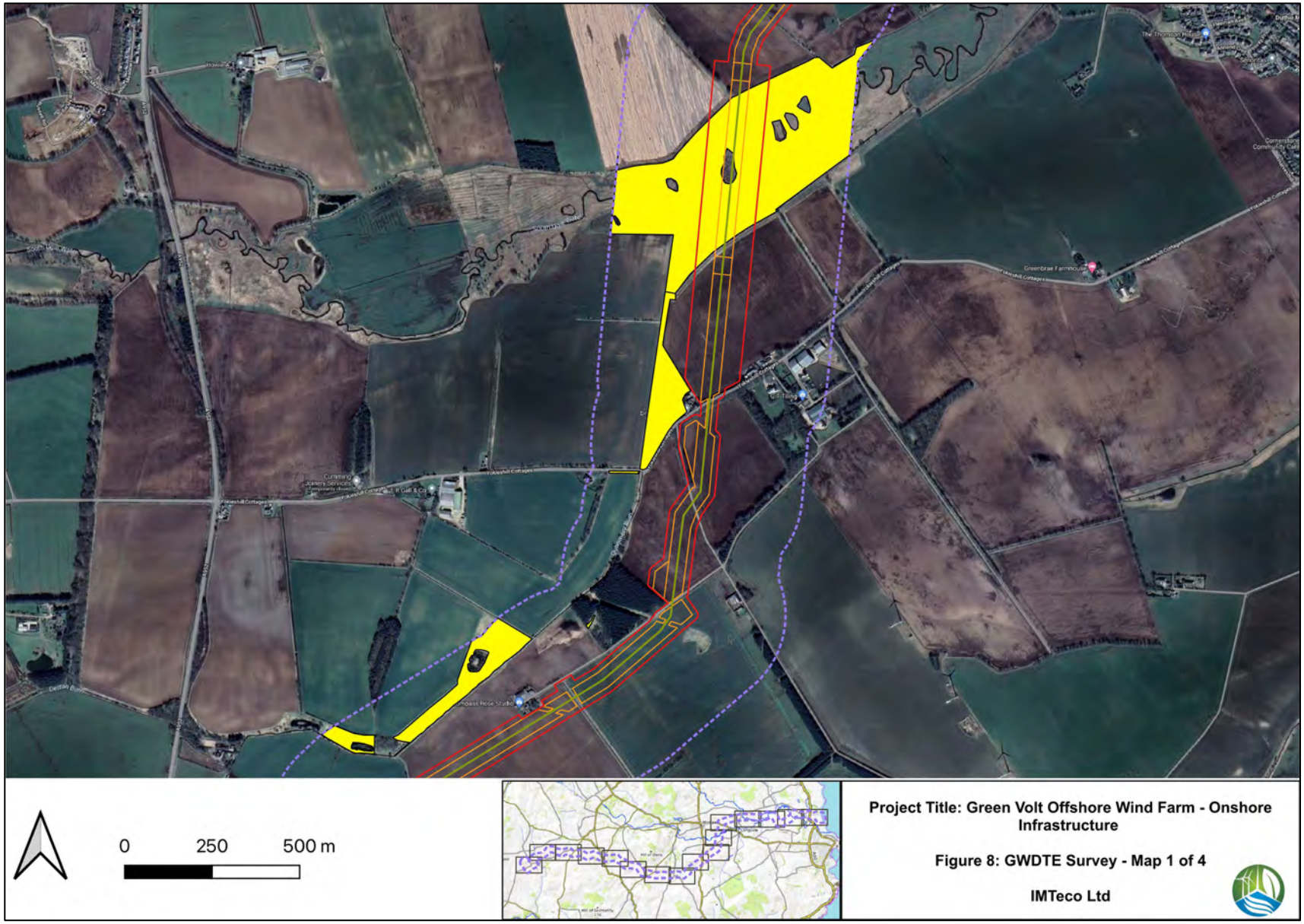
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Figure 8: GWDTE Survey - Map 1 of 4
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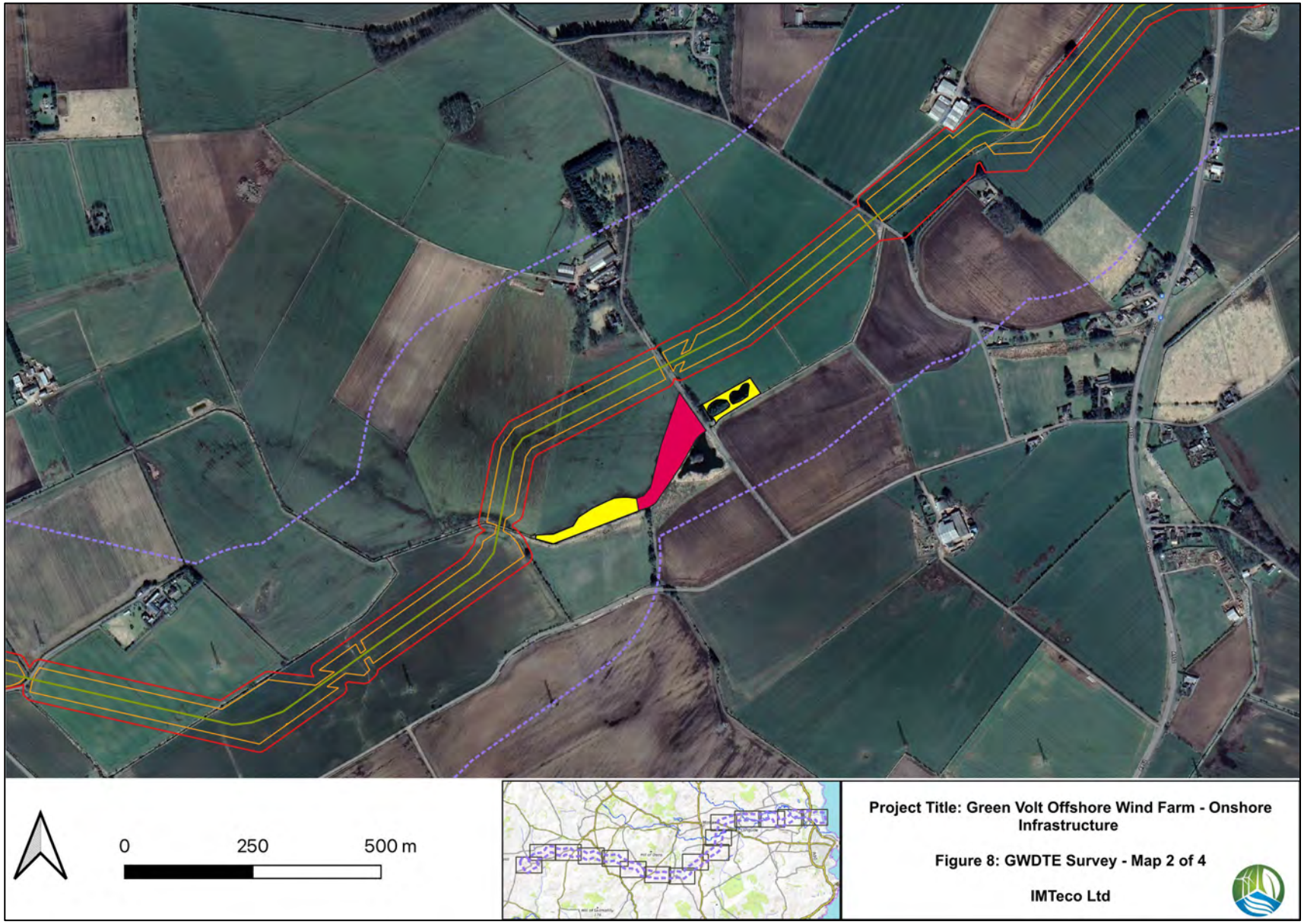
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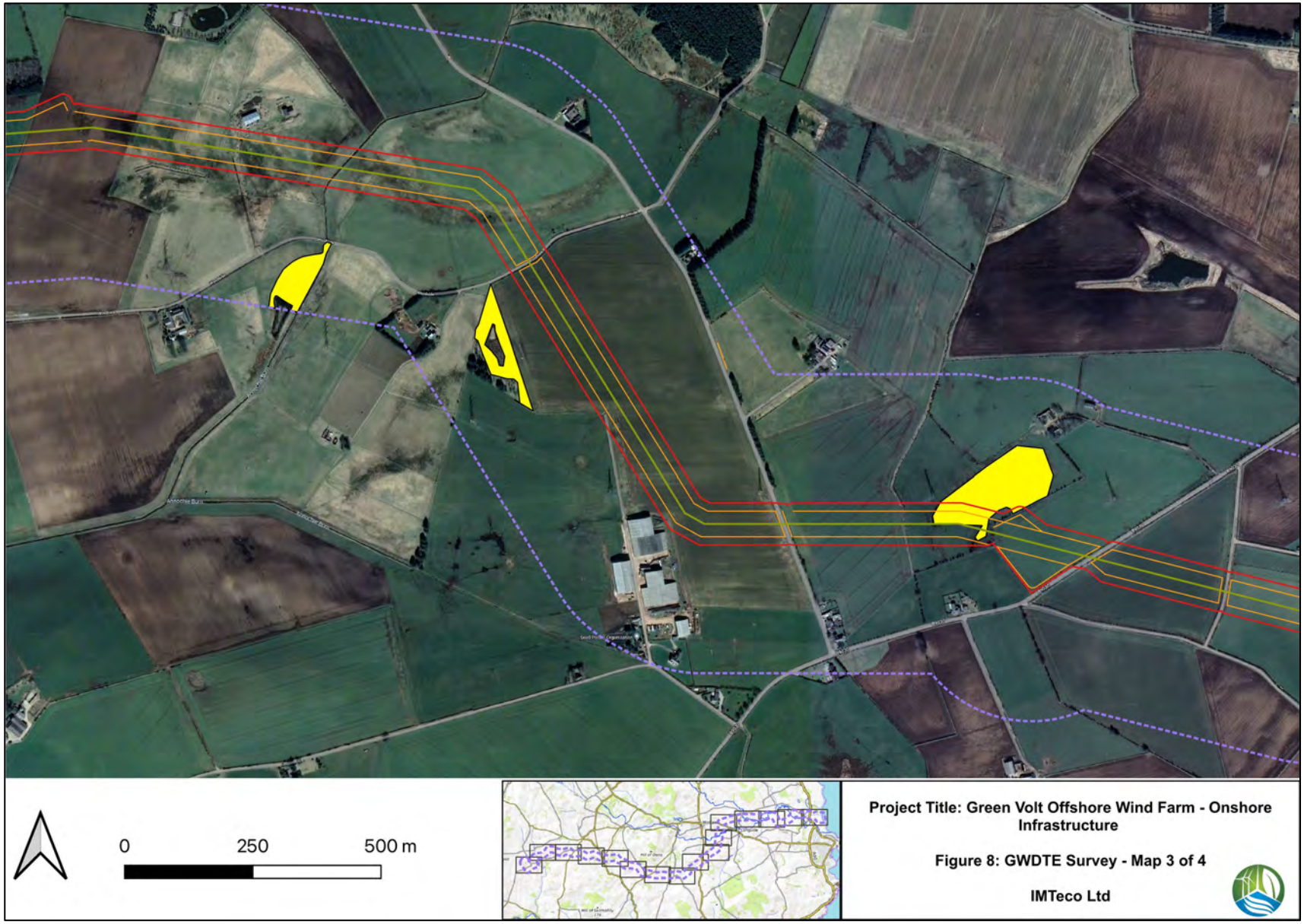
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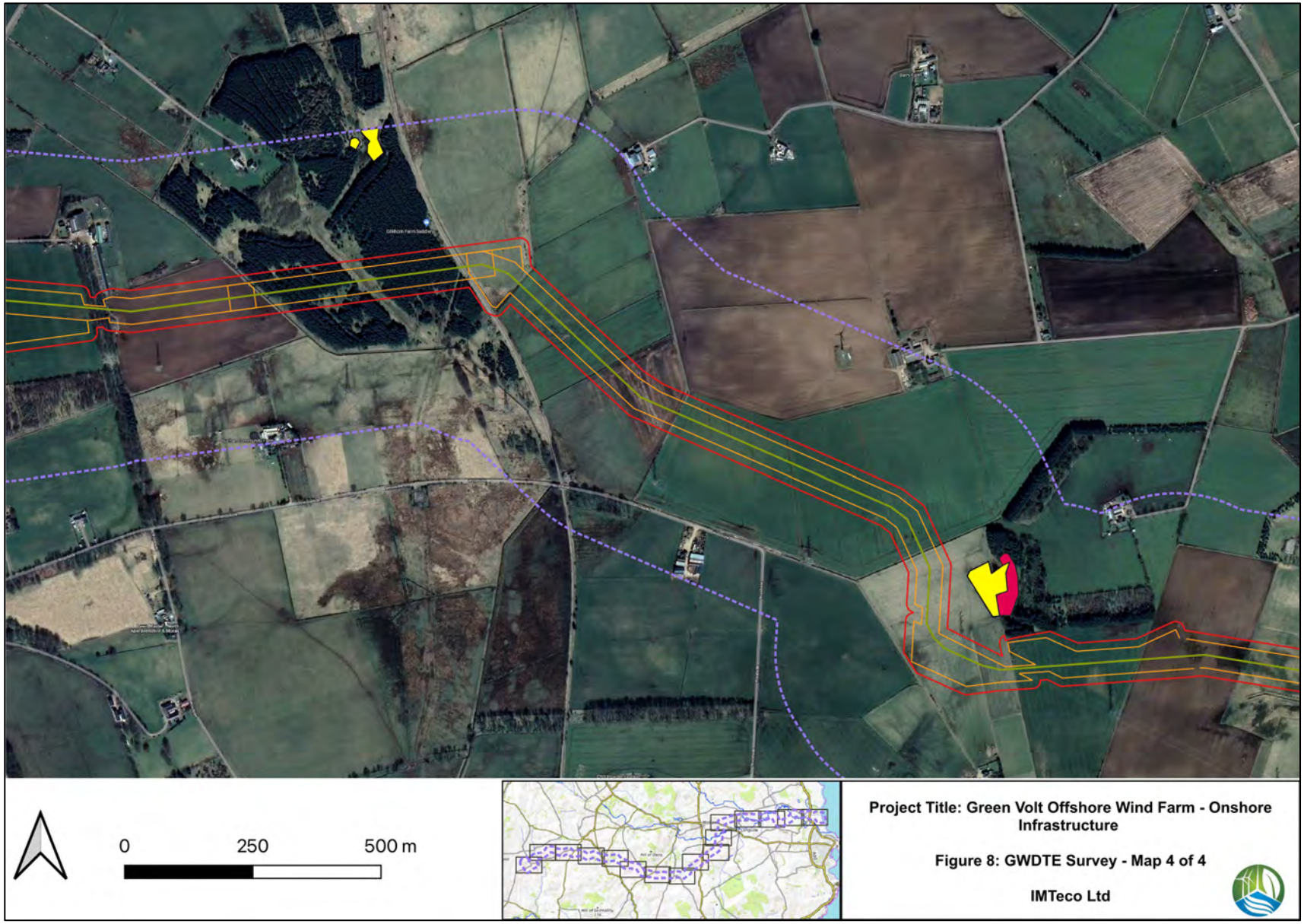
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Figure 8: GWDTE Survey - Map 4 of 4
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**Figure 9. Typical broadleaved trees located within the ESA.**

**Figure 10. Abundant gorse scrub and hedge within the ESA.**

**Figure 11. A modified grassland field located within the ESA.**

**Figure 12. A grassland field with impeded drainage and areas of scattered soft rush (*Juncus effusus*). NVC communities associated with this type of habitat is MG10a.**

**Figure 13. An M23 community also located in areas that was wet under foot with a high-water table.**

**Figure 14. Open vegetation habitat which was located throughout the ESA mainly located on disturbed ground, field margins and watercourses in small pockets of unmanaged grassland.**

**Figure15. A section of the River Ugie in proximity to a proposed trenchless crossing point.**

**Figure 16. The River Ugie at a proposed trenchless crossing point.**

**Figure 17. Typical straightened watercourse (the Burn of Aesleid) located within the ESA.**

# APPENDIX A – POLICY AND LEGISLATION

| | Legislation or Guidance Document |
|---|---|
| **Legislation** | Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011[46], which transpose the EIA Direction into the Scottish planning system;<br>Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (The Habitats Directive)[47];<br>Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (Water Framework Directive)[48];<br>The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations), which transposes the Habitats Directive into UK law[49];<br>Environmental Impact Assessment Directive 85/337/EEC (the EIA Directive)[50];<br>The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017[51];<br>The Water Environment and Water Services (Scotland) Act 2003 (WEWS)[52];<br>The Water Environment (Controlled Activities) (Scotland) Regulations 2011[53][54], Amendment Regulations 2021[55];<br>The Wildlife and Countryside Act 1981 (as amended)[56];<br>Nature Conservation (Scotland) Act 2004 (as amended)[57];<br>The Wildlife and Natural Environment (Scotland) Act 2011[58]<br>The Protection of Badgers Act 1992[59] |
| **Policy** | Fourth National Planning Framework (NPF4)[60];<br>UK Post-2010 Biodiversity Framework (2012)[61]; |

[46] Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011: https://www.gov.scot/publications/planning-circular-3-2011-town-country-planning-environmental-impact-assessment/

[47] European Commission (1992) Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora ( The Habitats Directive)
https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN

[48] Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (Water Framework Directive); https://eur-lex.europa.eu/resource.html?uri=cellar:5c835afb-2ec6-4577-bdf8-756d3d694eeb.0004.02/DOC_1&format=PDF

[49] The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations), which transposes the Habitats Directive into UK law: https://www.legislation.gov.uk/uksi/1994/2716/contents/made

[50] Environmental Impact Assessment Directive 85/337/EEC (the EIA Directive: https://ec.europa.eu/environment/eia/eia-legalcontext.htm

[51] The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017; https://www.legislation.gov.uk/ssi/2017/101/contents/made

[52] The Water Environment and Water Services (Scotland) Act 2003 (WEWS); https://www.legislation.gov.uk/asp/2003/3/contents

[53] The Water Environment (Controlled Activities) (Scotland) Regulations 2011; https://www.legislation.gov.uk/ssi/2011/209/contents/made

[54] The Water Environment (Controlled Activities) (Scotland) Regulations 2011; A practical guide, Version 8.3 February 2019
https://www.sepa.org.uk/media/34761/car_a_practical_guide.pdf

[55] The Water Environment (Controlled Activities) (Scotland) Amendment Regulations 2021 https://www.legislation.gov.uk/ssi/2021/412/contents/made

[56] The Wildlife and Countryside Act 1981 (as amended); UK Government (1981) Wildlife and Countryside Act 1981, Chapter 69. Part 1:
http://www.legislation.gov.uk/ukpga/1981/69/section/1

[57] Nature Conservation (Scotland) Act 2004 (as amended); https://www.legislation.gov.uk/asp/2004/6/contents

[58] The Wildlife and Natural Environment (Scotland) Act 2011; https://www.legislation.gov.uk/asp/2011/6/contents

[59] The Protection of Badgers Act 1992; https://www.legislation.gov.uk/ukpga/1992/51/contents

[60] https://www.gov.scot/publications/scotland-2045-fourth-national-planning-framework-draft/

[61] UK Post-2010 Biodiversity Framework (2012); https://jncc.gov.uk/our-work/uk-post-2010-biodiversity-framework/

| | Legislation or Guidance Document |
|---|---|
| | Scottish Biodiversity Strategy: It's in Your Hands (2004)/2020 Challenge for Scotland's Biodiversity (2013)[62];<br>Scottish Government (2017). Planning Advice Note 1/2013-Environmental Impact Assessment, Revision 1.0[63];<br>PAN 51: Planning, Environmental Protection and Regulation (revised 2006)[64];<br>PAN 60: Planning for Natural Heritage (Scottish Government, 2000)[65]; and<br>Nature Conservation: Implementation in Scotland of the Habitats and Birds Directives: Scottish Executive Circular 6/1995 as amended (June 2000)[66] |
| **Guidance** | Averis et al., (2014). An Illustrated Guide to British Upland Vegetation. Joint Nature Conservation Committee. Peterborough;<br>Bang and Dahlstrøm. (2001). Animal Tracks and Signs. Oxford University Press, Oxford;<br>Chanin (2003a) Monitoring the Otter (*Lutra lutra*). Conserving Natura 2000 Rivers: Monitoring Series No. 10. English Nature, Peterborough;<br>Chanin (2003b). Ecology of the European Otter. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough;<br>CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.[67];<br>Collins, J.(ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)[68];<br>Cresswell et al., (2012). UK BAP Mammals Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. Published by The Mammal Society;<br>Croose, E., Birks, J.D.S., Schofield, H.W. & O'Reilly, C. (2014). Distribution of the pine marten (Martes martes) in southern Scotland in 2013. Scottish Natural Heritage Commissioned Report No. 740.<br>Dean et al., (2016). The Water Vole Mitigation Handbook. (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London;<br>DEFRA (2016). Understanding the Risk to European Protected Species (bats) at Onshore Wind Turbine Sites to inform Risk Management. University of Exeter;<br>European Commission (2011). Wind energy developments and Natura 2000[69];<br>European Commission (2011). EU Biodiversity Strategy[70];<br>Gurnell et al., (2009). Practical Techniques for Surveying and Monitoring Squirrels. Forestry Commission Scotland, Edinburgh; |

[62] Scottish Biodiversity Strategy: It's in Your Hands (2004)/2020 Challenge for Scotland's Biodiversity (2013); https://www.gov.scot/policies/biodiversity/scottish-biodiversity-strategy/

[63] Scottish Government (2017). Planning Advice Note 1/2013-Environmental Impact Assessment, Revision 1.0; https://www.gov.scot/publications/planning-advice-note-1-2013-environmental-impact-assessment/

[64] PAN 51: Planning, Environmental Protection and Regulation (revised 2006); https://www.gov.scot/publications/planning-advice-note-pan-51-revised-2006-planning-environmental-protection/

[65] PAN 60: Planning for Natural Heritage (Scottish Government, 2000); https://www.gov.scot/publications/pan-60-natural-heritage/

[66] Nature Conservation: Implementation in Scotland of the Habitats and Birds Directives: Scottish Executive Circular 6/1995 as amended (June 2000); https://www.gov.scot/binaries/content/documents/govscot/publications/foi-eir-release/2020/01/foi-201900008726/documents/foi-201900008726-information-released-a/foi-201900008726-information-released-a/govscot%3Adocument/FOI%2B-%2B201900008726%2B-%2BInformation%2Breleased%2B-%2BCircular%2B6-1995%2BNature%2BConservation%2B-%2B%2527The%2BHabitats%2Band%2BBirds%2BDirectives%2527%2B%2528Updated%2BJune%2B2000%2529..PDF

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[68] Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good practice Guidelines (3rd edition). The Bat Conservation Trust, London: https://www.bats.org.uk/resources/guidance-for-professionals/bat-surveys-for-professional-ecologists-good-practice-guidelines-3rd-edition

[69] European Commission (2011). Wind energy developments and Natura 2000: https://ec.europa.eu/environment/nature/info/pubs/docs/leaflets/windfarm/en.pdf

[70] European Commission. (2011). EU Biodiversity Strategy. http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm

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| | Harris S., Cresswell P and Jefferies D., (1989). Surveying Badgers. The Mammal Society, London;<br>Harris and Yalden. (2008). Mammals of the British Isles: Handbook. , 4th Edition. The Mammal Society, Southampton;<br>Hundt (2012). Bat Surveys: Good Practice Guidelines (2nd Edition), BCT, London;<br>Joint Nature Conservation Committee (2013). Guidelines for selection of biological Sites of Special Scientific Interest (SSSI);<br>Joint Nature Conservation Committee (2004) Common Standards Monitoring Guidance for Reptiles and Amphibians, Version February 2004. JNCC, Peterborough;<br>Rodwell (2006). National Vegetation Classification: Users' handbook;<br>Scottish Government (2013). Scottish Biodiversity List[71];<br>Scottish Executive (2001) (updated 2006). European Protected Species, Development Sites and the Planning System: Interim guidance for local authorities on licensing arrangements;<br>Scottish Executive Rural Affairs Department (SERAD) (2000). Habitats and Birds Directives, Nature Conservation: Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the Conservation of Wild Birds (''The Habitats and Birds Directives''). Revised Guidance Updating Scottish Office Circular No 6/1995;<br>Scottish Environment Protection Agency (SEPA) (2017) Guidance Note 4 - Planning guidance on on-shore windfarm developments (Issue 9)[72];<br>Scottish Environment Protection Agency (SEPA) (2017). Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (Version 3)[73];<br>Scottish Natural Heritage (Version 2, 2016). Planning for Development: What to consider and include in Habitat Management Plans[74];<br>Scottish Natural Heritage (2003). Best Practice Guidance - Badger Surveys. Inverness Badger Survey 2003. Commissioned Report No. 096;<br>Scottish Natural Heritage (2018). Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland[75];<br>Strachan et al., (2011). The Water Vole Conservation Handbook;<br>The Herpetological Conservation Trust (2007). National Amphibian and Reptile Recording Scheme, Habitat Recording Guide;<br>BS 42020:2013 Biodiversity: Code of Practice for Planning and Development: BSI Standards Publication.<br>Scottish Natural Heritage (2012). Assessing the Cumulative Impact of Onshore Wind Energy Developments[76]; |

[71] Scottish Government. (2013). Scottish Biodiversity List. https://www2.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL

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[73] Scottish Environment Protection Agency (SEPA) (2017) Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (Version 3); https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf

[74] Scottish Natural Heritage (Version 2, 2016). Planning for Development: What to consider and include in Habitat Management Plans; https://www.nature.scot/sites/default/files/2019-01/Guidance%20-%20Planning%20for%20development%20%20-%20What%20to%20consider%20and%20include%20in%20Habitat%20Management%20Plans.pdf

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[76] Scottish Natural Heritage (2012). Assessing the Cumulative Impact of Onshore Wind Energy Developments; https://www.nature.scot/sites/default/files/2019-11/Guidance%20-%20Assessing%20the%20cumulative%20impact%20of%20onshore%20wind%20energy%20developments.pdf

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[77] Scottish Natural Heritage (2016). General Pre-application/ Scoping Advice to Developers of Onshore Wind Farms: NatureScot. (2020). General pre-application/ scoping advice to developers of onshore wind farms: https://www.nature.scot/general-pre-application-and-scoping-advice-onshore-wind-farms

[78] The Scottish Government (2019): Scotland's Forestry Strategy: https://www.gov.scot/publications/scotlands-forestry-strategy-20192029/

GREEN VOLT

# Appendix 6.2

## Protected Species Survey

Onshore EIA Report: Volume 3

IMTeco Ltd

# Appendix 6.2:
# Protected Species Surveys

## Green Volt Onshore Infrastructure
## Cable Route Infrastructure
## Peterhead to New Deer
## Aberdeenshire.

July 2023

IMTeco Ltd

# Notes:

Site: Green Volt Onshore Infrastructure, Peterhead to New Deer
Client: Green Cat Renewables Ltd
Date: 08/08/2023
Status: Final

| Version | Date | Author | Checked | Approved |
|---|---|---|---|---|
| Draft | 15/06/2023 | I Tierney | Y | |
| Final | 01/08/2023 | I Tierney | Y | |
| | | | | |
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# CONTENTS

# 1 INTRODUCTION

## 1.1 Introduction

The Offshore Project is being proposed and intended to be operational by 2026. Generated power will be exported by means of a subsea cable that will landfall on the East Scottish coast north of Peterhead, at the approximate location of NK 11423 49014, before heading west to a new Substation to be built at New Deer. The Onshore Infrastructure associated with the Offshore Project includes; the Landfall, the Cable Route Corridor, and the Substation Compound. The onshore cables are to be generally laid in an open cut trench (i.e., excavating down to required depth, installing the duct, and then backfilling), except where there are geographical or environmental constraints that would prohibit open cut trenching. At these locations, it is intended to use trenchless techniques.

## 1.2 Purpose of this Report

This report describes methods and results of Protected Species Surveys undertaken between October 2022 to June 2023 to obtain baseline ecological information, to inform the Ecological Impacts Assessment (EcIA) for the Proposed Development from the landfall point at Peterhead to New Deer Substation (Figure 1). Surveys for specific species were undertaken at the appropriates seasons or months as recommended in guidance by NatureScot[1][2].

This report has been undertaken in accordance with the 'Guidelines for Ecological Impact Assessment in the UK' (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018)[3].

The aim of the Protected Species surveys was to obtain baseline information regarding the occurrence and distribution of protected species within the Ecological Survey Area (ESA) to provide an accurate and robust baseline on which to base the Ecological Impacts Assessment. The following terminology is used throughout:

- The Proposed Development: Onshore cable route;
- The Site: is the area within which all new infrastructure shall be contained; and

[1] https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms
[2] https://www.nature.scot/doc/standing-advice-planning-consultations-birds
[3] https://cieem.net/wp-content/uploads/2019/02/Combined-EclA-guidelines-2018-compressed.pdf

- Ecology Survey Area (ESA): is the area in which ecological surveys were undertaken, up to 250m.

## 1.3 Ecological Context

The cable route corridor between Peterhead and New Deer extends for approximately 27km though predominantly agricultural crop and grazing fields normally lineated by hedgerows and tree lines. Multiple design meetings have established a route that avoids woodland where possible including both residential and farm buildings. Within the wider area there are farm fields, commercial conifer plantations, deciduous and mixed woodland, scrub, hedges, quarries, ditches, watercourses and urban settlements.

## 1.4 Policy & Legal Context

Guidance for assessing the potential impact of the Proposed Development on the ecological features of the development site will be based on the following statutory, general, and national guidance listed in Appendix A. Any appropriate local policy and guidance will also be considered.

# 2 METHODS

## 2.1 Background Data Search

### 2.1.1 Protected Species

To provide historical and local context to the EcIA, existing records of protected and/or notable species were sought up to and within a 2 km radius of the Site. This information was obtained from the following:

- NatureScot SiteLink[4];
- National Biodiversity Network (NBN)[5];
- Scottish Wildlife Trust;
- Scotland's Environment Map;
- North East Scotland Biological Records Centre (NESBReC); and
- Public meetings with landowners.

### 2.1.2 Designated Sites

The desk study aimed to identify statutory designated sites of ecological conservation interest within 2km of the Application Site Boundary and for any reference materials relating to the ecology of the site. A list of data sources is given in Table 1.

**Table 1: Data sources.**

| Information Obtained | Available From |
|---|---|
| Designated site locations and citations/Protected areas | SiteLink Nature.scot (https://sitelink.nature.scot/map) |
| Designated site locations and citations | Scottish Natural Heritage/Nature.scot (https://www.nature.scot) |
| Designations and legal protection of noteworthy species | Joint Nature Conservation Committee (JNCC: https://jncc.gov.uk) |
| Geographic information about the natural environment | Magic Map DEFRA (https://magic.defra.gov.uk/home.htm) |
| Ancient Woodland Inventory, Commercial Plantation Plans | Scottish Forestry (https://forestry.gov.scot/ https://forestry.gov.scot/support-regulations/scottish-forestry-map-viewer) |
| Native Woodland Survey Scotland | Scotland's Environment (https://www.environment.gov.scot) |

[4] https://sitelink.nature.scot/home

[5] https://nbn.org.uk/

| Information Obtained | Available From |
|---|---|
| | Magic Map (https://magic.defra.gov.uk/home.htm) |
| Scottish Wildlife Trust | https://scottishwildlifetrust.org.uk |
| River Quality & Catchments | Scotland's Environment (https://www.environment.gov.scot) |
| Aberdeenshire Local Development Plan 2023 | https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2023/ (https://storymaps.arcgis.com/stories/27f01f5e60544ece88580ca32dc4beb5) and Development Plan Scheme 2023 (https://www.aberdeenshire.gov.uk/media/27636/development-plan-scheme-2023.pdf) Aberdeenshire Coastal Zone (https://online.aberdeenshire.gov.uk/ldpmedia/LDP2021/Appendix5CoastalZone.pdf) Aberdeenshire Local Nature Conservation Sites (https://online.aberdeenshire.gov.uk/ldpmedia/LDP2021/Appendix12LocalNatureConservationSites.pdf) |
| Aberdeenshire Nature Conservation | https://www.aberdeenshire.gov.uk/environment/natural-heritage/biodiversity/#:~:text=Policy%20P1%20of%20the%20Aberdeenshire,the%20scale%20of%20the%20development. |
| North East Scotland Biodiversity Partnership | https://www.nesbiodiversity.org.uk (c/o The James Hutton Institute) |
| Aberdeenshire Council Pollinator Action Plan 2022 to 2027 | https://www.aberdeenshire.gov.uk/media/27229/pollinatoractionplan.pdf |
| Biological Data Records | NESBReC, Natural Environment Team, Aberdeenshire Council (https://nesbrec.org.uk/) |

A search was made for information on statutory designated sites (Internationally and Nationally important sites for ecology) within 2 km of the Application Site Boundary and non-statutory designated sites (important in a local context) within 1 km (Figure 2). A search was also made for records of noteworthy species within 2 km of the Application Site Boundary . Species included in the search parameters were:

- European Protected Species (listed on Schedule 2 and 4 of the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended);
- Nationally Protected Species under Schedules 1, 5 and 8 of The Wildlife & Countryside Act 1981 as amended by The Wildlife and Natural Environment (Scotland) Act 2011 and The Protection of Badgers Act 1992;

These species receive protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

- Species listed as critically endangered, endangered or vulnerable on the *IUCN Red List*[6];
- Nationally rare or nationally scarce species;
- Notable invertebrates; and
- Notable Species that have action plans under the Scottish Biodiversity List (SBL[7]) or are priority species under the Local Biodiversity Action Plan.

## 2.2 Field Surveys

Protected Species surveys were undertaken and supervised by Irene Tierney & Dr Garry Mortimer, Principal Ecologists and full members of the Chartered Institute of Ecology and Environmental Management (MCIEEM), and encompassed all land within the Site, in line with current NatureScot guidance[8]. During the protected mammal surveys the following species were specifically targeted, with species-specific buffers included for the surveys, according to survey guidelines and best practise, and termed Ecology Survey Area (ESA):

- Badger (*Meles meles*): Suitable habitats within the Site and extending up to 100m from the Site[9];
- Otter (*Lutra lutra*): Suitable habitats to be surveyed within the Site, extending up to 200m of suitable habitats potentially impacted by the proposed development[10][11][12];
- Water Vole (*Arvicola amphibious*): The survey area includes all suitable habitat within the Site, and within a 200m buffer to be surveyed where possible (access

[6] IUCN Red List: https://www.iucnredlist.org

[7] Scottish Biodiversity List: https://www.nature.scot/doc/scottish-biodiversity-list

[8] NatureScot: Planning and development: protected species; https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-protected-species

[9] NatureScot (2001) Scotland's Wildlife: Badgers and Development [Online] Available at: http://www.badgerland.co.uk/help/snh_badgers_develop.pdf

[10] Chanin (2003a) Monitoring the Otter (Lutra lutra). Conserving Natura 2000 Rivers: Monitoring Series No. 10. English Nature, Peterborough;

[11] Chanin (2003b) Ecology of the European Otter. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough

[12] NatureScot (2020). Protected Species Advice for Developers: Otter. Available at: https://www.nature.scot/species-planning-advice-otter

permitting), and extending up to 50m up and downstream of any watercourses or ditch systems potentially impacted by the proposed development[13] [14];

- Red Squirrel (*Sciurus vulgaris*): Suitable habitats to be surveyed within the Site, involving visual surveys and transects, with distances as per Gurnell, J. and P.W.W. Lurz (2012, page 9)[15].
- Pine Marten (*Martes martes*): The survey includes a systematic search for signs of pine marten presence and potential den sites within the proposed development following methodology set out in Cresswell et al. (2012)[16];
- Brown Hare (*Lepus europaeus*): Suitable habitats within the Site and extending up to 200m from the Site, following methodology set out in Cresswell et al. (2012)[17]; and
- Bats – Potential Roost Assessments of structures that were in the site corridor and were potentially to be removed were undertaken using guidance from the Bat Conservation Trust (BCT).

[13] Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London

[14] Strachan, R., Moorhouse, T. & Gelling, M. (2011). The Water Vole Conservation Handbook. Third Edition. Wildlife Conservation Research Unit, University of Oxford, Abingdon

[15] Gurnell, J. and P.W.W. Lurz (2012, page 9) Red Squirrel. In: Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trewhella, W.J., Wells, D. and Wray, S. (2012). UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southampton.

[16] Birks, J. (2012) Pine marten. In: Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trewhella, W.J., Wells, D. and Wray, S. (2012). *UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation.* The Mammal Society, Southampton.

[17] Wheeler, P., Wray, S. and Yalden, D. (2012) Brown Hare and Mountain Hare. In: Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trewhella, W.J., Wells, D. and Wray, S. (2012). UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southampton.

## 2.3 Survey Methodology

### 2.3.1 Badger

The surveys consisted of a walkover of the Site and a 100m buffer (access permitting) to visually inspect and assess the Site for its potential to support badgers. All potential access routes and, where possible, plantations were surveyed. Badger surveys were carried out according to recommended guidelines. Evidence of badger activity searched for included:

- Setts: badger setts typically have characteristic shapes and dimensions;
- Paw prints and badger hair caught on hedges and fences;
- Foraging signs: foraging badgers leave distinctive marks when foraging;
- Characteristic worn pathways; and
- Latrines: badgers defecate in pits, often clustering several pits into a latrine.

### 2.3.2 Otter

The surveys consisted of walkovers of the Site and a 200m buffer to visually inspect and assess the Site for its potential to support otters. Otter surveys were undertaken according to recommended guidelines. All suitable watercourses and waterbodies located within the Site, and where accessible, within the 200m buffer of the Site were surveyed. Evidence of otter activity searched for included:

- Holts: otter holts are often found in various situations. These include cavities in a riverbank, hollow trees, between roots, rocky clefts, rabbit burrows or tunnels in peat. The entrance may be underwater with an air vent into the chamber, which is lined with dry vegetation;
- Couches: otters often have resting spots or couches whey they lay up. An otter may have many holts or resting sites within its home range;
- Paw prints in muddy or silted areas along the burn edges;
- Spraints or otter faeces. Often found on boulders, under bridges, elevated positions, fallen trees or on piles of grass; and
- Characteristic worn pathways/slides or haul out areas.

### 2.3.3 Water Vole

For water voles the approach was to thoroughly search a strip approximately 5m wide on each side of the watercourse banks for signs of water vole activity, in accordance with

the standard survey methodology. The survey included all watercourses, ditches and blocked drains etc within a 200m buffer of the Site. This extended up to 50m up and downstream of any watercourse or ditch system potentially impacted by the proposed development. Banks with steep sides are most commonly used by water vole, though all areas were searched in this instance. Wider strips were searched where suitable habitat occurred. The following field signs were searched for:

- Sightings of the species itself;
- Tracks/footprints found in soft substrate such as mud along the water-line;
- Droppings and latrines also found along the water-line;
- Burrows, which may be below water or on the bank top; and
- Grazed lawns, often associated with the burrows and feeding signs such as piles of cut vegetation.

### 2.3.4 Red Squirrel

An initial assessment was undertaken to identify suitable habitat and the presence of red squirrel on site. The methodology included identifying field signs, as follows:

- Dreys that are;
  - Constructed of compacted twigs in a tree fork.
  - Spherical (approx. 30cm in diameter).
  - Usually located above 6m and exceptionally below 3m. - Usually close to the main trunk of a conifer.
  - Lined with soft hair, moss and dried grass.
- Feeding remains - Stripped cores and scattered scales of cones - Hazel shells split neatly in two with a small chip at the apex - Husks of acorns.
- Bark stripping.
- Footprints - Only visible in soft ground or snow. - Distinctive pattern of smaller fore prints (4 toes) behind larger hind prints (5 toes). Approximately 60mm or smaller in diameter.

### 2.3.5 Pine Marten

The survey included a systematic search for signs of pine marten presence and potential den sites within 250m of the proposed development (where accessible) and determining habitat suitability for pine marten, following methodology set out in Cresswell et al. (2012). Evidence of this species includes scat, footprints, and dens. Pine martens are elusive and largely nocturnal, which makes them difficult to see, but their scats are often quite distinctive and the most commonly encountered field sign. Scats are most easily found

along forest tracks. Scat is highly variable depending on diet but classic pine marten scat is highly twisted and contains bone fragments and hair. Pine marten scat also has a sweet Parma Violet fragrance.

Pine martens prefer overhead cover in woods and their dens can be found in large holes or cavities in trees and breeding nests can be found in rocks, in hollow trees or in a bird or squirrels' nest. Pine martens are active all year round but are best surveyed between May and September, and ideally in June-August when scats are most abundant. Pine martens are more active at this time (June-August) and weather conditions or leaf litter are less likely to degrade or obscure scats.

### 2.3.6 Brown Hare

A survey, following methodology set out in Cresswell et al. (2012)[18], of all areas within the Site, including vegetated boundaries and fence lines was undertaken to make direct observations of hare activity and to search for the field evidence of hare including:

- Forms (resting places);
- Foraging evidence (often distinctive from rabbit and vole); and
- Brown hare droppings (generally larger and longer than that of rabbit).

### 2.3.7 Other Observations

Records of all and other species, such as reptiles, amphibians, hedgehog and deer, were also observed during all other survey times and site walkovers and were noted.

[18] Wheeler, P., Wray, S. and Yalden, D. (2012) Brown Hare and Mountain Hare. In: Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trewhella, W.J., Wells, D. and Wray, S. (2012). UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southampton.

# 3 RESULTS

## 3.1 Background Data Search

### 3.1.1 Biodiversity Action Plans

The Aberdeenshire Council website was searched for all relevant and up to date information regarding biodiversity, which included the North East Scotland Biodiversity Partnership[19], Aberdeenshire Local Nature Reserves and Conservation Sites[20], and Aberdeenshire Council Nature Conservation[21]. Information was searched on The Scottish Wildlife Trust[22] for reserves in the area.

### 3.1.2 Designated Sites

***Statutory Sites***

There are no statutory designated sites designated for ecology within 2 km of the Application Site Boundary.

***Non-Statutory Sites***

There are multiple non-statutory designated woodland sites of interest within 1km of the Application Site Boundary (see Table 2 and Figure 3) and three Local Nature Conservation Sites within 2 km of the Application Site Boundary (see Table 2 and Figure 2).

***Other Notable Sites***

Other notable sites under 10km distance includes Loch of Strathbeg SPA & Buchan Ness to Collieston Coast SPA (Figure 2).

**Table 2: Non-statutory designated sites within 2 km of the site.**

| Site of Interest | Distance from site (approx.) | Description/Qualifying Features of Interest only |
|---|---|---|
| **Native Woodland Survey Scotland (main ones listed only)** | | |
| **Lowland mixed deciduous woodland (multiple)** | 42m | Mixed mature<br>Young pole, immature<br>Established regeneration<br>Pole immature |

[19] https://www.nesbiodiversity.org.uk/our-biodiversity-in-the-north-east-of-scotland/
[20] https://www.aberdeenshire.gov.uk/environment/natural-heritage/local-nature-reserves/
[21] https://www.aberdeenshire.gov.uk/environment/natural-heritage/biodiversity/
[22] https://scottishwildlifetrust.org.uk/

| Site of Interest | Distance from site (approx.) | Description/Qualifying Features of Interest only |
|---|---|---|
| **Wet woodland (multiple)** | 200m<br>32m<br>0m | Young pole, immature<br>Mixed Pole immature, mainly broadleaved<br>Young pole, immature (Mixed mainly conifer) |
| **Unidentifiable type (multiple)** | 163m<br>218m<br>113m | Mixed mature, with some regeneration<br>Established regeneration<br>Young pole, immature |
| **Nearly-native woodland** | 30m<br>60m | Young pole, immature<br>Young pole, immature |
| **Upland birchwood** | 64m | Established regeneration |
| **Ancient Woodland Inventory** | | |
| **Broadleaved woodland** | 230m | Ancient (of semi-natural origin): 2a |
| **Mainly Conifer** | 54m | LEPO:2b Mainly Conifer |
| | 0m (within working area) | LEPO:2b |
| **Local Nature Conservation Sites** | | |
| **Rattray Head to Peterhead** | Within 250m ESA | Variety of coastal habitats including sand dunes. Good diversity of plant species including several species that are rare in NE Scotland. Adjacent fields important for roosting and feeding geese, waders and wildfowl. |
| **Rora Moss** | 1.3km | Lowland raised bog with acid grassland, ponds and rush pasture. Good variety of peatland species. The southern part of the site is commercial forestry with bog habitat in the unplanted areas. |
| **Skelmuir Hill, Stirling Hill, Dudwick** | 1.6km | Preglacial Buchan Gravels Formation, which is rich in flints, blankets the ridge of Stirling Hill, Hill of Dudwick and Skelmiur Hill. Den of Boddam glacial meltwater channel. |

### 3.1.3 Protected Species Data

NESBReC was utilized to determine if any protected and notable species data had been recorded within a 500m buffer outwith the Site and to improve biodiversity knowledge. The following protected species of interest (Table 3 & Figure 4) were recorded just out with the 200m survey buffer extent, and within the 500m survey extent.

**Table 3: Protected species of interest to a 500m survey buffer.**

| Species | Occurrence | Date Range |
|---|---|---|
| Badger | 10 | 2000-2015 |
| Brown Hare | 11 | 1981-2015 |
| Eurasian Red Squirrel | 1 | 1991-1995 |
| Common Pipistrelle | 4 | 2004-2022 |
| Pipistrelle species | 1 | 2009 |
| Soprano Pipistrelle | 1 | 2006 |
| Daubentons Bat | 4 | 1992-2003 |
| Pine Marten | 2 | 1980 & 2020 |
| European Otter | 14 | 1991-2022 |
| West European Hedgehog | 4 | 1992-2012 |

## 3.2 Field Survey Results

### 3.2.1 Habitat Suitability

Potential suitable habitat is present on the site for bats, badger, otter, water vole, pine marten, hedgehog, brown hare, red squirrel and roe deer. Survey results for these species are summarised below.

### 3.2.2 Badger

Multiple badger setts were recorded within the ESA (see Confidential Annex 1). These varied in size from maternity setts of over 20 entrances to single outliers. Location of setts are shown in Confidential Appendix 1.

The Site is suitable for foraging and commuting for badgers and there are numerous opportunities for foraging in the surrounding habitats. The field margins, hedgerows and woodland offers good connectivity pathways within the surrounding area, as badgers are known to travel widely. Multiple field signs of badger were located along the route and included burrows, pathways, scat, footprints, scrapings and fur on fence wire.

### 3.2.3 Badger Mitigation

The multiple design meetings for the route concentrated on keeping badger setts more than 30m from the construction corridor. This allows construction to proceed without requiring a Licence from NatureScot.

Mitigation[23] proposed is as follows, but is not exclusive to:

- Design a layout that avoids isolating the badgers' territory.
- Avoid artificial lighting around setts (during or after construction).
- Avoid activity between dusk and dawn when badgers are most active.
- Avoid disturbance, including noise and vibration near active setts.
- Keep heavy machinery and excavation work away from setts, include a 30-metre buffer zone.
- During construction, install fencing to protect the sett area (30-metre buffer zone). Badgers must be able to pass underneath or through the fence.
- Retain vegetation around setts to provide cover.
- Safe storage of chemicals.
- Covering any trenches at the end of each working day, or including a means of escape for badgers.
- Capping of temporarily exposed pipe systems out of work hours.
- Pre-construction surveys to check for any new setts that may have arisen between the time of the original survey and start of construction work. Pre-construction surveys should be completed as close to the start of works as possible, and always within the most recent survey period.

### 3.2.4 Otter

Otter field signs (Target Notes: TN_O1-TN_O7) were recorded within the ESA (Figure 5) Two possible otter holts were noted at Target Notes: TN_O1 (Figure 6) and TN_O2. Otters are known to occur on the River Ugie with evidence of a potential otter resting

[23] https://www.nature.scot/sites/default/files/2017-10/A2293028%20-%20Species%20Planning%20Advice%20Project%20-%20Badger.pdf

place, spraints and paw prints. The habitat is suitable for otter on the watercourses including North & South Ugie Water and River Ugie. Holts would be expected to occur under tree roots and thick vegetation along the bankside. Trenchless techniques are proposed for the crossings of all watercourses.

### 3.2.5 Otter Mitigation

As otter are known to be in the ESA and the wider area, wander widely and expand their territories the following mitigation is proposed:

- All personnel are made aware that protected species may exist close to the Site and are at risk from vehicles;
- All trenches dug during construction and exposed open pipes will be covered at the end of each working day to ensure no risk to badgers, otters or any other wildlife that may have the potential to be trapped;
- Ramps will be located within the trenches or pits that can't be covered to allow an exit for any mammal that has gone into a trench or pit;
- A pre-construction otter survey will be required. Pre-construction surveys should be completed as close to the start of works as possible, and always within the most recent survey period; and
- A Protected Species Licence from NatureScot may be required for works within 30m of potential holts.

### 3.2.6 Water Vole

Evidence of water vole (Target Notes: TN_W1 to TN_W20) was recorded within the ESA (Figure 5) and located on the majority of the major river crossings, and minor watercourses and ditches. Water vole burrows (Figure 7), pathways, feeding remains (Figure 8) and latrines were located in vegetation up to 10 metres away from watercourses in suitable habitat such as dense *Juncus effusus* (Figure 9).

Watercourses had high habitat suitability to support water vole, especially where the water flow was slow. Sections of the ditches and watercourse banksides were frequently densely vegetated with rush vegetation and various grasses. This habitat was considered to provide suitable coverage from potential predators, whilst providing suitable food sources.

### 3.2.7 Water Vole Mitigation

As water voles are present on site it is advised that the following mitigation measures are taken to avoid or reduce impact. Discussions regarding water crossings at the design

meetings were undertaken and the proposed mitigation approach in order to avoid water voles and their habitats is by trenchless techniques. Mitigation can include, but is not exclusive to the following:

- That all water courses and areas where water voles are present is traversed via trenchless techniques, if appropriate;
- Ensure water levels do not fluctuate as changing water levels can flood burrows or dry out small watercourses etc;
- Pollution control by ensuring good drainage design and construction work practices; and
- A pre-construction water vole survey will be required. Pre-construction surveys should be completed as close to the start of works as possible, and always within the most recent survey period.

### 3.2.8 Red Squirrel

There is suitable habitat on Site for red squirrel and surveys were undertaken and no signs of red squirrel were recorded.

### 3.2.9 Red Squirrel Mitigation

If any trees are to be felled then a red squirrel survey is required before felling commences.

### 3.2.10 Pine Marten

No evidence of pine marten was recorded within the ESA. A pine marten's home range can vary considerably depending on availability of contiguous habitat, food resources, sex and season, with home ranges as little as 0.2km² in lowland woodland, up to 9km² in commercial mixed conifer plantations and that animals may travel several kilometres during activity bouts. In discontinuous habitats, linear features such as established hedgerows, stone walls, roads and small stands of woodland may be important features as links between foraging areas. The proposed development is in landscape which is dominated by farmland, major and minor watercourses and scattered woodland. Important linear features consist of treelines and multiple hedgerows.

Considering the quality, and size of habitats available within the landscape of the proposed development footprint and corridor, it is likely that any resident pine martens may be foraging further and possibly using available linear features, and the population may occur at low densities.

### 3.2.11 Pine Marten Mitigation

There is suitable habitat on site, such as woodlands and plantation, it is advised that the following mitigation measures are taken to avoid or reduce impact. Mitigation can include, but is not exclusive to the following:

- If pine marten dens are found, maintain exclusion zones around the den.
  - For dens where pine martens aren't breeding, the boundary of the exclusion zone should be a minimum of 30m from the den.
  - An exclusion zone of at least 100m is necessary where dens are known or suspected of being used for breeding and works in the breeding season cannot be avoided (March-June inclusive).
- A pre-construction pine marten survey will be required. This is to enable checks for any new dens that may have become occupied after the original survey, and to ensure the measures proposed to minimise impacts on pine martens remain appropriate.
- Pre-construction surveys should be completed as close to the start of works as possible, and always within the most recent survey period.

### 3.2.12 Brown Hare

Evidence of brown hare were recorded during the survey, with multiple hares sighted across the Site during the survey period. The habitat of farm fields and woodland is suitable for brown hare.

### 3.2.13 Brown Hare Mitigation

There is suitable habitat on site, and it is advised that the following mitigation measures are taken to avoid or reduce impact. Mitigation can include, but is not exclusive to the following:

- Risk of direct mortality of brown hares during the construction phase will be reduced through implementation of best practice;
- A qualified ecologist or ECoW to be present during any vegetation removal and cutting operations within suitable habitats that support brown hare;
- Pits should be covered or have mammal ramps to allow any trapped species to escape; and
- Pre-construction surveys should be completed as close to the start of works as possible, and always within the most recent survey period.

### 3.2.14 Bats

No buildings are to be demolished and it is expected that felling of mature trees will be avoided. Preliminary Roost Assessments (PRA) of trees that have bat roost potential were highlighted, however design meetings clarified that these trees were not being felled.

### 3.2.15 Bat Mitigation

That if any trees are to be felled then a PRA is carried out on these specific trees before felling.

### 3.2.16 Other Species

No evidence of reptiles (including sightings) were recorded during surveys.

Common frog and toad were infrequently recorded throughout the wetter habitats of the ESA during surveys. Habitats were suitable for amphibians in the wetter areas of vegetation, such as waterlogged grassland, marshy grassland and swamp vegetated habitats.

Deer prints were evident on wet mammal paths and indicated that the habitat is used by deer. Small numbers of roe deer were noted infrequently. There are no impassable fences in the wider area so the deer can roam widely and freely.

Every five years the British Deer Society undertakes a survey[24] plotting the current distribution of all six species of wild deer in Great Britain and Northern Ireland and uses it to monitor and record changes from the previous survey to establish if the range has changed.

The results of the 2016 Deer Distribution Survey[25] indicate the following in the area where the site is located:

- Roe deer were recorded in 2007 and/or 2011 and reconfirmed in 2016.
- No other deer species have been recorded in the area of the site.
- The Deer distribution survey and map are awaiting update and collation of the 2022 survey data.

[24] https://www.bds.org.uk/science-research/deer-surveys/deer-distribution-survey/

[25] https://www.bds.org.uk/wp-content/uploads/2020/05/Roe-DD-16.pdf

### 3.2.17 Summary

The protected species surveys confirmed the presence of badger, otter, water vole and brown hare within the ESA, with suitable habitat to varying degrees present for bats, red squirrel and pine marten.

Habitats did vary in their suitability to support protected species due to the differences in habitats present within the ESA such as semi-improved grassland, agricultural fields, marshy grassland, swamp vegetation, scrub, hedges, woodlands and conifer plantation.

Several design meetings regarding the route have taken place. Where possible the route has avoided woodland, shelter belts, hedgerows and in general has been routed in agricultural fields. This reduces the impact on any ecological constraints as agricultural fields have limited ecological importance. All known badger setts have been given a minimum 30m buffer as recommended by NatureScot. Trenchless techniques is the proposed method on most watercourses and therefore no detrimental impact should occur for water vole or otter.

All mammal or European Protected Species surveys provide only a snapshot of animal activity and are intended to inform a planning application only. Mammal activity is likely to vary over time and in differing conditions and, as such, a negative result does not prove a lack of all mammal activity but does provide a strong indication of activity levels.

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# 5 FIGURES

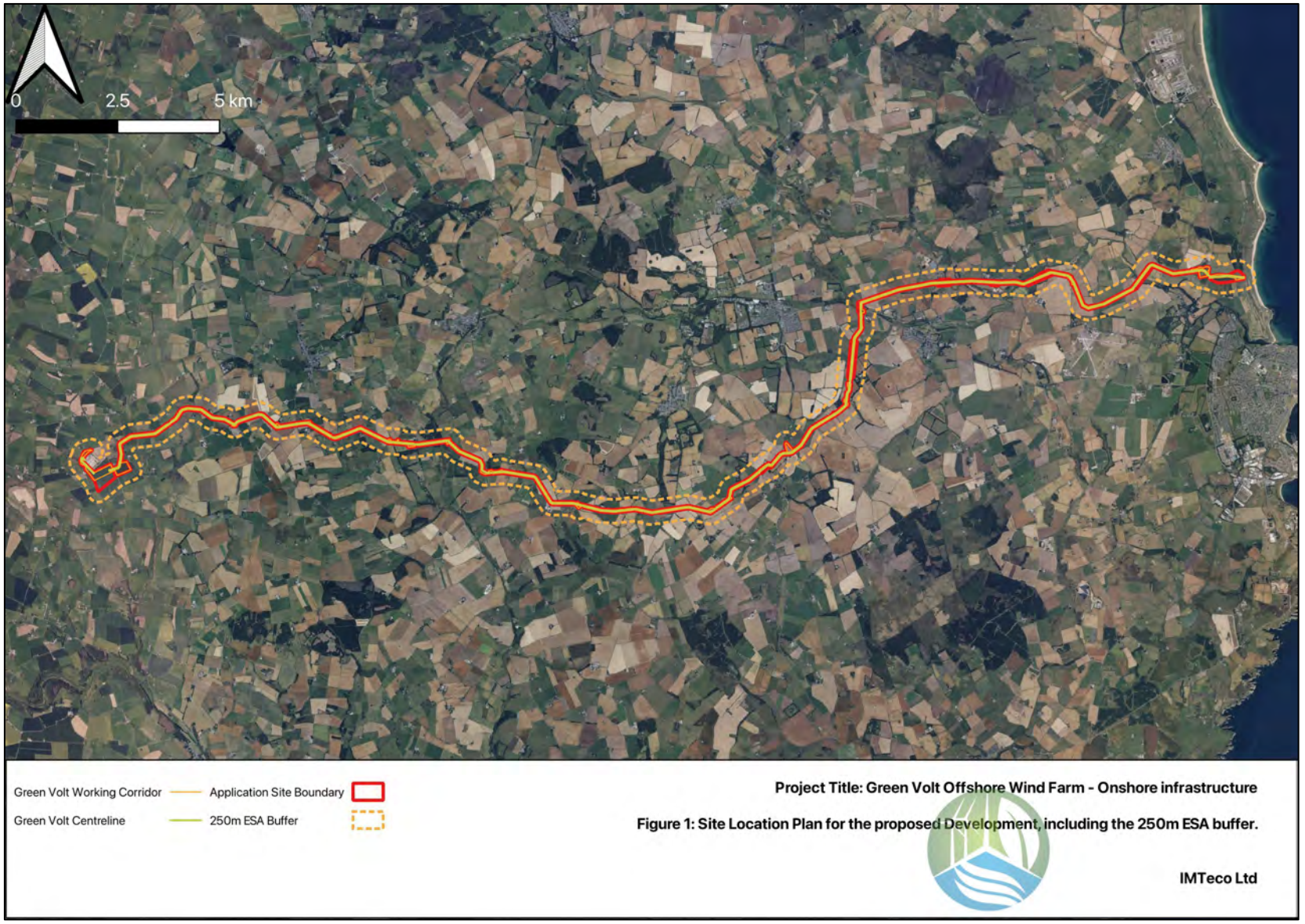


**Figure 1. Site Location Plan for the Proposed Development and Ecology Survey Area (ESA).**

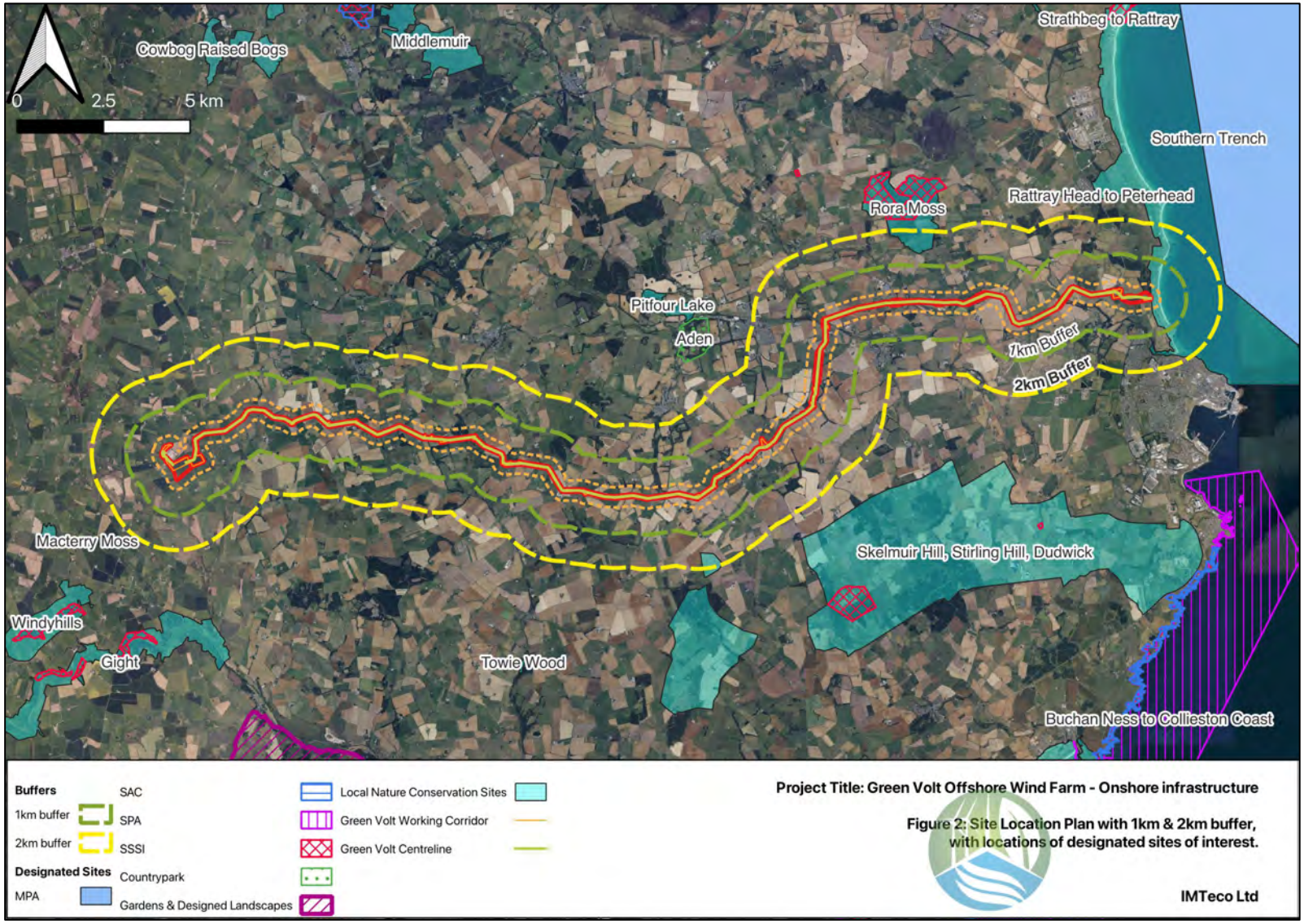


**Figure 2. Site location plan with 1km & 2km buffer and locations of designated sites of interest.**

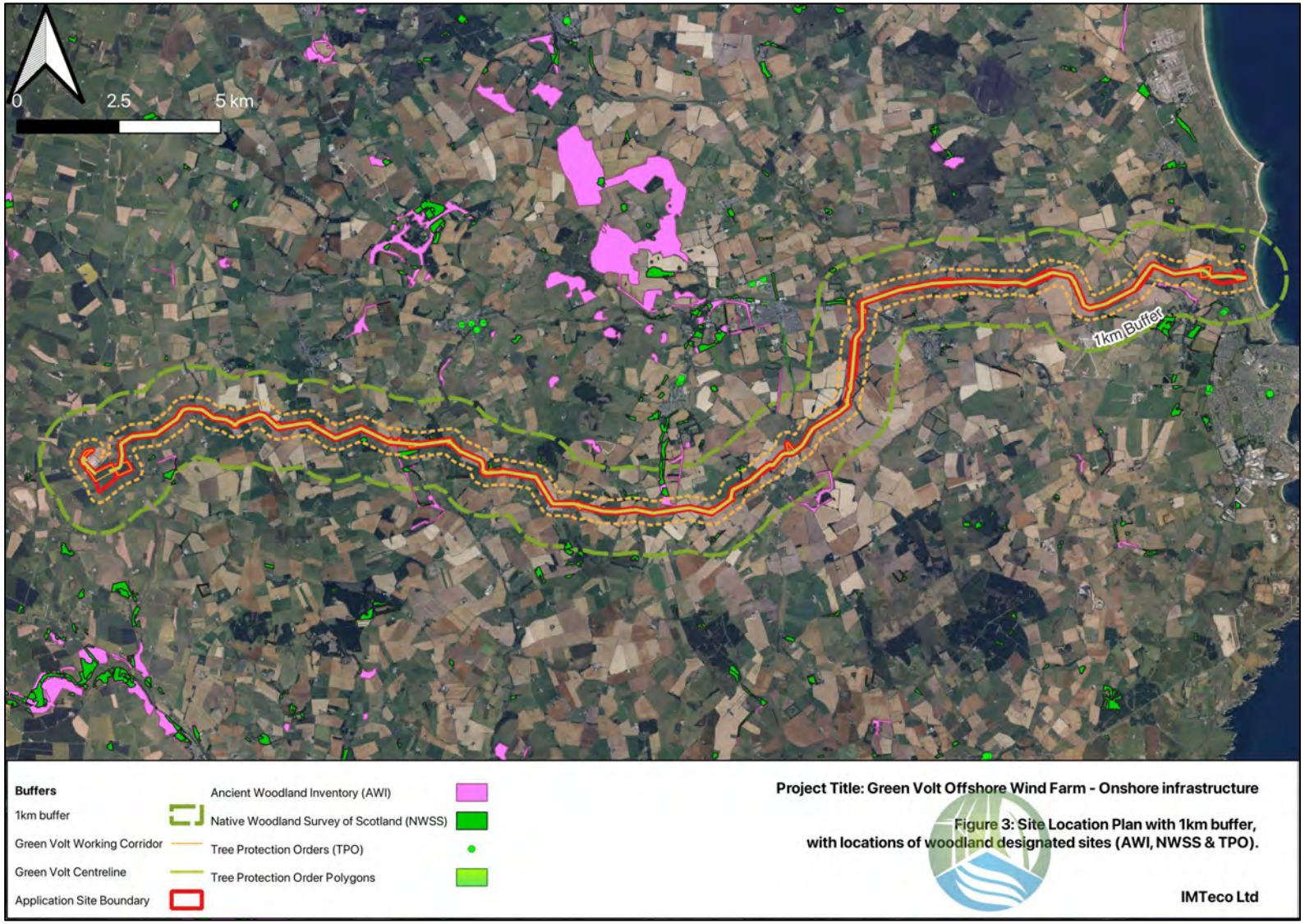


**Figure 3. Site location plan with 1km buffer and locations of woodland sites of ecological interest.**

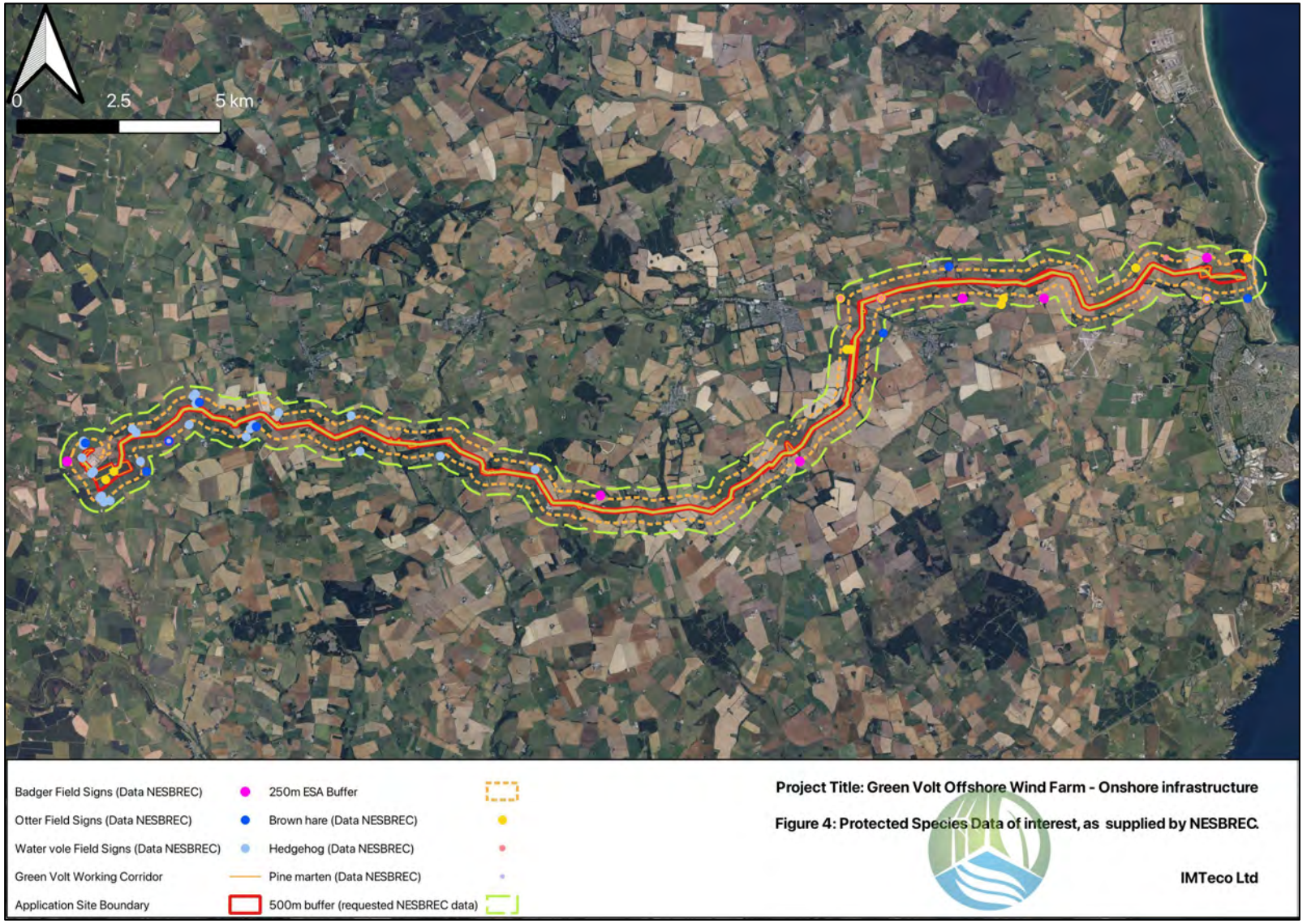


**Figure 4. Protected Species Data of interest, as supplied by NESBREC.**

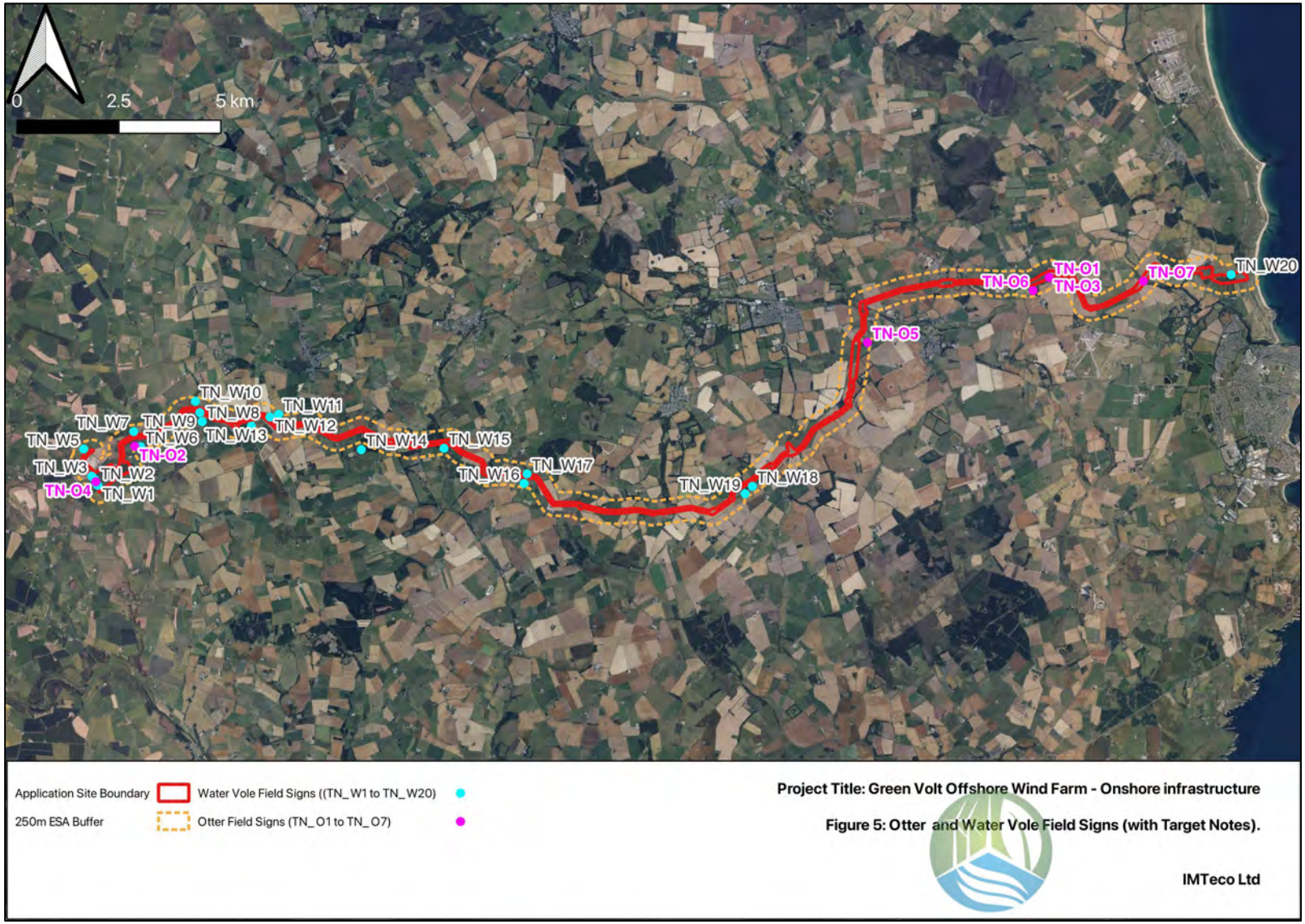


**Figure 5. Location of Otter and Water Vole Field Signs.**

**Figure 6. Potential otter resting place on an embankment of the River Ugie.**

**Figure 7. Water vole burrows at a ditch embankment.**

**Figure 8. Water vole feeding signs.**

**Figure 9. Water vole field signs in *Juncus effusus* habitat, such as, feeding, latrines, pathways and burrows up to 10m distance from watercourse.**

# APPENDIX A – POLICY AND LEGISLATION

| | Legislation or Guidance Document |
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| **Legislation** | Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011[26], which transpose the EIA Direction into the Scottish planning system;<br>Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (The Habitats Directive)[27];<br>Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (Water Framework Directive)[28];<br>The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations), which transposes the Habitats Directive into UK law[29];<br>Environmental Impact Assessment Directive 85/337/EEC (the EIA Directive)[30];<br>The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017[31];<br>The Water Environment and Water Services (Scotland) Act 2003 (WEWS)[32];<br>The Water Environment (Controlled Activities) (Scotland) Regulations 2011[33][34], Amendment Regulations 2021[35];<br>The Wildlife and Countryside Act 1981 (as amended)[36];<br>Nature Conservation (Scotland) Act 2004 (as amended)[37];<br>The Wildlife and Natural Environment (Scotland) Act 2011[38]<br>The Protection of Badgers Act 1992[39] |
| **Policy** | Fourth National Planning Framework (NPF4)[40];<br>UK Post-2010 Biodiversity Framework (2012)[41]; |

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GREEN VOLT

# Appendix 6.3

## Breeding Bird Survey

Onshore EIA Report: Volume 3

IMTeco Ltd

# Appendix 6.3: Breeding Bird Surveys

## Green Volt Onshore Infrastructure Cable Route Corridor Peterhead to New Deer Aberdeenshire.

July 2023

IMT*eco* Ltd

# Notes:

Site: Green Volt Onshore Infrastructure, Peterhead to New Deer
Client: Green Cat Renewables Ltd
Date: 01/08/2023
Status: FINAL

| Version | Date | Author | Checked | Approved |
|---|---|---|---|---|
| Draft | 15/06/2023 | I Tierney | Y | |
| Final | 01/08/2023 | I Tierney | Y | |
| | | | | |
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| | | | | |

# CONTENTS

# 1 INTRODUCTION

## 1.1 Introduction

The Offshore Project is being proposed and intended to be operational by 2026. Generated power will be exported by means of a subsea cable that will landfall on the East Scottish coast north of Peterhead, at the approximate location of NK 11423 49014, before heading west to a new Substation to be built at New Deer. The Onshore Infrastructure associated with the Offshore Project includes; the Landfall, the Cable Route Corridor, and the Substation Compound. The onshore cables are to be generally laid in an open cut trench (i.e., excavating down to required depth, installing the duct, and then backfilling), except where there are geographical or environmental constraints that would prohibit open cut trenching. At these locations, it is intended to use trenchless techniques.

## 1.2 Purpose of this Report

This report describes methods and results of Breeding Bird Surveys (BBS) undertaken between April to June 2023 to obtain baseline ecological information, to inform the Ecological Impacts Assessment (EcIA) for the Green Volt Onshore Infrastructure corridor (known as the Proposed Development) from the landfall point at Peterhead to New Deer Substation (Figure 1). Surveys for breeding birds were undertaken during the appropriate seasons or months as recommended in guidance by NatureScot[1][2].

This report has been undertaken in accordance with the 'Guidelines for Ecological Impact Assessment in the UK' (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018)[3].

The aims of this ornithological assessment are:

- To assess the potential ornithological constraints to any development on this site;
- To assess the ornithological value of the site with regards to breeding birds;
- To carry out appropriate survey work; and
- To recommend further survey work if required.

[1] https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms
[2] https://www.nature.scot/doc/standing-advice-planning-consultations-birds
[3] https://cieem.net/wp-content/uploads/2019/02/Combined-EclA-guidelines-2018-compressed.pdf

Important issues that are considered in the overall assessment are:

- If the proposed development would have a detrimental impact on species protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- Species classed as BoCC5 Red Listed;
- If the proposed development would have a detrimental impact on bird species included in Annex I the Council Directive 2009/147/EC on the Conservation of Wild Birds;
- If the proposed development would have a detrimental impact on bird species on sites designated for ornithological interests within the Zone of Influence as specified by NatureScot.

## 1.3 Scope of Ornithological Assessments

Given the context of the above data information, it was considered that the following bird species/groups would be target species:

- Annex 1 and Schedule 1[4] species;
- Red listed Birds of Conservation Concern (BoCC5[5][6]).

The aim of the BBS was to obtain baseline information regarding the occurrence and distribution of protected species within the Ecological Survey Area (ESA) to provide an accurate and robust baseline on which to base the Ecological Impacts Assessment. The following terminology is used throughout:

- The Proposed Development;
- The Site: is the area within which all new infrastructure shall be contained; and
- Ecology Survey Area (ESA): is the area in which ecological surveys were undertaken.

## 1.4 Ecological Context

The Proposed Development between Peterhead and New Deer extends for approximately 27km though predominantly agricultural crop and grazing fields normally lineated by hedgerows and tree lines. Multiple design meetings have established a route that avoids woodland where possible including both residential and farm buildings. Within

[4] https://www.nature.scot/doc/protected-species-list-wca-schedules-1-1a-a1-2-3-and-4
[5] https://www.bto.org/sites/default/files/publications/bocc-5-a5-4pp-single-pages.pdf
[6] https://britishbirds.co.uk/sites/default/files/BB_Dec21-BoCC5-IUCN2.pdf

the wider area there are farm fields, commercial conifer plantations, deciduous and mixed woodland, scrub, hedges, quarries, ditches, watercourses and urban settlements.

## 1.5 Policy & Legal Context

Guidance for assessing the potential impact of the Proposed Development on the ornithological features of the development site will be based on the following statutory, general, and national guidance listed in Appendix A. Any appropriate local policy and guidance will also be considered.

# 2 METHODS

## 2.1 Background Data Search

### 2.1.1 Protected Species

To provide historical and local context to the EcIA, existing records of protected and/or notable species were sought up to and within a 2 km radius of the Site. This information was obtained from the following:

- NatureScot SiteLink[7];
- National Biodiversity Network (NBN)[8];
- Scottish Wildlife Trust;
- Scotland's Environment Map;
- North East Scotland Biological Records Centre (NESBReC);
- Public meetings with landowners.

### 2.1.2 Designated Sites

The desk study aimed to identify statutory designated sites of ornithological conservation interest within 10km of the site boundary and for any reference materials relating to the ornithology of the site. A list of data sources is given in *Table 1*.

**Table 1: Data sources.**

| Information Obtained | Available From |
|---|---|
| Designated site locations and citations/Protected areas | SiteLink Nature.scot (https://sitelink.nature.scot/map) |
| Designated site locations and citations | Scottish Natural Heritage/Nature.scot (https://www.nature.scot) |
| Designations and legal protection of noteworthy species | Joint Nature Conservation Committee (JNCC: https://jncc.gov.uk) |
| Scottish Wildlife Trust | https://scottishwildlifetrust.org.uk |
| Aberdeenshire Local Development Plan 2023 | https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2023/ (https://storymaps.arcgis.com/stories/27f01f5e60544ece88580ca32dc4beb5) and Development Plan Scheme 2023 (https://www.aberdeenshire.gov.uk/media/27636/development-plan-scheme-2023.pdf) |

[7] https://sitelink.nature.scot/home

[8] https://nbn.org.uk/

| | |
|---|---|
| | Aberdeenshire Coastal Zone (https://online.aberdeenshire.gov.uk/ldpmedia/LDP2021/Appendix5CoastalZone.pdf)<br>Aberdeenshire Local Nature Conservation Sites (https://online.aberdeenshire.gov.uk/ldpmedia/LDP2021/Appendix12LocalNatureConservationSites.pdf) |
| Aberdeenshire Nature Conservation | https://www.aberdeenshire.gov.uk/environment/natural-heritage/biodiversity/#:~:text=Policy%20P1%20of%20the%20Aberdeenshire,the%20scale%20of%20the%20development. |
| North East Scotland Biodiversity Partnership | https://www.nesbiodiversity.org.uk/our-biodiversity-in-the-north-east-of-scotland/<br>(c/o The James Hutton Institute) |
| Biological Data Records | NESBReC, Natural Environment Team, Aberdeenshire Council (https://nesbrec.org.uk/) |

A search was made for information on statutory designated sites (Internationally and Nationally important sites for ornithology) within 10 km of the site boundary and non-statutory designated sites (important in a local context) within 1 km. A search was also made for records of noteworthy species and locally important species within 2 km of the site boundary. Species included in the search parameters were:

- European Protected Species (listed on Schedule 2 and 4 of the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended);
- Nationally Protected Species under Schedules 1, 5 and 8 of The Wildlife & Countryside Act 1981 as amended by The Wildlife and Natural Environment (Scotland) Act 2011.

Biological records were sought from NESBReC, Natural Environment Team, Aberdeenshire Council[9].

[9] NESBReC https://nesbrec.org.uk/

## 2.2 Field Surveys & Survey Methodology

Breeding bird surveys were undertaken and supervised by Irene Tierney & Dr Garry Mortimer Principal Ecologists and full members of the Chartered Institute of Ecology and Environmental Management (MCIEEM) and encompassed all land within the Site, in line with current NatureScot guidance[10][11].

## 2.3 Breeding Bird Surveys

The area surveyed was an area of approximately a 250m buffer either side of the red line boundary, totalling 22.3 $km^2$ (Figure 1) and was used throughout the breeding bird surveys. The survey work was undertaken according to a scaled down version of the Common Bird Census (CBC) methodology (Gilbert *et al*., 1998; Marchant, 1983). This methodology is specifically put forward by NatureScot to survey lowland bird species where the survey area is walked, and the route varied each survey. There were monthly day visits throughout each month starting in mid-April through to late June in 2023. Surveys were undertaken out during periods of good weather (i.e. good visibility, no persistent rain or fog, avoiding excessive heat or cold or wind speeds exceeding Beaufort Force 4) from one hour before dawn to approximately six hours after dawn. Surveys concentrated on the proposed Cable Route Corridor through open fields, where appropriate.

## 2.4 Scarce Breeding Bird within a 2km Radius of Site

Following guidance from Hardey 2013[12], surveys were undertaken monthly between April and late June 2023 within a 2km buffer (Figure 2) looking for signs of scarce breeding species with a combination of fixed-point watches and walkovers. Species that were specifically surveyed for, but not limited to, included Schedule 1 species, common crane, short-eared owl, redshank, curlew, lapwing.

[10] NatureScot: Planning and development: protected species; https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-protected-species

[11] https://www.nature.scot/doc/standing-advice-planning-consultations-birds

[12] Hardey, J., Crick, H.Q.P., Wernham, C.V., Riley, H., Etheridge, B. & Thompson, D.B.A. Published: January 2013

# 3 RESULTS

## 3.1 Background Data Search

### 3.1.1 Biodiversity

The Aberdeenshire Council website was searched for all relevant and up to date information regarding biodiversity, which included the North East Scotland Biodiversity Partnership[13], Aberdeenshire Local Nature Reserves and Conservation Sites[14], and Aberdeenshire Council Nature Conservation[15]. Information was searched on The Scottish Wildlife Trust[16] for reserves in the area.

### 3.1.2 Designated Sites

***Statutory Sites***

There are statutory designated sites with qualifying features for ornithology within 10 km of the site boundary, and include Loch of Strathbeg SSSI, SPA; Bullers of Buchan Coast SSSI; SAC and Buchan Ness to Collieston Coast SPA.

***Other Notable Sites***

Other notable sites include Rattray Head to Peterhead LNCS which is within the 250m ESA buffer at the eastern coastal section of the route. This LNCS is noted for its adjacent fields important for roosting and feeding geese, waders and wildfowl.

### 3.1.3 Protected Species Data

NESBReC data was utilized to determine if any breeding bird species data had been recorded within a 500m buffer outwith the site area footprint and to improve biodiversity knowledge. The following protected species of interest (Table 2) were recorded to a 500m survey extent of the route. It needs to be noted that many of these records were not recorded specifically as breeding, so could include passage birds. However, it is considered that all of the species recorded have bred historically or still breed at the present time.

[13] https://www.nesbiodiversity.org.uk/our-biodiversity-in-the-north-east-of-scotland/
[14] https://www.aberdeenshire.gov.uk/environment/natural-heritage/local-nature-reserves/
[15] https://www.aberdeenshire.gov.uk/environment/natural-heritage/biodiversity/
[16] https://scottishwildlifetrust.org.uk/

**Table 2: Breeding bird species of interest to a 500m survey buffer (NESBReC).**

| Species | Occurrence | Date Range |
|---|---|---|
| Corn Bunting | 16 | 2002-2010 |
| Lesser Redpoll | 12 | 2007-2020 |
| Yellowhammer | 92 | 2002-2020 |
| Reed Bunting | 32 | 2002-2020 |
| Linnet | 31 | 2002-2020 |
| Bullfinch | 9 | 2019-2020 |
| Grasshopper Warbler | 11 | 2004-2019 |
| Short-eared Owl | 3 | 2000-2020 |
| Barn Owl | 5 | 2003-2020 |
| Curlew | 15 | 2005-2020 |
| Lapwing | 52 | 2003-2020 |
| Grey Partridge | 9 | 2002-2020 |
| Skylark | 100+ | 2002-2020 |
| House Sparrow | 53 | 2002-2020 |
| Tree Sparrow | 49 | 2002-2020 |
| Dunnock | 49 | 2002-2020 |
| Starling | 58 | 2002-2020 |
| Song Thrush | 49 | 2002-2020 |

## 3.2 Field Survey Results

### 3.2.1 Habitat Suitability

The Cable Route Corridor was designed to follow predominantly farmland habitat of grazing and arable fields. Small areas of woodland and hedgerows are present; however, the route is proposed to traverse through agricultural fields wherever possible. Several

water crossings are proposed, these are to be traversed by trenchless methodology for crossings.

A homogenous farmland habitat of grazing and arable fields has a limited attraction to breeding bird species, Table 2 lists species that were recorded by NESBReC between 2002-2020. The only species in that list that are predominantly ground nesters include skylark, lapwing, curlew, grey partridge, short eared owl and corn bunting.

The habitat on wetter areas e.g. by the River Ugie often included rushes, reeds and dense vegetation. This would hold breeding species e.g. reed bunting, sedge warbler, grasshopper warbler, snipe.

### 3.2.2 Breeding Birds

Twenty-two species of birds designated as BoCC Red or Amber listed were recorded as breeding or possibly breeding within the survey area (Table 3). Of these twenty-two species only four species were recorded breeding in open or arable fields. The open grazing and arable fields had scattered pairs of skylarks throughout the survey area and small numbers of meadow pipit with corn buntings recorded and oystercatcher. All the other species recorded were along treelines, hedge rows, woodland edges, rough dense vegetation and near water.

No hen harrier, short eared owl, lapwings or curlew were recorded breeding within the survey area. Curlews were heard offsite to the north near Ednie. Sparrowhawk, kestrel and buzzard were deemed to be breeding throughout the survey area where plantations and mature trees were present. Snipe were recorded calling in suitable rough habitat near the River Ugie. Sedge warblers were relatively common in these areas along with smaller numbers of reed bunting and occasional grasshopper warbler. Breeding bird species near plantation edges and mature treelines included sparrowhawk, stockdove bullfinch, buzzard, wren, coal tit, robin, willow warbler, goldcrest, chaffinch and blackbird.

**Table 3: Breeding bird species list (BoCC5 Red or Amber designation): April – June 2023. (B = Breeding, PB = Possible Breeding)**

| Species | Population Estimate -Pairs | Habitat | Status |
|---|---|---|---|
| Mallard | 3 | River Ugie | B |
| Stock Dove | 4 | Treelines/Woodland | PB |
| Wood Pigeon | Common | Treelines/Woodland | B |

| Species | Population Estimate -Pairs | Habitat | Status |
|---|---|---|---|
| Snipe | 3+ | Overgrown vegetation by water | B |
| Oystercatcher | 4+ | Fields and quarries | PB |
| Sparrowhawk | 3+ | Woodland | B |
| Kestrel | 2 | Treelines/Woodland | PB |
| Sedge Warbler | 30+ | Overgrown vegetation by water | B |
| Willow Warbler | 10+ | Woodland edges | B |
| Wren | Widespread | Woodland edges and hedgerows | B |
| Song Thrush | 5 | Woodland edges and hedgerows | B |
| Dunnock | Widespread | Woodland edges and hedgerows | B |
| Bullfinch | 3 | Woodland edges and hedgerows | B |
| Meadow Pipit | 10+ | Open fields | B |
| Reed Bunting | Scattered | Overgrown vegetation by water | B |
| **Cuckoo** | 2 | | PB |
| **Skylark** | 30+ | Open fields | B |
| **Lapwing** | 1-2 | Open fields | PB |
| **Grasshopper Warbler** | 5 | Rough overgrown vegetation | B |
| **Mistle Thrush** | 4 | Woodland edges and hedgerows | B |
| **Corn Bunting** | 3 | Open fields | PB |
| **Yellowhammer** | 10+ | Hedgerows | B |

### 3.2.3 Breeding Bird Mitigation

The results need to be taken in context of where the Cable Route Corridor is proposed. Multiple design meetings have resulted in the selection of a route through grazing and arable fields wherever possible avoiding woodland, trees and plantations etc. Trenchless techniques are to be utilised in ecologically sensitive areas, such as, wetland habitat and water crossings.

In general, the bird breeding season is considered mid-March to end of July. Corn buntings have an extended breeding season with young in the nest until September. Given the very small number of species recorded breeding in the fields the following mitigation is proposed:

- That a qualified ecologist or ECoW to be present during any vegetation removal or ground clearance.
- Pre-construction breeding bird surveys will be required in the working corridor if ground clearance is to take place between mid-March to end of July.
- Pre-construction breeding surveys for corn bunting will continue until late September in appropriate areas with suitable habitat.
- Pre-construction surveys should be completed as close to the start of works as possible, and always within the most recent survey period.
- That if trees need to be felled that species-specific surveys are undertaken for species that could nest in trees.

### 3.2.4 Summary

The BBS were undertaken to identify species present within the 27km Cable Route Corridor and associated buffer zone. Surveys followed NatureScot Guidance and were undertaken in April, May and June 2023 in ambient weather conditions.

The route did vary in its suitability to support breeding birds due to the variety of habitats present within the ESA with woodlands, mature treelines and conifer plantation supporting more species of breeding birds, as illustrated in Table 3.

Multiple design meetings regarding the route have taken place prior to the layout utilised in this survey report. Where possible the route has avoided woodland, shelter belts, hedgerows and in general has been routed in open fields. This reduces the impact on any ecological constraints as arable and grazing fields have very limited ornithological importance. Trenchless techniques at ecologically sensitive habitats and water crossings and are to be utilised where possible.

The surveys concentrated on birds that have a higher level of protection and are rarer than species considered more commonplace. Target species included Annex 1 and Schedule 1 species, breeding waders and Red & Amber listed Birds of Conservation Concern.

The predominant species recorded in the fields were skylarks and smaller numbers of meadow pipits and occasional corn bunting in arable crop fields. Virtually all the other species recorded were noted in hedgerows, rough overgrown areas, woodland edges and plantations.

No short-eared owl, common crane, curlew, lapwing, redshank, Schedule 1 species or short eared owls were recorded breeding. Given that no buildings are to be demolished or mature trees felled surveys for barn owl were not undertaken. Barn owl is present in the general area.

The magnitude of habitat loss for breeding birds found within the Cable Route Corridor depends on individual species' population, foraging range, habitat preferences and flexibility to cope with any loss. The Cable Route Corridor has a small footprint within a much greater area of similar landscape. If ground clearance takes place in the period March to July then a small number of passerine territories are likely to be affected by the construction of the cable route, substation and infrastructure. Effects are unlikely to be significant at anything above local level for the majority of species, which should easily recover over the long-term.

The project will have no detrimental impact on bird species designated for the Loch of Strathbeg SSSI, SPA; Bullers of Buchan Coast SSSI; SAC and Buchan Ness to Collieston Coast SPA and the Rattray Head to Peterhead LNCS.

# 4 REFERENCES


- Chartered Institute of Ecology and Environmental Management (CIEEM) (2017) 'Guidelines for Preliminary Ecological Appraisal.' 2nd Edition, Technical Guidance Series. Chartered Institute of Ecology and Environmental Management, Winchester.
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- Marchant, J.H. (1983). BTO Common Birds Census Instructions. BTO, Tring.
- Rodwell, J.S. (2006) National Vegetation Classification: User's Handbook. Joint Nature Conservation Committee, Peterborough
- Scottish Biodiversity List, (https://www.webarchive.org.uk/wayback/archive/20160402063428/http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL)
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- SNH (2020) Protected areas SiteLink, last accessed June 2023, available at: https://sitelink.nature.scot/home
- Usher M.B. (1986) Nature Conservation Evaluation. London: Chapman & Hall
- UK Biodiversity Action Plan Priority Habitat Descriptions accessed online at: http://jncc.defra.gov.uk/PDF/UKBAP_PriorityHabitatDesc-Rev2011.pdf
- Usher M B (1986) Wildlife Conservation Evaluation, Chapman & Hall, London.

# 5 FIGURES


**Figure 1. Site Location Plan and Ecology Survey Area (ESA) where the breeding bird surveys were undertaken.**

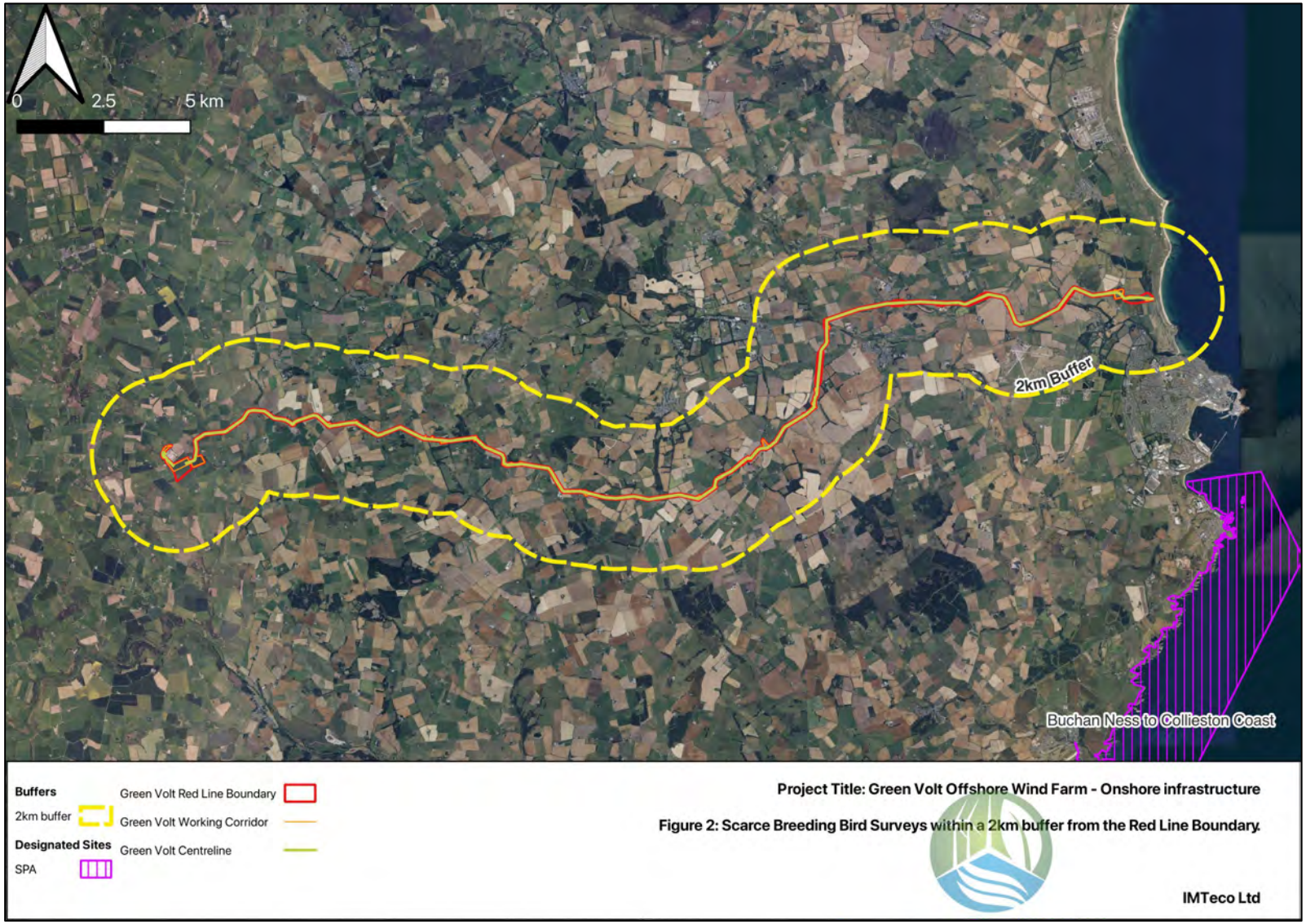



**Figure 2. Scarce Breeding Bird Surveys within a 2km buffer from the Red Line Boundary**

# APPENDIX A – PROTECTED SPECIES LEGISLATION

## A1. General

This section briefly describes the legal protection afforded to the protected species referred to in this report. It is for information only and is not intended to be comprehensive or to replace specialised legal advice. It is not intended to replace the text of the legislation but summarises the salient points.

## A2. European Protected Species

### Habitats Regulations

European Protected Species (EPS) are those listed on Schedule 2 and 4 of the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended).

Regulation 39 states that it is an offence to:

- Deliberately capture, injure or kill a EPS
- Deliberately disturb a EPS, including in particular any disturbance which is likely (a) to impair their ability - (i) to survive, to breed or reproduce, or to rear or nurture their young; or (ii) hibernate or migrate, where relevant; or (b) to affect significantly the local distribution or abundance of the species to which they belong
- Damage or destroy a breeding site or resting place of a EPS
- Possess, control, transport, sell, exchange a EPS, or offer a EPS for sale or exchange.

Confirmed habitats (*i.e.* breeding sites, sheltering places) receive legal protection even when EPS are not present.

Regulation 43 states that it is an offence to:

- Deliberately pick, collect, cut, uproot or destroy a wild plant of a European protected species
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead wild plant of a European protected species, or any part of, or anything derived from, such a plant.

Works affecting an EPS may require a development licence from the licensing authority, which is Scottish Natural Heritage (SNH). Licences are only issued for a specific purpose and where SNH are satisfied that there is no satisfactory alternative (*i.e.* works are for health and safety or for overriding reasons of public interest) and that the favourable conservation status of bat populations will not be detrimentally affected.

At present, *Schedule 2* EPS comprise of bats (*Rhinolophidae* and *Vespertilionidae*), large blue butterfly (*Maculinea arion*), wildcat (*Felis silvestris grampia*), dolphins (*Cetacea*), dormouse (*Muscardinus avellanarius*), sand lizard (*Lacerta agilis*), great crested newt (*Triturus cristatus*),

otter (*Lutra lutra*), smooth snake (*Coronella austriaca*), sturgeon (*Acipenser sturio*), natterjack toad (*Bufo calamita*) and marine turtles (five species).

At present, *Schedule 4* EPS comprise of *Apium repens* (creeping marshwort), *Cypripedium calceolus* (lady's-slipper), *Gentianella anglica* (early gentian), *Liparis loeselii* (fen orchid), *Luronium natans* (floating-leaved water plantain), *Najas flexilis* (slender naiad), *Rumex rupestris* (shore dock), *Saxifraga hirculus* (marsh saxifrage) and *Trichomanes speciosum* (Killarney fern).

## A3. UK Protected Species

### Wildlife and Countryside Act 1981 (as amended)

UK Protected Species are those listed on Schedule 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended) extended by the Nature Conservation (Scotland) Act 2004.

*Section 1* states that it is an offence to:

- Kill, injure or take any wild bird
- Take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
- Take or destroy an egg of any wild bird
- Disturb any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young, or
- Disturb dependent young of such a Schedule 1 bird.

It is not possible to licence works affected nesting birds for development purposes; therefore, work should avoid the nesting bird season (*i.e.* March to August inclusive).

Section 5 of the Act states that it is an offence to:

- Intentionally, or recklessly, kill, injure or take a *Schedule 5* species
- Possess or control a *Schedule 5* species
- Intentionally, or recklessly, or recklessly damage, destroy or obstruct access to any structure or place used by a *Schedule 5* species, and
- Intentionally, or recklessly, or recklessly disturb a *Schedule 5* species whilst is occupies any structure or place.

Section 13 of the Act states that it is an offence to:

- Intentionally picks, uproots or destroys any wild plant included in *Schedule 8*; or
- Not being an authorised person, intentionally uproots any wild plant not included in *Schedule 8*.

Section 14(2)(as amended by Section 14 of the Wildlife and Natural Environment (Scotland) Act 2011), states that it is an offence to plant or otherwise cause to grow any plant in the wild at a place outside its native range.

### Wild Mammals (Protection) Act 1996

All wild mammals are protected under the Wild Mammals (Protection) Act 1996. *Section 1* of the Act states that it is an offence to *mutilate, kick, beat, nail or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering*.

## A4. Invasive Plant Legislation

### Wildlife and Countryside Act 1981 (as amended)

This act is the principal domestic legislation concerning non-native species. It was amended by the Wildlife and Natural Environment (Scotland) Act 2011. These amendments enable Scotland to adopt the internationally recognised 3-stage approach to dealing with invasive non-native species and aim to:

- Prevent the release and spread of non-native animal and plant species into areas where they can cause damage to native species and habitats and to economic interests;
- Ensure a rapid response to new populations can be undertaken; and
- Ensure effective control and eradication measures can be undertaken when problem situations arise.

GREEN VOLT

# Appendix 7.1

## Private Water Supply Risk Assessment

Onshore EIA Report: Volume 3

Report Prepared for:
Flotation Energy Ltd.

Author:
Green Cat Renewables Ltd.

| | | | |
|---|---|---|---|
| Checked by | Corey Simpson | Date | 17/07/2023 |
| Approved by | Steven Higgs | Date | 31/07/2023 |

| Issue History | Date | Details |
|---|---|---|
| V1.0 | 17/07/2023 | First Draft for Review |
| V2.0 | 31/07/2023 | Second Draft for Review |
| V3.0 | 01/08/2023 | Third Draft for Submission |

# Table of Contents

# 1 Private Water Supply Risk Assessment

## 1.1 Introduction

This Report outlines information relating to properties with private water supplies (PWS) in close proximity to the Green Volt Onshore Infrastructure development (Proposed Development). This assessment should be read in conjunction with **Chapter 5 – Project Description** and **Chapter 7 – Geology, Hydrology, Hydrogeology and Soils** of the **Onshore Environmental Impact Assessment Report (EIA) Report,** and with the **Construction Execution Plan (CEP).**

The risk assessment has followed the approach detailed in **Section 1.2** of this Report and outlined below:

- Following the Onshore EIA Report, identify any PWS within the set study area;
- Assess any potential risk to those PWS from the proposed infrastructure and construction activities; and
- Set out appropriate mitigation measured to avoid any significant adverse effects on PWS.

This approach has been developed by Green Cat Renewables (GCR) and is based on professional judgement, the level of available information, and guidance from Aberdeenshire Council and the Scottish Environmental Protection Area (SEPA).

## 1.2 Methodology

A PWS is defined as a small water abstraction of less than 10m$^3$/day from a source such as a spring, well, borehole, or surface waterbody. SEPA typically requires that all groundwater abstractions are identified within 100m of any planned excavations ≤1m in depth, such as for access tracks and cable trenches, or within 250m of excavations >1m in depth, such as for foundations[1]. These distances are equivalent to the potential zones of dewatering that could impact on water quantity.

In addition to screening for PWS within these buffers, this assessment also considers PWS within a 250m buffer of the proposed cable route and 1km of the Proposed Substation foundation to account for any potential hydrological connections that may be impacted by the Proposed Development.

Private Water Supplies (PWS) are categorised under two types:

- Type A) – Supply >50 people, or more than 10m$^3$ of water a day, form part of a commercial/public activity or are used in a commercial/public activity (regulated under The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017)[2], and
- Type B) - Supply < 50 people in total and serving domestic premises only (regulated under The Private Water Supplies (Scotland) Regulations 2006))[3].

PWS data out to 3km from the proposed Cable Route Corridor was requested from the Environmental Health department at Aberdeenshire Council in August 2022. In addition, to confirm that the Council's records were up to date and that none of the relevant properties hold an unregistered supply, a PWS questionnaire was distributed to landowners at the public consultation events and circulated to landowners by a land agent working on behalf of the Applicant. The questionnaire requested the current status, location, and type of the water source and any associated pipework, along with a map of the proposed cable route so that the user could illustrate the location

[1] https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions.pdf (Last Accessed 12/06/2023)
[2] https://www.legislation.gov.uk/ssi/2017/282/contents/made (Last Accessed 12/06/2023)
[3] https://www.legislation.gov.uk/ssi/2006/209/contents/made (Last Accessed 12/06/2023)

of the PWS. This data was then collected by the land agent and used to inform and update the Council's PWS records. The source locations of PWS were updated, where appropriate, and any properties found to now be served by mains supply were removed from the data set.

Although effort has been made to confirm the PWS, there may still be discrepancies in the data and unrecorded water sources.

## 1.3 Baseline Conditions

The updated PWS data indicated that there are 46 PWS records located within 250m of the proposed working corridor and 1km of the substation. 45 of these supplies were noted to be a Type B PWS, and one of these supplies was noted to be a Type A PWS associated with an operational quarry. These PWS are illustrated within **Figures 7.1a-e.**

Review of the location of the PWS, their catchment areas, and the location of the proposed infrastructure (outlined in **Chapter 7 – Geology, Hydrology, Hydrogeology and Soils**) showed that these PWS are at potential risk of adverse impacts. These PWS will be considered and assessed for their risk levels.

## 1.4 Risk Assessment

The proposed Cable Route Corridor covers an extensive area between New Deer and Peterhead. Within that there are numerous PWS that have been taken into consideration when choosing the proposed Cable Route Corridor and Proposed Substation location, as well as employing a trenchless methodology when near sensitive receptors, to minimise the potential impact on water quality and quantity. These PWS are illustrated within **Figures 7.1a-e.**

The potential for impact on PWS, prior to the implementation of mitigation measures, has been assessed in the table below and considers the proximity to the infrastructure, the topography, and the ground conditions.

**Table 1.1 – PWS identified within the study area**

| No. | Easting | Northing | Location relative to Works | Potential for Impact |
|---|---|---|---|---|
| PWS1 | 410590 | 849339 | Adjacent to Lunderton Cottages, uphill of working corridor. 70m to the north of the proposed working corridor. | Limited potential for impact on source due to intervening distance, limited permeability of the underlying strata and topography. |
| PWS2 | 410581 | 849298 | Adjacent to Luderton Cottages, uphill of working corridor. 28m to the north of the proposed working corridor. | Limited potential for impact on source due to intervening distance, limited permeability of the underlying strata and topography. |
| PWS3 | 408220 | 848799 | Adjacent to Roundhillock Cottage, relatively level with the working corridor. 249m to the north of the proposed working corridor. | Limited potential for impact on source due to intervening distance, limited permeability of the underlying strata and topography. |
| PWS4 | 405099 | 849092 | Located at Wester Rora, uphill of the working corridor. 157m to the north of the proposed working corridor. | Limited potential for impact on source due to intervening distance, limited permeability of the underlying strata and topography. |
| PWS5 | 404392 | 849040 | Located at Millbank, uphill of the working corridor, and is separated by a treeline. 103m to the north of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, distance, limited permeability of the underlying strata and topography. |

| No. | Easting | Northing | Location relative to Works | Potential for Impact |
|---|---|---|---|---|
| PWS6 | 403960 | 849069 | Located at Woodside sand and gravel pits, uphill of the Proposed Development, and is separated by a hedge line. 158m to the north of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, limited permeability of the underlying strata, distance, and topography. |
| PWS7 | 402567 | 848291 | Situated to the south of the working corridor, at the gravel pits at Bridgend, Longside. Water supply is separated from the Proposed Development by field drains and hedge lines. 250m to the south of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, limited permeability of the underlying strata, field drains, and topography. |
| PWS8 | 402330 | 848161 | Supply is located at Crookedneuk Cottages. The supply is relatively level with the Proposed Development, although it is separated by a minor road and treeline. 225m to the east of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, existing road drains, limited permeability of the underlying strata, and distance. |
| PWS9 | 402325 | 848162 | Supply is located at Crookedneuk Cottages. The supply is relatively level with the Proposed Development, although it is separated by a minor road and treeline. 222m to the east of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, existing road drains, limited permeability of the underlying strata, and distance. |
| PWS10 | 402138 | 848260 | Supply for The Beeches is located adjacent to the property and relatively level with the Proposed Development. Although it is separated by a minor road and treeline. 87m to the east of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, existing road drains, limited permeability of the underlying strata, and distance. |
| PWS11 | 402052 | 846534 | 260m to the east of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, existing road drains, limited permeability of the underlying strata, and distance. |
| PWS12 | 402045 | 846545 | Located at Inverquhomery Cottages, uphill from the Proposed Development. The supply is separated from the Proposed Development by several farm tracks and treelines. 255m to the east of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, existing road drains, topography, limited permeability of the underlying strata, and distance. |
| PWS13 | 400094 | 845195 | Source located at Bridgestone, Millbreck, downhill from the Proposed Development. The source is separated from the Proposed Development by a farm track, the A952, and treelines. 258m to the north of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, existing road drains, limited permeability of the underlying strata, and distance. |
| PWS14 | 399010 | 844066 | Adjacent to Brae of Coynach, uphill from the Proposed Development and is separated by a hedge line. 120m to the north of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, limited permeability of the underlying strata, and topography. |
| PWS15 | 398151 | 843040 | Located at Skelmuir Cottages, uphill from the proposed working corridor. The source is separated from the Proposed Development by field drains and a minor road. 222m to the south of the proposed working corridor. | Not considered to be at risk of impact due to intervening field and road drainage, distance, limited permeability of the underlying strata, and topography. |

| No. | Easting | Northing | Location relative to Works | Potential for Impact |
|---|---|---|---|---|
| PWS16 | 398074 | 843490 | The source is situated at Auchtylair, uphill of the proposed working corridor, and is separated by a treeline. 155m to the north of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, limited permeability of the underlying strata, and topography. |
| PWS17 | 397685 | 843076 | Adjacent to South Auchtylair, uphill of the proposed working corridor. This water supply is full encompassed by treelines. 261m to the south of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, limited permeability of the underlying strata, and topography. |
| PWS18 | 397359 | 843191 | Source is located to the east of Kinnadie, uphill of the Proposed Development. 98m to the south of the proposed working corridor. | Limited potential for impact on source due to intervening topography and limited permeability of the underlying strata. |
| PWS19 | 395851 | 843264 | The well is located to the south-east of Slampton and was identified to serve 7 nearby properties through the PWS questionnaire. Situated within the proposed working corridor. | Due to its proximity, there is potential for adverse impacts to occur on this water supply. |
| PWS20 | 394415 | 843989 | Located at Dunbrem, downhill from the proposed working corridor although it is separated by a minor road. 230m to the north-east of the proposed working corridor. | Limited potential for impact on source due to intervening drainage associated with the road, and limited permeability of the underlying strata. |
| PWS21 | 394204 | 843363 | Located in the field to the west of Clochan House, downhill from the Proposed Development. 220m to the south of the proposed working corridor. | There is potential for adverse impacts to occur on this water supply however, this is tempered by the distance, limited permeability of the underlying strata, and limited permeability of the underlying strata. |
| PWS22 | 393971 | 843781 | Situated to the south-east of Clochan Croft House, uphill from the Proposed Development and it is separated by trees and the Woodside Road. 195m to the west of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, road drainage, limited permeability of the underlying strata, and topography. |
| PWS23 | 393021 | 844059 | Located to the west of North Kiddshill, uphill of the Proposed Development. 145m to the south of the proposed working corridor. | Limited potential for impact on source due to intervening topography and limited permeability of the underlying strata. |
| PWS24 | 392824 | 844016 | Located at North Kiddshill, uphill of the Proposed Development, and is separated by a hedge line. 170m to the south of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, limited permeability of the underlying strata, and topography. |
| PWS25 | 392698 | 844818 | Situated at Little Elrick, uphill from the Proposed Development. 250m to the north of the proposed working corridor. | Not considered to be at risk of impact due to intervening distance, limited permeability of the underlying strata, and topography. |
| PWS26 | 392239 | 844441 | Located at North Greenbrae, uphill from the Proposed Development, and it is separated by the Woodside Road. 225m to the south of the proposed working corridor. | Not considered to be at risk of impact due to intervening road drainage, limited permeability of the underlying strata, distance, and topography. |
| PWS27 | 392186 | 844947 | Located at along a surface waterbody, to the south of Teuchtifold. uphill from the Proposed Development. 165m to the north of the proposed working corridor. | Limited potential for impact on source due to intervening topography and limited permeability of the underlying strata. |

| No. | Easting | Northing | Location relative to Works | Potential for Impact |
|---|---|---|---|---|
| PWS28 | 392016 | 844592 | Located at Nethermuir Crossing House, uphill from the Proposed Development. 200m to the south of the proposed working corridor. | Limited potential for impact on source due to intervening topography, limited permeability of the underlying strata, and distance. |
| PWS29 | 391440 | 844665 | Situated at Ashyfolds, uphill from the Proposed Development. The water source is separated from the cable route by a watercourse and an area of woodlands. 250m to the south of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, a watercourse, distance, limited permeability of the underlying strata, and topography. |
| PWS30 | 391369 | 845216 | Located within an area of woodlands, adjacent to the Capelstones and uphill from the Proposed Development. 220m to the north of the proposed working corridor. | Not considered to be at risk of impact due to intervening vegetation, distance, limited permeability of the underlying strata, and topography. |
| PWS31 | 389730 | 845530 | Located to the East of East Auchreddie. The source is located downhill from the Proposed Development although it is separated by the Lang Stracht Road. 195m to the north of the proposed working corridor. | Limited potential for impact on source due to intervening road drainage, limited permeability of the underlying strata, and distance. |
| PWS32 | 389310 | 844910 | Situated at East Mitchellhill. The well source is located uphill of the Proposed Development and separated by a watercourse. 200m to the south of the proposed working corridor. | Not considered to be at risk of impact due to Intervening topography, distance, limited permeability of the underlying strata, and watercourse. |
| PWS33 | 389057 | 844902 | Located at Mitchellhill, uphill from the Proposed Development. 160m to the south of the proposed working corridor. | Limited potential for impact on source due to intervening topography, limited permeability of the underlying strata, and distance. |
| PWS34 | 387081 | 845681 | Located at Tanamara, uphill from the Proposed Development and separated by a minor road. 45m to the north of the proposed working corridor. | There is potential for this water supply to be adversely impacted however, this is limited by the topography, limited permeability of the underlying strata, and the intervening road drainage. |
| PWS35 | 386613 | 845157 | Situated at Eastfield, downhill from the Proposed Development. 207m to the south of the proposed working corridor. | There is potential for this water supply to be adversely impacted however, this is limited by the distance and limited permeability of the underlying strata. |
| PWS36 | 386330 | 845653 | Well source located to the west of Benview, downhill of the Proposed Development. 80m to the north of the proposed working corridor. | There is potential for adverse impacts to occur on this water supply however, this is tempered by the limited permeability of the underlying strata. |
| PWS37 | 385657 | 845601 | Located uphill from the Proposed Development at Earnhill. 161m to the south of the proposed working corridor. | Limited potential for impact on source due to intervening topography, limited permeability of the underlying strata, and distance. |
| PWS38 | 385068 | 845320 | Situated at High Ness, uphill from the Proposed Development. This supply is separated from the cable route by a treeline. 84m to the south-east of the proposed working corridor. | Limited potential for impact on source due to intervening topography, limited permeability of the underlying strata, and vegetation. |
| PWS39 | 384787 | 845004 | Located at Moss-side Croft, downhill from the Proposed Development, although it is separated by a treeline surrounding the property. 180m to the south-east of the proposed working corridor. | Limited potential for impact on source due to intervening vegetation, limited permeability of the underlying strata, and distance. |

| No. | Easting | Northing | Location relative to Works | Potential for Impact |
|---|---|---|---|---|
| PWS40 | 384509 | 844273 | Located adjacent to the bungalow at Cairnbanno House, and is separated from the Proposed Development by the Little Water waterbody and the two minor roads. 690m to the east of the proposed working corridor. | Not considered to be at risk of impact due to Intervening distance, topography, limited permeability of the underlying strata, and watercourse. |
| PWS41 | 384368 | 844155 | Located at Mill House, downhill from the Proposed Development. 600m to the south-east of the proposed working corridor. | Not considered to be at risk of impact due to Intervening distance and limited permeability of the underlying strata. |
| PWS42 | 384050 | 844594 | Situated to the south of Silverlea, and is separated from the Proposed Development by farm access tracks. 190m to the east of the proposed working corridor. | Limited potential for impact on source due to intervening distance, limited permeability of the underlying strata, and access tracks. |
| PWS43 | 383618 | 845171 | Located at north-west of North Asleed, uphill from the Proposed Development. 260m to the north of the proposed working corridor. | Not considered to be at risk of impact due to Intervening distance, limited permeability of the underlying strata, and topography. |
| PWS44 | 383618 | 845171 | The well source is located downhill of the proposed substation and is separated from the Proposed Development by a minor road. 170m to the south of the proposed substation. | Limited potential for impact on source due to intervening drainage associated with the road and limited permeability of the underlying strata. |
| PWS45 | 383344 | 843954 | Situated at East Swanford, uphill from the Proposed Development. The water supply is separated from the Proposed Development by a watercourse. 260m to the north of the proposed working corridor. | Not considered to be at risk of impact due to Intervening distance, limited permeability of the underlying strata, topography, and the separation of a watercourse. |
| PWS46 | 382829 | 844979 | Well source to the east of Smiddybank Farm, uphill from the Proposed Development. The water source is separated from the Proposed Development buy the Burn of Swanford and Burn of Asleid. 580m to the west of the proposed working corridor. | Not considered to be at risk of impact due to Intervening distance, limited permeability of the underlying strata, topography, and the separation of the watercourses. |

## 1.5 Mitigation

PWS have been taken into consideration when choosing the proposed Cable Route Corridor and proposed Substation location. Mitigation measures to be employed on site are discussed in the following sub-sections.

### 1.5.1 Mitigation Types

Material change on the quality and quantity of an existing PWS is defined as either Temporary or Permanent:

- Temporary – A short term adverse impact to the baseline water quality or quantity, that will be resolved once construction is complete, and
- Permanent – A material change to the hydrochemistry or hydrological environment that lasts beyond the construction phase, resulting in an adverse impact to the baseline water quality or quantity.

The following mitigation measures will be implemented to protect PWS during the construction of the Proposed Development and address any potential material changes:

**Table 1.2 – Examples of mitigation measures to protect water quality and quantity**

| Mitigation Type | Mitigation Measures |
|---|---|
| Temporary | • Adherence to PWS monitoring programme to ensure that any change from the baseline water quality and quantity is identified and appropriate protection measures are put in place.<br>• Provide and follow a Private Water Supply Emergency Response Plan (PWSERP).<br>• An alternative potable source of water (e.g., bottled water or additional local PWS) will be provided in case of emergency. |
| Permanent | • Repair damage to existing PWS and provide adequate alternative as soon as possible.<br>• Replace and upgrade existing treatment system for PWS.<br>• Provide an alternative PWS. |

### 1.5.2 PWS Sampling

Should a PWS be deemed at risk of adverse impacts from the Proposed Development, PWS sampling will be implemented to ensure that water management measures are working efficiently to protect the baseline water quality and quantity.

Initially, one water sample will be taken prior to the construction phase to identify the baseline conditions of the PWS. The water source will then be monitored by weekly samples whilst the nearby construction work is being caried out.

This sampling will be enforced and overseen by the Principal Contractor, who will ensure site personnel follow the Private Water Supply Emergency Response Plan (PWSERP) if any adverse impacts on the PWS are identified. The PWSERP will be agreed with Aberdeenshire Council and SEPA prior to the construction phase, should the project gain consent.

### 1.5.3 Construction Methodology

#### Trenchless Cabling

Across sensitive habitats and watercourses, the Proposed Development will employ the use of trenchless methodology such as Horizontal Directional Drilling (HDD), to minimise the potential impact on water quality and quantity. Temporary sheet piling, or equivalent methodology, will also be installed at the proposed trenchless crossing locations, which should further protect the groundwater from potential contaminants.

#### Soil Stripping and Storage

In those areas where trenchless methodology will not be employed, excavations will be made. Prior to excavation, an end-use will be identified for the excavated material and an appropriate storage solution determined accordingly. Stored materials will be kept away from surface water bodies to minimise the possibility for sediments to enter the aquatic environment and PWS.

Soils will be stripped to avoid cross contamination between distinct horizons. Stripped materials will be side- cast or stockpiled for use in the same area as they are excavated from, or they will be stored in appropriately designed and clearly defined separate stockpiles for re-use elsewhere.

Where appropriate, temporary silt fences will be installed to filter runoff that is potentially carrying silt from excavations or stockpiles. This will be effective in protecting surface water quality in adjacent watercourses and eliminate the possibility for silt laden runoff to enter them and any PWS that depend on them.

#### Reinstatement of Excavated Materials

Early reinstatement of excavated materials is required to minimise visual impact, to reduce time required for temporary storage/stockpiling of soils, and to encourage vegetation and habitat restoration as early as possible.

As far as is reasonably practical and achievable, excavated material horizons will be replaced in sequence and depths similar to those recorded prior to excavation, or similar to the surrounding undisturbed ground at the point of reinstatement.

### Dewatering

Dewatering shall be avoided where possible to minimise impacts on sensitive habitat. However, where dewatering is required to enable work in excavated areas, it will temporarily lower the water table.

Details of the pre-construction ground investigation will include an assessment of the ground permeability and water potential; the results will be used to inform any dewatering required on site.

Where dewatering is required, it shall comply with the Abstraction Regime of CAR General Binding Rule (GBR) 2 and GBR 15.

### Enhanced sedimentation control

To avoid potential impacts on sensitive habitats, any potential runoff will be appropriately treated prior to discharge into the natural environment. This will keep clean runoff separate from contaminated runoff to avoid further contamination and maintain the associated drainage capacity, which will mitigate the possibility of contaminants entering watercourses and impacting the aquatic environments and PWS.

These mechanisms of clean water cut-off ditches, sediment capture, and infiltration trenches, are intended to reduce the speed of flow, filter runoff, and allow suspended silts and particulates to settle out naturally thus minimising the potential impacts upon downstream aquatic environments, or nearby PWS.

## 1.5.4 General Site Pollution Control

To reduce and minimise pollution incidents on site, appropriate monitoring of pollution prevention procedures will be undertaken by the appointed Principal Contractor. They will ensure that 'Good Practice' is followed, and that an Emergency Contacts Notice is displayed where it can be easily accessed.

Best practice procedures in the handling, use and storage of fuel, oils, and chemicals will be adhered to at all times.

With regard to vehicles, fleet vehicles entering the site will be regularly checked and maintained to prevent leakage of contaminants. Concrete will be premixed offsite and delivery wagons will only be washed out in areas where suitable control measures are in place. The concrete used will be of a high grade that is not prone to leaching alkalis. The number of onsite vehicles will be highest during construction. The ongoing risk of pollution on the site after construction is considered to be very low.

Prior to construction, an Environmental Management Plan (CEMP) and a Pollution Prevention Plan (PPP) will be put in place, adhering to the standards set out by Aberdeenshire Council and SEPA. These documents will outline mitigation measures to reduce or nullify potential impacts on the ground and surface water environment.

The CEMP and PPP will address the following issues:

- Contractor Duties
- Tool Box Talks
- Pollution Prevention and Mitigation
- COSHH
- Pollution Monitoring & Controls
- Site Waste Management Plan

The Principal Contractor will undertake the appropriate monitoring of any mitigation and pollution prevention procedures to ensure they are adequately implemented and will conduct a full review of any pollution incidents. This will determine the effectiveness of the response procedures and highlight areas of improvement.

Avoiding and preventing any pollution incidents will be the primary focus. Should an incident occur, the next step will be to reduce any potential pollution that may occur and ensure that nearby properties and residents have access to potable water.

There will be a clear and detailed record of any accidents, incidents, and near misses. These will be reported to the Site Manager and other necessary staff for investigation. The report will include a description of the incident, the cause, any detrimental impacts, and the mitigation steps and measures to be employed.

## 1.6 Emergency Contact Details

Residents of properties that could be affected will be provided with the emergency contact details of the following:

- Contact name and number for the Developer;
- Contact name and number for the Principal Contractor; and
- Contact name and number for the Environmental Health Department at the Council.

## 1.7 Summary

46 PWS have been identified within the Study Area based on information from the council and public consultation with nearby residents. These PWS have been included in the risk assessment.

With consideration to the suggested mitigation and good practises to be employed on site, it is anticipated that any potential pollution or adverse affects can be limited to a manageable level.

GREEN VOLT

# Appendix 8.1

## Wester Rora Groundsure Report

Onshore EIA Report: Volume 3

Groundsure
LOCATION INTELLIGENCE

Enviro
Insight

# Wester Rora,

## Order Details

**Date:** 14/04/2023

**Your ref:** E5475_6_PO19981

**Our Ref:** GCR-2S6-V1A-FLQ-UQU

## Site Details

**Location:** 405280 848855

**Area:** 9.99 ha

**Authority:** Aberdeenshire Council






Contact us with any questions at:
info@groundsure.com
01273 257 755

# Summary of findings

| Page | Section | Past land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **11** | **1.1** | **Historical industrial land uses** | 0 | 0 | 0 | 5 | - |
| **12** | **1.2** | **Historical tanks** | 0 | 0 | 0 | 2 | - |
| 12 | 1.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 13 | 1.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 13 | 1.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| 13 | 1.6 | Historical military land | 0 | 0 | 0 | 0 | - |
| Page | Section | Past land use - un-grouped | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **14** | **2.1** | **Historical industrial land uses** | 0 | 0 | 0 | 5 | - |
| **15** | **2.2** | **Historical tanks** | 0 | 0 | 0 | 2 | - |
| 15 | 2.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 15 | 2.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 16 | 2.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| Page | Section | Waste and landfill | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 17 | 3.1 | Active or recent landfill | 0 | 0 | 0 | 0 | - |
| 17 | 3.2 | Historical landfill (BGS records) | 0 | 0 | 0 | 0 | - |
| 17 | 3.3 | Historical landfill (LA/mapping records) | 0 | 0 | 0 | 0 | - |
| 17 | 3.4 | Licensed waste sites | 0 | 0 | 0 | 0 | - |
| 17 | 3.5 | Historical waste sites | 0 | 0 | 0 | 0 | - |
| Page | Section | Current industrial land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **18** | **4.1** | **Recent industrial land uses** | 2 | 0 | 3 | - | - |
| 19 | 4.2 | Current or recent petrol stations | 0 | 0 | 0 | 0 | - |
| 19 | 4.3 | Electricity cables | 0 | 0 | 0 | 0 | - |
| 19 | 4.4 | Gas pipelines | 0 | 0 | 0 | 0 | - |
| 19 | 4.5 | Sites determined as Contaminated Land | 0 | 0 | 0 | 0 | - |
| 20 | 4.6 | Control of Major Accident Hazards (COMAH) | 0 | 0 | 0 | 0 | - |
| 20 | 4.7 | Regulated explosive sites | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 20 | 4.8 | Hazardous substance storage/usage | 0 | 0 | 0 | 0 | - |
| 20 | 4.9 | Part A(1), IPPC and Historic IPC Authorisations | 0 | 0 | 0 | 0 | - |
| 20 | 4.10 | Part B Authorisations | 0 | 0 | 0 | 0 | - |
| 21 | 4.11 | Pollution inventory substances | 0 | 0 | 0 | 0 | - |
| 21 | 4.12 | Pollution inventory waste transfers | 0 | 0 | 0 | 0 | - |
| 21 | 4.13 | Pollution inventory radioactive waste | 0 | 0 | 0 | 0 | - |
| Page | Section | Geology (basic) | | | | | |
| 22 | 5.1 | Superficial geology (625k) | Identified (within 500m) | | | | |
| 22 | 5.2 | Bedrock geology (625k) | Identified (within 500m) | | | | |
| Page | Section | Hydrogeology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 23 | 6.1 | Superficial aquifer | Identified (within 500m) | | | | |
| 24 | 6.2 | Bedrock aquifer | Identified (within 500m) | | | | |
| Page | Section | Hydrology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 26 | 7.1 | Water Network (OS MasterMap) | 0 | 3 | 3 | - | - |
| 27 | 7.2 | Surface water features | 0 | 2 | 2 | - | - |
| Page | Section | River flooding | | | | | |
| 28 | 8.1 | River flooding | 1 in 30 year, 0.3m - 1.0m (within 50m) | | | | |
| Page | Section | Coastal flooding | | | | | |
| 30 | 9.1 | Coastal flooding | Negligible (within 50m) | | | | |
| Page | Section | Surface water flooding | | | | | |
| 31 | 10.1 | Surface water flooding | 1 in 30 year, 0.3m - 1.0m (within 50m) | | | | |
| Page | Section | Groundwater flooding | | | | | |
| 33 | 11.1 | Groundwater flooding | Moderate (within 50m) | | | | |
| Page | Section | Environmental designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 34 | 12.1 | Sites of Special Scientific Interest (SSSI) | 0 | 0 | 0 | 0 | 0 |
| 34 | 12.2 | Conserved wetland sites (Ramsar sites) | 0 | 0 | 0 | 0 | 0 |
| 34 | 12.3 | Special Areas of Conservation (SAC) | 0 | 0 | 0 | 0 | 0 |
| 34 | 12.4 | Special Protection Areas (SPA) | 0 | 0 | 0 | 0 | 0 |
| 35 | 12.5 | National Nature Reserves (NNR) | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 35 | 12.6 | Local Nature Reserves (LNR) | 0 | 0 | 0 | 0 | 0 |
| 35 | 12.7 | Designated Ancient Woodland | 0 | 0 | 0 | 0 | 0 |
| 35 | 12.8 | Biosphere Reserves | 0 | 0 | 0 | 0 | 0 |
| 36 | 12.9 | Forest Parks | 0 | 0 | 0 | 0 | 0 |
| 36 | 12.10 | Marine Conservation Zones | 0 | 0 | 0 | 0 | 0 |
| Page | Section | Visual and cultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 37 | 13.1 | World Heritage Sites | 0 | 0 | 0 | - | - |
| 37 | 13.2 | Area of Outstanding Natural Beauty | 0 | 0 | 0 | - | - |
| 37 | 13.3 | National Parks | 0 | 0 | 0 | - | - |
| 37 | 13.4 | Listed Buildings | 0 | 0 | 0 | - | - |
| 38 | 13.5 | Conservation Areas | 0 | 0 | 0 | - | - |
| 38 | 13.6 | Scheduled Ancient Monuments | 0 | 0 | 0 | - | - |
| 38 | 13.7 | Registered Parks and Gardens | 0 | 0 | 0 | - | - |
| Page | Section | Agricultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **39** | **14.1** | **Agricultural Land Classification** | Grade 3.2 (within 250m) | | | | |

## Recent aerial photograph


Capture Date: 29/05/2018

Site Area: 9.99ha

# Recent site history - 2014 aerial photograph


Capture Date: 20/04/2014

Site Area: 9.99ha

# Recent site history - 2005 aerial photograph


Capture Date: 03/09/2005

Site Area: 9.99ha

# Recent site history - 2003 aerial photograph


Capture Date: 13/07/2003

Site Area: 9.99ha

# Recent site history - 2001 aerial photograph


Capture Date: 01/01/2001

Site Area: 9.99ha

## OS MasterMap site plan


Site Area: 9.99ha

# 1 Past land use




Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

## 1.1 Historical industrial land uses

| Records within 500m | 5 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 11**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| A | 289m E | Old Canal | 1902 | 1295271 |

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| A | 301m E | Disused Canal | 1870 | 1294975 |
| B | 466m N | Sand Pit | 1870 | 1294396 |
| B | 466m N | Unspecified Pit | 1955 | 1294027 |
| B | 467m N | Gravel Pit | 1902 | 1294227 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.2 Historical tanks

| **Records within 500m** | **2** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 11**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| 1 | 464m S | Tank or Trough | 1870 | 197682 |
| 2 | 479m SE | Tank or Trough | 1870 | 197686 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.3 Historical energy features

| **Records within 500m** | **0** |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.5 Historical garages

| Records within 500m | 0 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.6 Historical military land

| Records within 500m | 0 |
|---|---|

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

*This data is sourced from Ordnance Survey / Groundsure / other sources.*

# 2 Past land use - un-grouped




Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

## 2.1 Historical industrial land uses

| Records within 500m | 5 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 14**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| A | 289m E | Old Canal | 1902 | 1295271 |
| A | 301m E | Disused Canal | 1870 | 1294975 |
| B | 466m N | Sand Pit | 1870 | 1294396 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| B | 466m N | Unspecified Pit | 1955 | 1294027 |
| B | 467m N | Gravel Pit | 1902 | 1294227 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.2 Historical tanks

| **Records within 500m** | **2** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 14**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| 1 | 464m S | Tank or Trough | 1870 | 197682 |
| 2 | 479m SE | Tank or Trough | 1870 | 197686 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.3 Historical energy features

| **Records within 500m** | **0** |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.4 Historical petrol stations

| **Records within 500m** | **0** |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.5 Historical garages

| Records within 500m | 0 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

# 3 Waste and landfill

## 3.1 Active or recent landfill

| Records within 500m | 0 |
|---|---|

Active or recently closed landfill sites under Scottish Environment Protection (SEPA) regulation.

*This data is sourced from the Scottish Environment Protection Agency.*

## 3.2 Historical landfill (BGS records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

*This data is sourced from the British Geological Survey.*

## 3.3 Historical landfill (LA/mapping records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified from Local Authority records and high detail historical mapping.

*This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.*

## 3.4 Licensed waste sites

| Records within 500m | 0 |
|---|---|

Active or recently closed waste sites under Scottish Environment Protection Acency (SEPA) regulation.

*This data is sourced from the Scottish Environment Protection Agency.*

## 3.5 Historical waste sites

| Records within 500m | 0 |
|---|---|

Waste site records derived from Local Authority planning records and high detail historical mapping.

*This data is sourced from Ordnance Survey/Groundsure and Local Authority records.*

# 4 Current industrial land use




Site Outline

Search buffers in metres (m)

Recent industrial land uses

## 4.1 Recent industrial land uses

| Records within 250m | 5 |
|---|---|

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 18**

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| **1** | **On site** | **Gravel and Sand Workings** | **Aberdeenshire, AB42** | **Sand, Gravel and Clay Extraction and Merchants** | **Extractive Industries** |
| **2** | **On site** | **Tank** | **Aberdeenshire, AB42** | **Tanks (Generic)** | **Industrial Features** |

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| A | 246m E | Monyruy 1 Turbine | Aberdeenshire, AB42 | Energy Production | Industrial Features |
| A | 246m E | Monyruy 1 | Longside, Peterhead, Aberdeenshire, AB42 | Energy Production | Industrial Features |
| A | 247m E | Wind Turbine | Aberdeenshire, AB42 | Energy Production | Industrial Features |

*This data is sourced from Ordnance Survey.*

## 4.2 Current or recent petrol stations

| Records within 500m | 0 |
|---|---|

Open, closed, under development and obsolete petrol stations.

*This data is sourced from Experian.*

## 4.3 Electricity cables

| Records within 500m | 0 |
|---|---|

High voltage underground electricity transmission cables.

*This data is sourced from National Grid.*

## 4.4 Gas pipelines

| Records within 500m | 0 |
|---|---|

High pressure underground gas transmission pipelines.

*This data is sourced from National Grid.*

## 4.5 Sites determined as Contaminated Land

| Records within 500m | 0 |
|---|---|

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

*This data is sourced from Local Authority records.*

## 4.6 Control of Major Accident Hazards (COMAH)

| Records within 500m | 0 |
|---|---|

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

*This data is sourced from the Health and Safety Executive.*

## 4.7 Regulated explosive sites

| Records within 500m | 0 |
|---|---|

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

*This data is sourced from the Health and Safety Executive.*

## 4.8 Hazardous substance storage/usage

| Records within 500m | 0 |
|---|---|

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

*This data is sourced from Local Authority records.*

## 4.9 Part A(1), IPPC and Historic IPC Authorisations

| Records within 500m | 0 |
|---|---|

Records of Part A installations regulated for the release of substances to the environment.

*This data is sourced from the Scottish Environment Protection Agency.*

## 4.10 Part B Authorisations

| Records within 500m | 0 |
|---|---|

Records of Part B installations regulated for the release of substances to the environment.

*This data is sourced from the Scottish Environment Protection Agency.*

## 4.11 Pollution inventory substances

| Records within 500m | 0 |
|---|---|

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.12 Pollution inventory waste transfers

| Records within 500m | 0 |
|---|---|

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.13 Pollution inventory radioactive waste

| Records within 500m | 0 |
|---|---|

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

# 5 Geology (basic)

## 5.1 Superficial geology (625k)

| Records within 500m | 4 |
|---|---|

Generalised geology data based on BGS's published poster maps of the UK (North and South). Superficial related themes digitised from 1977 first edition Quaternary map (North and South).

| Location | Lex code | Description | Rock type |
|---|---|---|---|
| **On site** | **GSG-SAGR** | **GLACIAL SAND AND GRAVEL** | **SAND AND GRAVEL** |
| **On site** | **TILL-DMTN** | **TILL** | **DIAMICTON** |
| 5m SE | ALV-CLSS | ALLUVIUM | CLAY, SILT AND SAND |
| 482m SE | GSG-SAGR | GLACIAL SAND AND GRAVEL | SAND AND GRAVEL |

*This data is sourced from the British Geological Survey.*

## 5.2 Bedrock geology (625k)

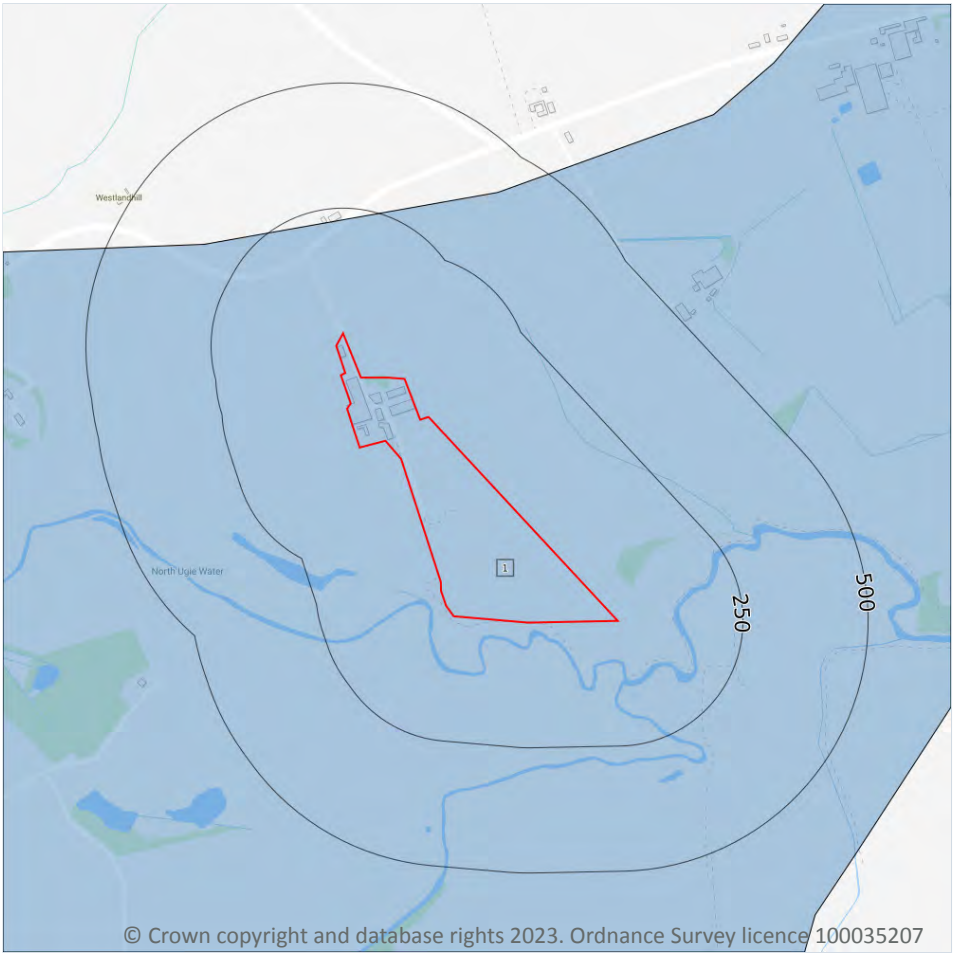
| Records within 500m | 2 |
|---|---|

Generalised geology data based on BGS's published poster maps of the UK (North and South). Bedrock related themes created through generalisation of 1:50,000 data.

| Location | Lex code | Description | Rock type |
|---|---|---|---|
| **On site** | **ARGY-PSP** | **ARGYLL GROUP** | **PSAMMITE, SEMIPELITE AND PELITE** |
| 118m S | UIIOS-FELSR | UNNAMED IGNEOUS INTRUSION, ORDOVICIAN TO SILURIAN | FELSIC-ROCK |

*This data is sourced from the British Geological Survey.*

# 6 Hydrogeology - Superficial aquifer




Site Outline

Search buffers in metres (m)

Limited or local potential

Locally important - intergranular

## 6.1 Superficial aquifer

| Records within 500m | 1 |
|---|---|

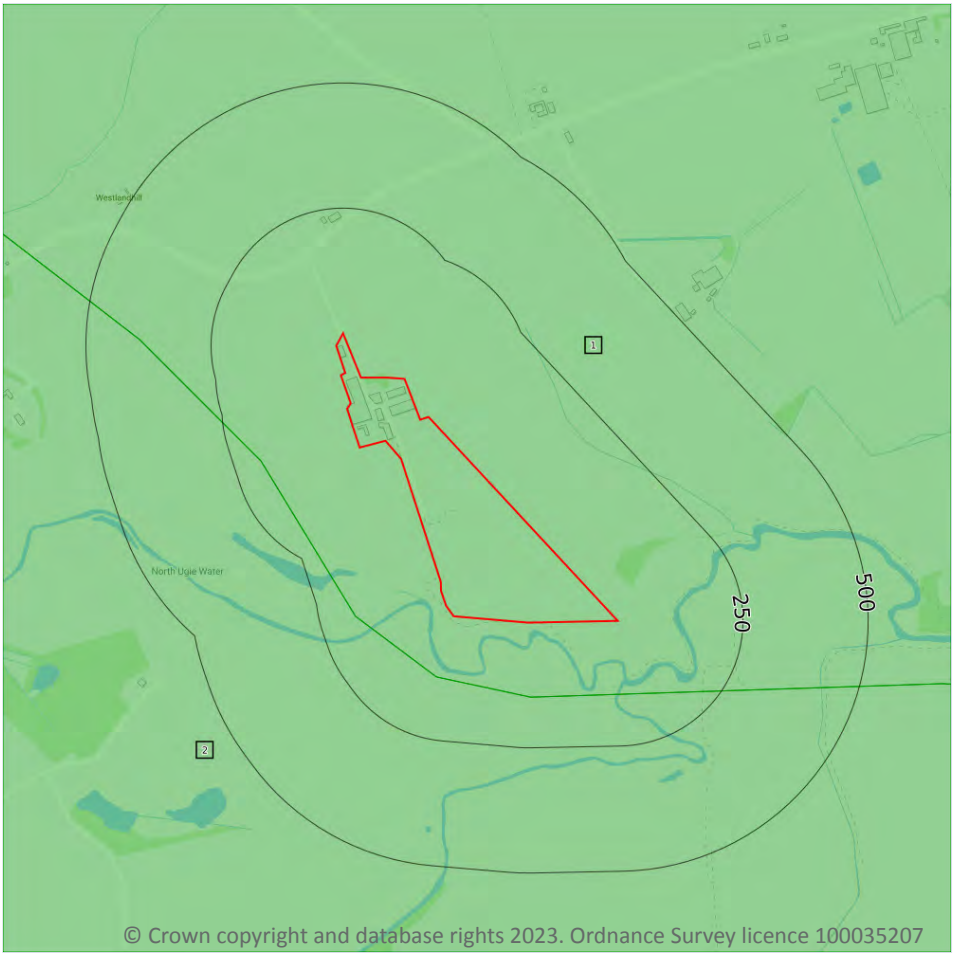
Records of groundwater classification within superficial geology.

Features are displayed on the Hydrogeology map on **page 23**

| ID | Location | Description | Type | Rock description |
|---|---|---|---|---|
| **1** | **On site** | **Concealed aquifers, aquifers of limited potential, regions without significant groundwater** | **Concealed aquifers; aquifers with limited or local potential** | **Quaternary Coastal and Fluviatile Alluvium** |

*This data is sourced from the British Geological Survey.*

# Bedrock aquifer




Site Outline

Search buffers in metres (m)

- Highly productive - fissures/discontinuities
- Highly productive - intergranular
- Moderately productive - fissures/discontinuities
- Moderately productive - intergranular
- Low productive - fissures/discontinuities
- Low productive - intergranular
- No significant groundwater

## 6.2 Bedrock aquifer

| Records within 500m | 2 |
|---|---|

Records of groundwater classification within bedrock geology.

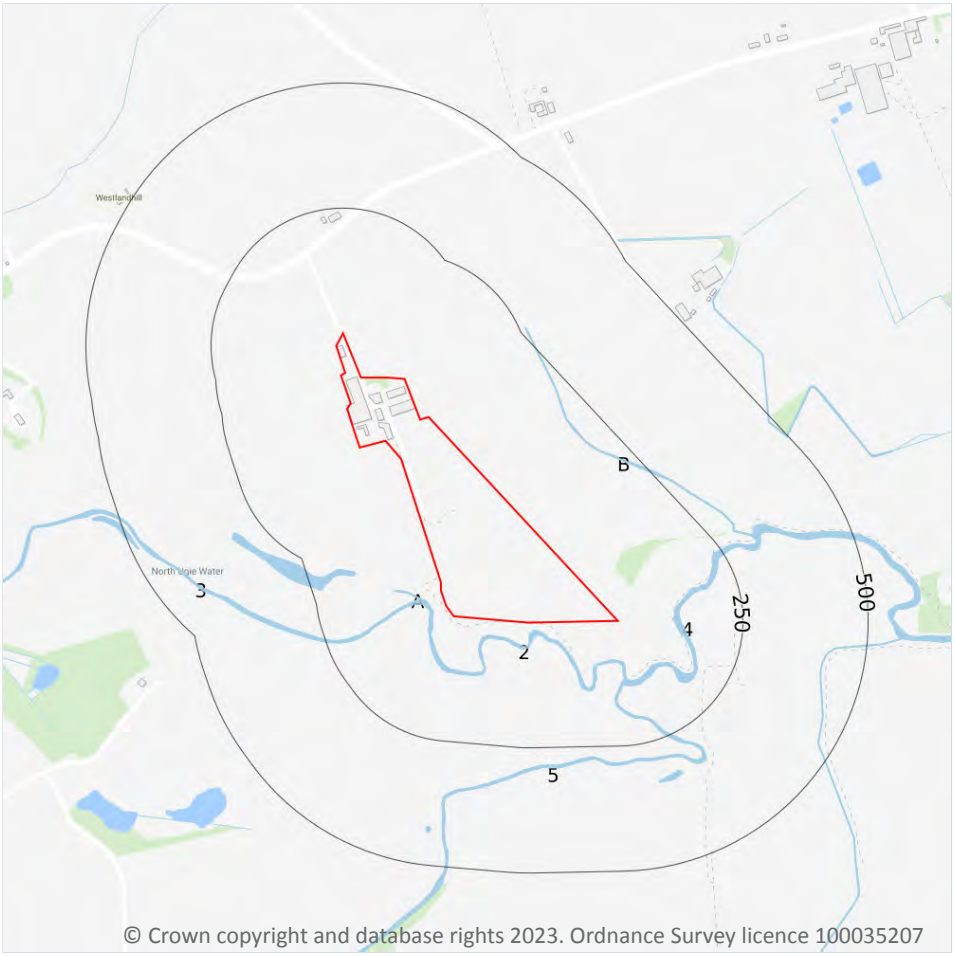
Features are displayed on the Bedrock aquifer map on **page 24**

| ID | Location | Description | Flow | Summary | Rock description |
|---|---|---|---|---|---|
| **1** | **On site** | **Low productivity aquifer** | **Flow is virtually all through fractures and other discontinuities** | **Small amounts of groundwater in near surface weathered zone and fractures.** | **ARGYLL GROUP** |

| ID | Location | Description | Flow | Summary | Rock description |
|---|---|---|---|---|---|
| 2 | 118m S | Low productivity aquifer | Flow is virtually all through fractures and other discontinuities | Small amounts of groundwater in near surface weathered zone and secondary fractures; rare springs. | UNNAMED IGNEOUS INTRUSION, ORDOVICIAN TO SILURIAN |

*This data is sourced from the British Geological Survey.*

# 7 Hydrology






Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

## 7.1 Water Network (OS MasterMap)

| Records within 250m | 6 |
|---|---|

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 26**

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| 2 | 20m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | North Ugie Water |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| A | 42m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| 3 | 45m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | North Ugie Water |
| 4 | 115m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | River Ugie |
| 5 | 125m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | South Ugie Water |
| B | 195m NE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

*This data is sourced from the Ordnance Survey.*

## 7.2 Surface water features

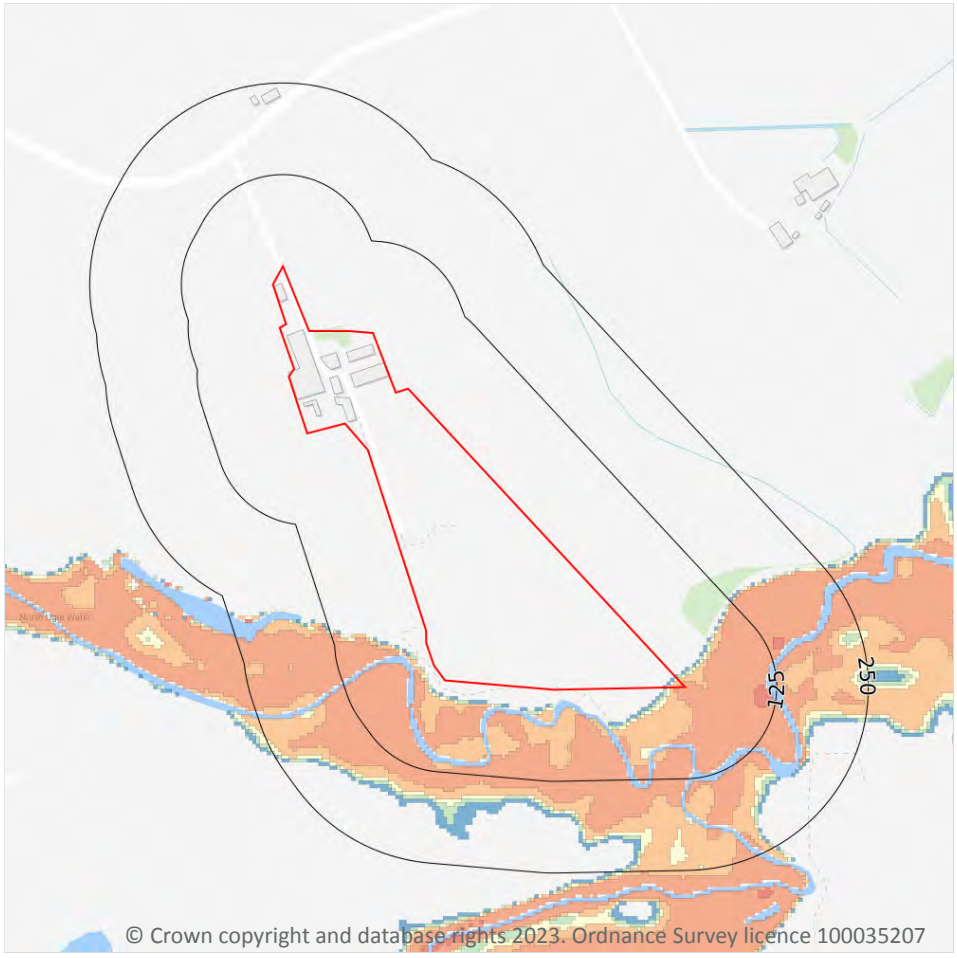
| **Records within 250m** | **4** |
|---|---|

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 26**

*This data is sourced from the Ordnance Survey.*

# 8 River flooding




Site Outline
Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

## 8.1 River flooding

| | |
|---|---|
| **Highest risk on site** | **1 in 30 year, 0.3m - 1.0m** |
| **Highest risk within 50m** | **1 in 30 year, 0.3m - 1.0m** |

This is an assessment of flood risk for rivers in Scotland produced using modelled data, provided by Ambiental Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of flooding from rivers presented in the following categories:

- 1 in 30 year (3.33%)
- 1 in 100 year (1%)

- 1 in 250 year (0.4%)
- and 1 in 1,000 year (0.1%)

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

Features are displayed on the River flooding map on **page 28**

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Between 0.3m and 1.0m |
| 1 in 250 year | Between 0.3m and 1.0m |
| 1 in 100 year | Between 0.3m and 1.0m |
| 1 in 30 year | Between 0.3m and 1.0m |

*This data is sourced from Ambiental Risk Analytics.*

# 9 Coastal flooding - Coastal flooding

## 9.1 Coastal flooding

| | |
|---|---|
| **Highest risk on site** | **Negligible** |
| **Highest risk within 50m** | **Negligible** |

This is an assessment of coastal flood risk in Scotland produced using modelled data, provided by Ambiental Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of coastal flooding presented in the following categories:

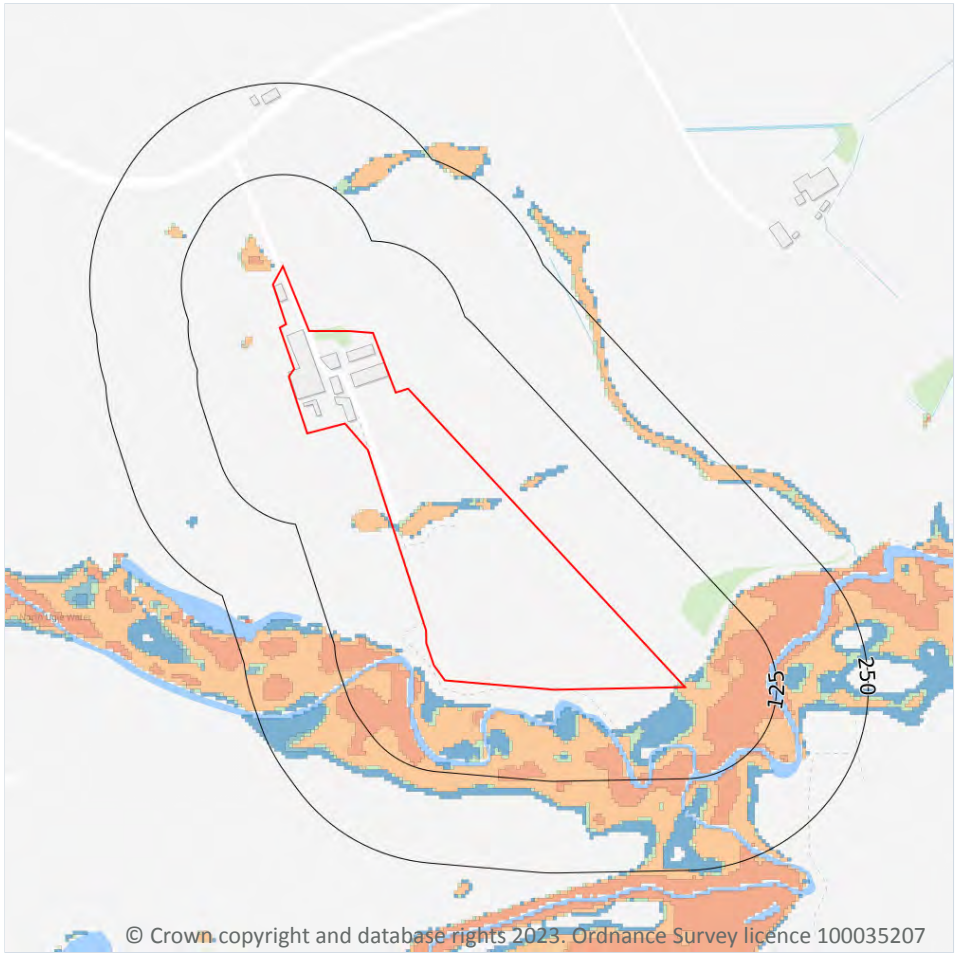
- 1 in 30 year (3.33%)
- 1 in 100 year (1%)
- 1 in 250 year (0.4%)
- and 1 in 1,000 year (0.1%)

The data shown on the map shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Negligible |
| 1 in 250 year | Negligible |
| 1 in 100 year | Negligible |
| 1 in 30 year | Negligible |

*This data is sourced from Ambiental Risk Analytics.*

# 10 Surface water flooding




Site Outline
Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

## 10.1 Surface water flooding

| | |
|---|---|
| **Highest risk on site** | **1 in 30 year, 0.1m - 0.3m** |
| **Highest risk within 50m** | **1 in 30 year, 0.3m - 1.0m** |

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 31**

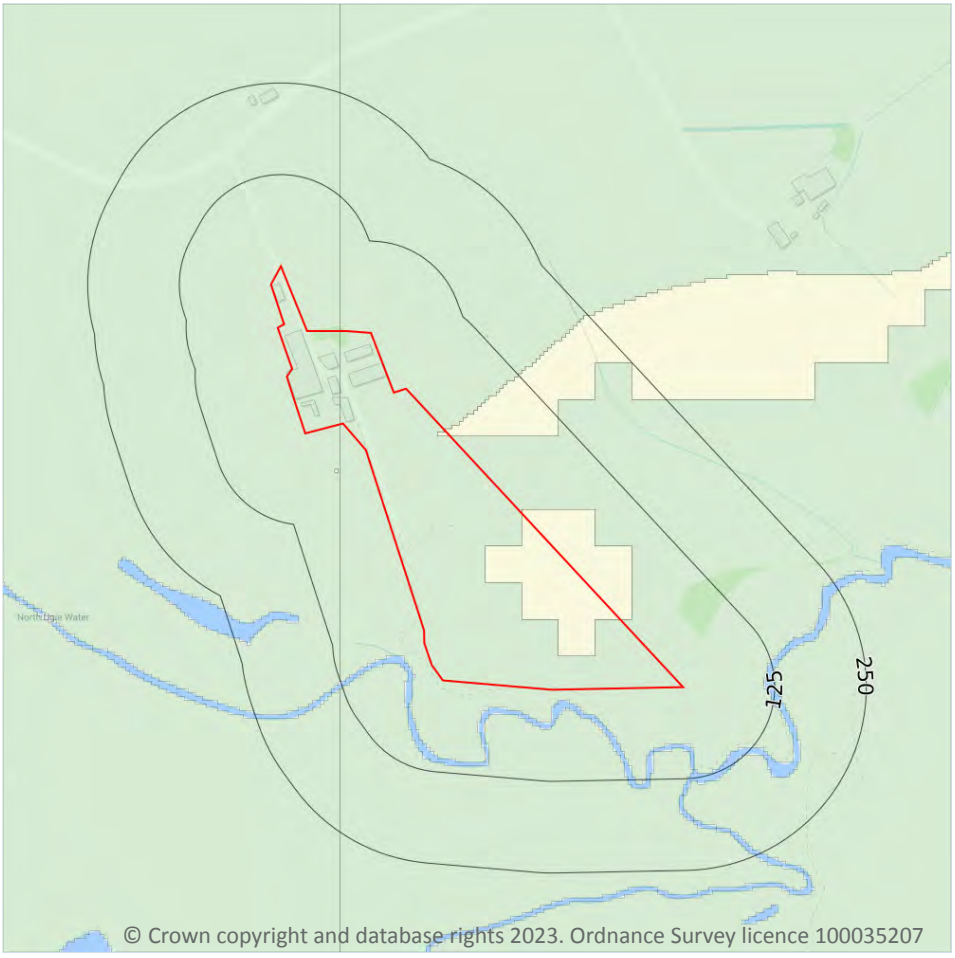
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on

a site. The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Between 0.3m and 1.0m |
| 1 in 250 year | Between 0.1m and 0.3m |
| 1 in 100 year | Between 0.1m and 0.3m |
| 1 in 30 year | Between 0.1m and 0.3m |

*This data is sourced from Ambiental Risk Analytics.*

# 11 Groundwater flooding




Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

## 11.1 Groundwater flooding

| | |
|---|---|
| **Highest risk on site** | **Moderate** |
| **Highest risk within 50m** | **Moderate** |

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 33**

*This data is sourced from Ambiental Risk Analytics.*

# 12 Environmental designations

## 12.1 Sites of Special Scientific Interest (SSSI)

| Records within 2000m | 0 |
|---|---|

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.2 Conserved wetland sites (Ramsar sites)

| Records within 2000m | 0 |
|---|---|

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.3 Special Areas of Conservation (SAC)

| Records within 2000m | 0 |
|---|---|

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.4 Special Protection Areas (SPA)

| Records within 2000m | 0 |
|---|---|

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.5 National Nature Reserves (NNR)

| Records within 2000m | 0 |
|---|---|

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.6 Local Nature Reserves (LNR)

| Records within 2000m | 0 |
|---|---|

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.7 Designated Ancient Woodland

| Records within 2000m | 0 |
|---|---|

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.8 Biosphere Reserves

| Records within 2000m | 0 |
|---|---|

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.9 Forest Parks

| Records within 2000m | 0 |
|---|---|

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

*This data is sourced from the Forestry Commission.*

## 12.10 Marine Conservation Zones

| Records within 2000m | 0 |
|---|---|

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

# 13 Visual and cultural designations

## 13.1 World Heritage Sites

| Records within 250m | 0 |
|---|---|

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.2 Area of Outstanding Natural Beauty

| Records within 250m | 0 |
|---|---|

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 13.3 National Parks

| Records within 250m | 0 |
|---|---|

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

*This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.*

## 13.4 Listed Buildings

| Records within 250m | 0 |
|---|---|

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.5 Conservation Areas

| Records within 250m | 0 |
|---|---|

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.6 Scheduled Ancient Monuments

| Records within 250m | 0 |
|---|---|

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

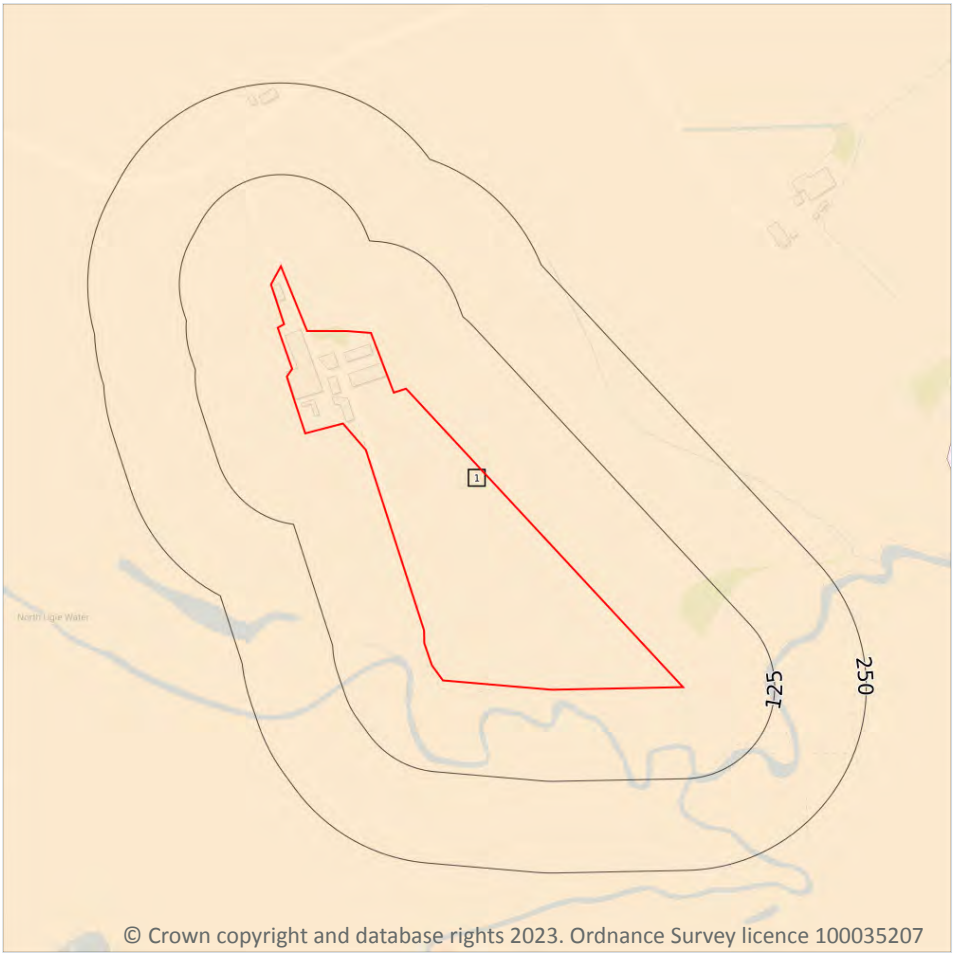
## 13.7 Registered Parks and Gardens

| Records within 250m | 0 |
|---|---|

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

# 14 Agricultural designations






Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 4 - good quality
- Grade 5 - moderate quality
- Grade 6 - poor quality
- Grade 7 - very poor quality

## 14.1 Agricultural Land Classification

| Records within 250m | 1 |
|---|---|

Classification of the quality of agricultural land taking into consideration multiple factors inclusing climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 39**

| ID | Location | Classification | Description |
|---|---|---|---|
| 1 | **On site** | **Grade 3.2** | **Land Suited to Arable Cropping** |

*This data is sourced from the James Hutton Institute.*

## Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

## Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: https://www.groundsure.com/terms-and-conditions-april-2023/.

GREEN VOLT

# Appendix 8.2

## Sandyknapps Groundsure Report

Onshore EIA Report: Volume 3

Groundsure
LOCATION INTELLIGENCE

Enviro
Insight

Sandyknapps,

## Order Details

**Date:** 14/04/2023

**Your ref:** E5475_5_PO19981

**Our Ref:** GCR-SVB-2N2-KMH-64B

## Site Details

**Location:** 403815 849013

**Area:** 8.36 ha

**Authority:** Aberdeenshire Council





Contact us with any questions at:
info@groundsure.com
01273 257 755

# Summary of findings

| Page | Section | Past land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **11** | **1.1** | **Historical industrial land uses** | 2 | 0 | 1 | 5 | - |
| **12** | **1.2** | **Historical tanks** | 0 | 0 | 1 | 0 | - |
| 12 | 1.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 13 | 1.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 13 | 1.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| 13 | 1.6 | Historical military land | 0 | 0 | 0 | 0 | - |
| Page | Section | Past land use - un-grouped | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **14** | **2.1** | **Historical industrial land uses** | 3 | 0 | 1 | 8 | - |
| **15** | **2.2** | **Historical tanks** | 0 | 0 | 1 | 0 | - |
| 15 | 2.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 16 | 2.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 16 | 2.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| Page | Section | Waste and landfill | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 17 | 3.1 | Active or recent landfill | 0 | 0 | 0 | 0 | - |
| 17 | 3.2 | Historical landfill (BGS records) | 0 | 0 | 0 | 0 | - |
| 17 | 3.3 | Historical landfill (LA/mapping records) | 0 | 0 | 0 | 0 | - |
| 17 | 3.4 | Licensed waste sites | 0 | 0 | 0 | 0 | - |
| 17 | 3.5 | Historical waste sites | 0 | 0 | 0 | 0 | - |
| Page | Section | Current industrial land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **18** | **4.1** | **Recent industrial land uses** | 1 | 0 | 4 | - | - |
| 19 | 4.2 | Current or recent petrol stations | 0 | 0 | 0 | 0 | - |
| 19 | 4.3 | Electricity cables | 0 | 0 | 0 | 0 | - |
| 19 | 4.4 | Gas pipelines | 0 | 0 | 0 | 0 | - |
| 19 | 4.5 | Sites determined as Contaminated Land | 0 | 0 | 0 | 0 | - |
| 20 | 4.6 | Control of Major Accident Hazards (COMAH) | 0 | 0 | 0 | 0 | - |
| 20 | 4.7 | Regulated explosive sites | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 20 | 4.8 | Hazardous substance storage/usage | 0 | 0 | 0 | 0 | - |
| **20** | **4.9** | **Part A(1), IPPC and Historic IPC Authorisations** | 0 | 0 | 1 | 0 | - |
| 21 | 4.10 | Part B Authorisations | 0 | 0 | 0 | 0 | - |
| 21 | 4.11 | Pollution inventory substances | 0 | 0 | 0 | 0 | - |
| 21 | 4.12 | Pollution inventory waste transfers | 0 | 0 | 0 | 0 | - |
| 21 | 4.13 | Pollution inventory radioactive waste | 0 | 0 | 0 | 0 | - |
| Page | Section | Geology (basic) | | | | | |
| **22** | **5.1** | **Superficial geology (625k)** | Identified (within 500m) | | | | |
| **22** | **5.2** | **Bedrock geology (625k)** | Identified (within 500m) | | | | |
| Page | Section | Hydrogeology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **23** | **6.1** | **Superficial aquifer** | Identified (within 500m) | | | | |
| **24** | **6.2** | **Bedrock aquifer** | Identified (within 500m) | | | | |
| Page | Section | Hydrology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **26** | **7.1** | **Water Network (OS MasterMap)** | 10 | 3 | 20 | - | - |
| **29** | **7.2** | **Surface water features** | 1 | 3 | 18 | - | - |
| Page | Section | River flooding | | | | | |
| 30 | 8.1 | River flooding | Negligible (within 50m) | | | | |
| Page | Section | Coastal flooding | | | | | |
| 31 | 9.1 | Coastal flooding | Negligible (within 50m) | | | | |
| Page | Section | Surface water flooding | | | | | |
| **32** | **10.1** | **Surface water flooding** | 1 in 30 year, 0.3m - 1.0m (within 50m) | | | | |
| Page | Section | Groundwater flooding | | | | | |
| **34** | **11.1** | **Groundwater flooding** | Moderate (within 50m) | | | | |
| Page | Section | Environmental designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 35 | 12.1 | Sites of Special Scientific Interest (SSSI) | 0 | 0 | 0 | 0 | 0 |
| 35 | 12.2 | Conserved wetland sites (Ramsar sites) | 0 | 0 | 0 | 0 | 0 |
| 35 | 12.3 | Special Areas of Conservation (SAC) | 0 | 0 | 0 | 0 | 0 |
| 35 | 12.4 | Special Protection Areas (SPA) | 0 | 0 | 0 | 0 | 0 |
| 36 | 12.5 | National Nature Reserves (NNR) | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 36 | 12.6 | Local Nature Reserves (LNR) | 0 | 0 | 0 | 0 | 0 |
| 36 | 12.7 | Designated Ancient Woodland | 0 | 0 | 0 | 0 | 0 |
| 36 | 12.8 | Biosphere Reserves | 0 | 0 | 0 | 0 | 0 |
| 37 | 12.9 | Forest Parks | 0 | 0 | 0 | 0 | 0 |
| 37 | 12.10 | Marine Conservation Zones | 0 | 0 | 0 | 0 | 0 |
| Page | Section | Visual and cultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 38 | 13.1 | World Heritage Sites | 0 | 0 | 0 | - | - |
| 38 | 13.2 | Area of Outstanding Natural Beauty | 0 | 0 | 0 | - | - |
| 38 | 13.3 | National Parks | 0 | 0 | 0 | - | - |
| 38 | 13.4 | Listed Buildings | 0 | 0 | 0 | - | - |
| 39 | 13.5 | Conservation Areas | 0 | 0 | 0 | - | - |
| 39 | 13.6 | Scheduled Ancient Monuments | 0 | 0 | 0 | - | - |
| 39 | 13.7 | Registered Parks and Gardens | 0 | 0 | 0 | - | - |
| Page | Section | Agricultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **40** | **14.1** | **Agricultural Land Classification** | Grade 5.3 (within 250m) | | | | |

## Recent aerial photograph


Capture Date: 29/05/2018

Site Area: 8.36ha

# Recent site history - 2014 aerial photograph


Capture Date: 20/04/2014

Site Area: 8.36ha

## Recent site history - 2005 aerial photograph


Capture Date: 03/09/2005

Site Area: 8.36ha

## Recent site history - 2003 aerial photograph


Capture Date: 13/07/2003

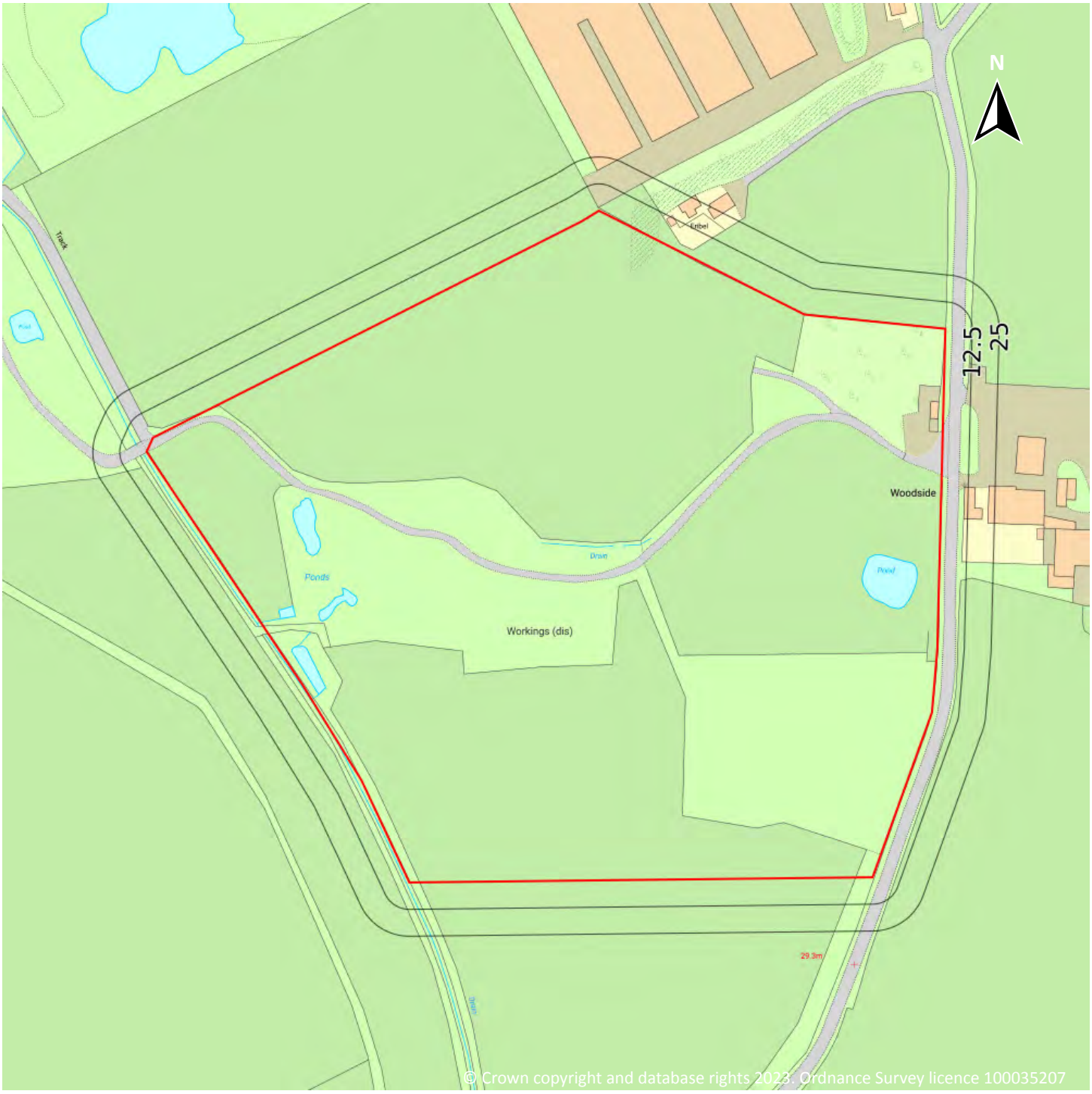
Site Area: 8.36ha

# Recent site history - 2001 aerial photograph


Capture Date: 01/01/2001

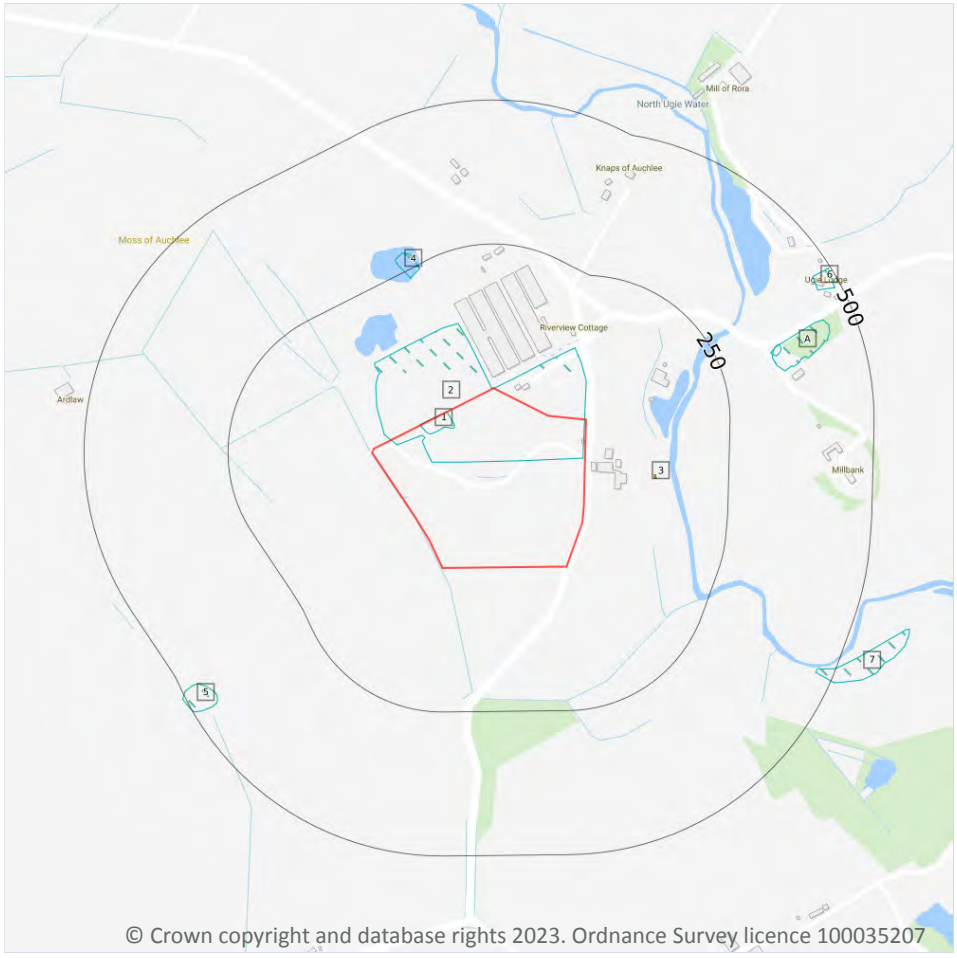
Site Area: 8.36ha

## OS MasterMap site plan




Site Area: 8.36ha

# 1 Past land use






Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

## 1.1 Historical industrial land uses

| Records within 500m | 8 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 11**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| **1** | **On site** | **Gravel Pit** | **1902 - 1955** | **1294799** |

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| **2** | **On site** | **Gravel Pit** | **1973** | **1294856** |
| 4 | 236m N | Sand Pit | 1973 | 1294388 |
| A | 341m NE | Unspecified Quarry | 1955 - 1973 | 1294672 |
| A | 341m NE | Gravel Pit | 1902 | 1294228 |
| 5 | 449m SW | Unspecified Quarry | 1902 - 1955 | 1295110 |
| 6 | 461m NE | Unspecified Mill | 1902 - 1955 | 1294670 |
| 7 | 470m SE | Unspecified Pit | 1902 | 1294024 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.2 Historical tanks

| **Records within 500m** | **1** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 11**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| 3 | 121m E | Tank or Trough | 1870 | 197680 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.3 Historical energy features

| **Records within 500m** | **0** |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.5 Historical garages

| Records within 500m | 0 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

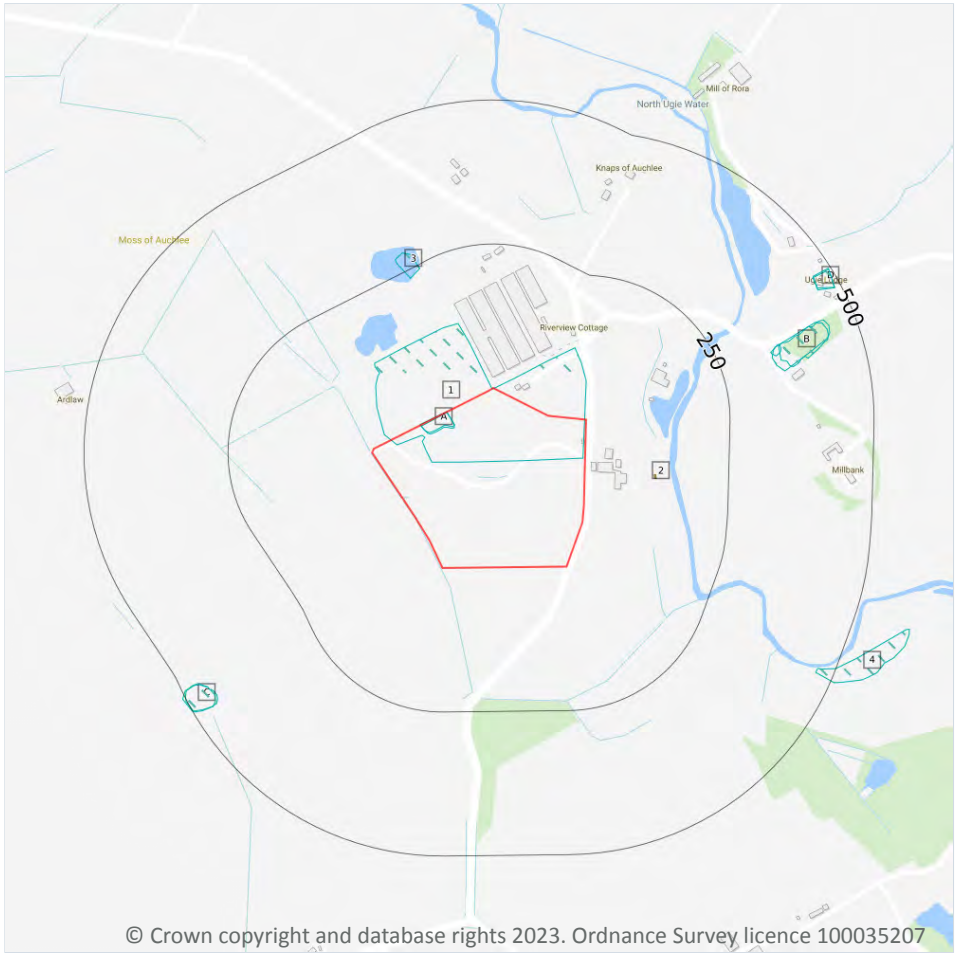
## 1.6 Historical military land

| Records within 500m | 0 |
|---|---|

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

*This data is sourced from Ordnance Survey / Groundsure / other sources.*

# 2 Past land use - un-grouped






Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

## 2.1 Historical industrial land uses

| Records within 500m | 12 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 14**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| **1** | **On site** | **Gravel Pit** | **1973** | **1294856** |
| **A** | **On site** | **Gravel Pit** | **1955** | **1294799** |
| **A** | **On site** | **Gravel Pit** | **1902** | **1294799** |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| 3 | 236m N | Sand Pit | 1973 | 1294388 |
| B | 341m NE | Unspecified Quarry | 1955 | 1294672 |
| B | 341m NE | Gravel Pit | 1902 | 1294228 |
| B | 354m NE | Unspecified Quarry | 1973 | 1294672 |
| C | 449m SW | Unspecified Quarry | 1955 | 1295110 |
| C | 452m SW | Unspecified Quarry | 1902 | 1295110 |
| D | 461m NE | Unspecified Mill | 1902 | 1294670 |
| D | 462m NE | Unspecified Mill | 1955 | 1294670 |
| 4 | 470m SE | Unspecified Pit | 1902 | 1294024 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.2 Historical tanks

| **Records within 500m** | **1** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 14**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| 2 | 121m E | Tank or Trough | 1870 | 197680 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.3 Historical energy features

| **Records within 500m** | **0** |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.5 Historical garages

| Records within 500m | 0 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

# 3 Waste and landfill

## 3.1 Active or recent landfill

| Records within 500m | 0 |
|---|---|

Active or recently closed landfill sites under Scottish Environment Protection (SEPA) regulation.

*This data is sourced from the Scottish Environment Protection Agency.*

## 3.2 Historical landfill (BGS records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

*This data is sourced from the British Geological Survey.*

## 3.3 Historical landfill (LA/mapping records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified from Local Authority records and high detail historical mapping.

*This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.*

## 3.4 Licensed waste sites

| Records within 500m | 0 |
|---|---|

Active or recently closed waste sites under Scottish Environment Protection Acency (SEPA) regulation.

*This data is sourced from the Scottish Environment Protection Agency.*

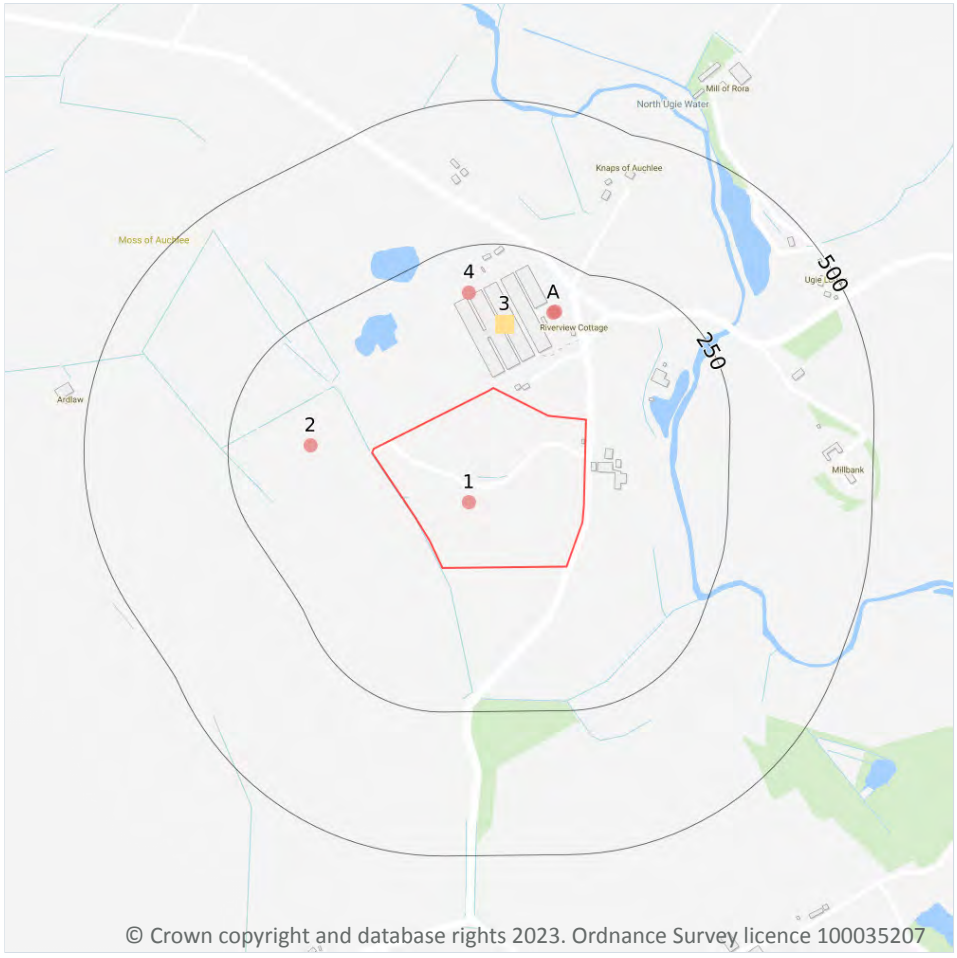
## 3.5 Historical waste sites

| Records within 500m | 0 |
|---|---|

Waste site records derived from Local Authority planning records and high detail historical mapping.

*This data is sourced from Ordnance Survey/Groundsure and Local Authority records.*

# 4 Current industrial land use






Site Outline

Search buffers in metres (m)

Recent industrial land uses

Part A(1), IPPC and Historic IPC

## 4.1 Recent industrial land uses

| Records within 250m | 5 |
|---|---|

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 18**

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| **1** | **On site** | **Workings (Dis)** | **Aberdeenshire, AB42** | **Unspecified Quarries Or Mines** | **Extractive Industries** |
| 2 | 108m W | Workings (Dis) | Aberdeenshire, AB42 | Unspecified Quarries Or Mines | Extractive Industries |
| A | 164m N | Tank | Aberdeenshire, AB42 | Tanks (Generic) | Industrial Features |

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| A | 166m N | Tank | Aberdeenshire, AB42 | Tanks (Generic) | Industrial Features |
| 4 | 171m N | Poultry Houses | Aberdeenshire, AB42 | Poultry Farming, Equipment and Supplies | Farming |

*This data is sourced from Ordnance Survey.*

## 4.2 Current or recent petrol stations

| Records within 500m | 0 |
|---|---|

Open, closed, under development and obsolete petrol stations.

*This data is sourced from Experian.*

## 4.3 Electricity cables

| Records within 500m | 0 |
|---|---|

High voltage underground electricity transmission cables.

*This data is sourced from National Grid.*

## 4.4 Gas pipelines

| Records within 500m | 0 |
|---|---|

High pressure underground gas transmission pipelines.

*This data is sourced from National Grid.*

## 4.5 Sites determined as Contaminated Land

| Records within 500m | 0 |
|---|---|

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

*This data is sourced from Local Authority records.*

## 4.6 Control of Major Accident Hazards (COMAH)

| Records within 500m | 0 |
|---|---|

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

*This data is sourced from the Health and Safety Executive.*

## 4.7 Regulated explosive sites

| Records within 500m | 0 |
|---|---|

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

*This data is sourced from the Health and Safety Executive.*

## 4.8 Hazardous substance storage/usage

| Records within 500m | 0 |
|---|---|

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

*This data is sourced from Local Authority records.*

## 4.9 Part A(1), IPPC and Historic IPC Authorisations

| Records within 500m | 1 |
|---|---|

Records of Part A installations regulated for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 18**

| ID | Location | Address | Operator | Processes undertaken | License reference |
|---|---|---|---|---|---|
| 3 | 112m N | Sandyknapps Poultry Farm, Longside, Peterhead, AB42 4UD | Grampian Country Chickens (Rearing) Limited | Intensive Farming - Poultry Rearing | PPC/A/1016791 |

*This data is sourced from the Scottish Environment Protection Agency.*

## 4.10 Part B Authorisations

| Records within 500m | 0 |
|---|---|

Records of Part B installations regulated for the release of substances to the environment.

*This data is sourced from the Scottish Environment Protection Agency.*

## 4.11 Pollution inventory substances

| Records within 500m | 0 |
|---|---|

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.12 Pollution inventory waste transfers

| Records within 500m | 0 |
|---|---|

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.13 Pollution inventory radioactive waste

| Records within 500m | 0 |
|---|---|

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

# 5 Geology (basic)

## 5.1 Superficial geology (625k)

| Records within 500m | 4 |
|---|---|

Generalised geology data based on BGS's published poster maps of the UK (North and South). Superficial related themes digitised from 1977 first edition Quaternary map (North and South).

| Location | Lex code | Description | Rock type |
|---|---|---|---|
| **On site** | **GSG-SAGR** | **GLACIAL SAND AND GRAVEL** | **SAND AND GRAVEL** |
| **On site** | **ALV-CLSS** | **ALLUVIUM** | **CLAY, SILT AND SAND** |
| 199m NE | TILL-DMTN | TILL | DIAMICTON |
| 402m E | GSG-SAGR | GLACIAL SAND AND GRAVEL | SAND AND GRAVEL |

*This data is sourced from the British Geological Survey.*

## 5.2 Bedrock geology (625k)

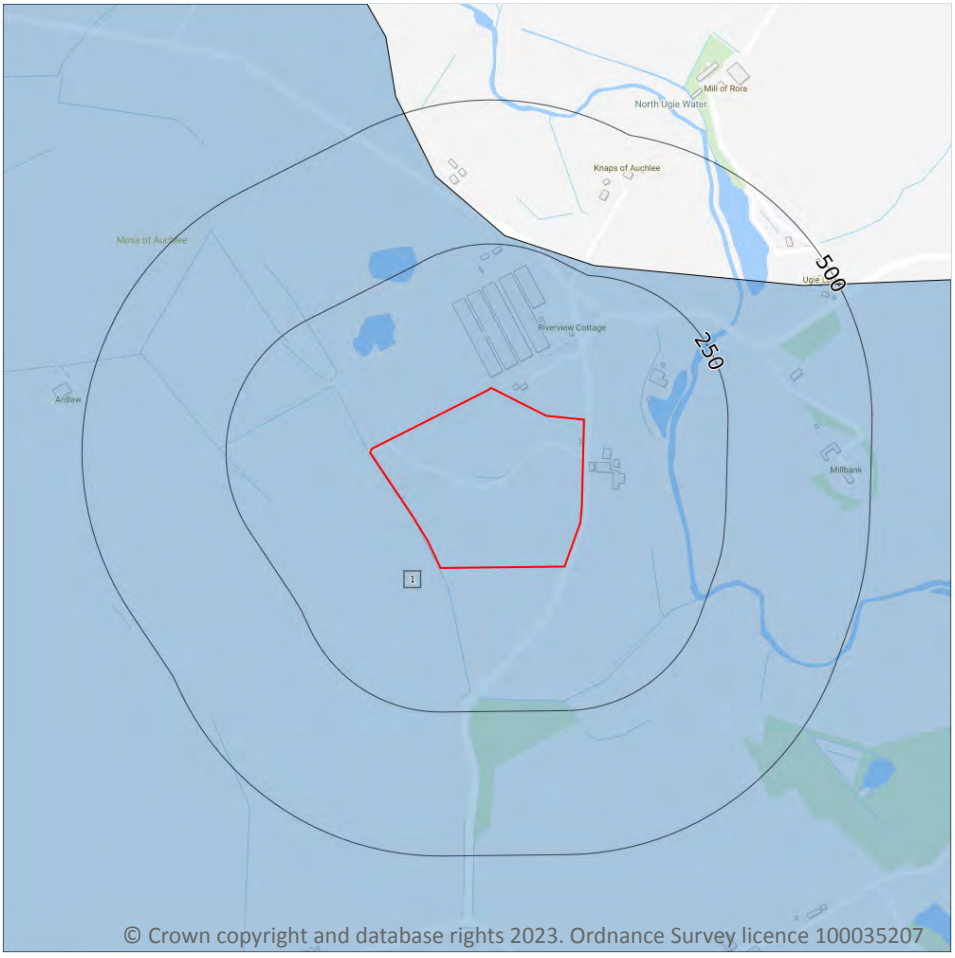
| Records within 500m | 2 |
|---|---|

Generalised geology data based on BGS's published poster maps of the UK (North and South). Bedrock related themes created through generalisation of 1:50,000 data.

| Location | Lex code | Description | Rock type |
|---|---|---|---|
| **On site** | **UIIOS-FELSR** | **UNNAMED IGNEOUS INTRUSION, ORDOVICIAN TO SILURIAN** | **FELSIC-ROCK** |
| 414m W | ARGY-PSP | ARGYLL GROUP | PSAMMITE, SEMIPELITE AND PELITE |

*This data is sourced from the British Geological Survey.*

# 6 Hydrogeology - Superficial aquifer




Site Outline

Search buffers in metres (m)

Limited or local potential

Locally important - intergranular

## 6.1 Superficial aquifer

| Records within 500m | 1 |
|---|---|

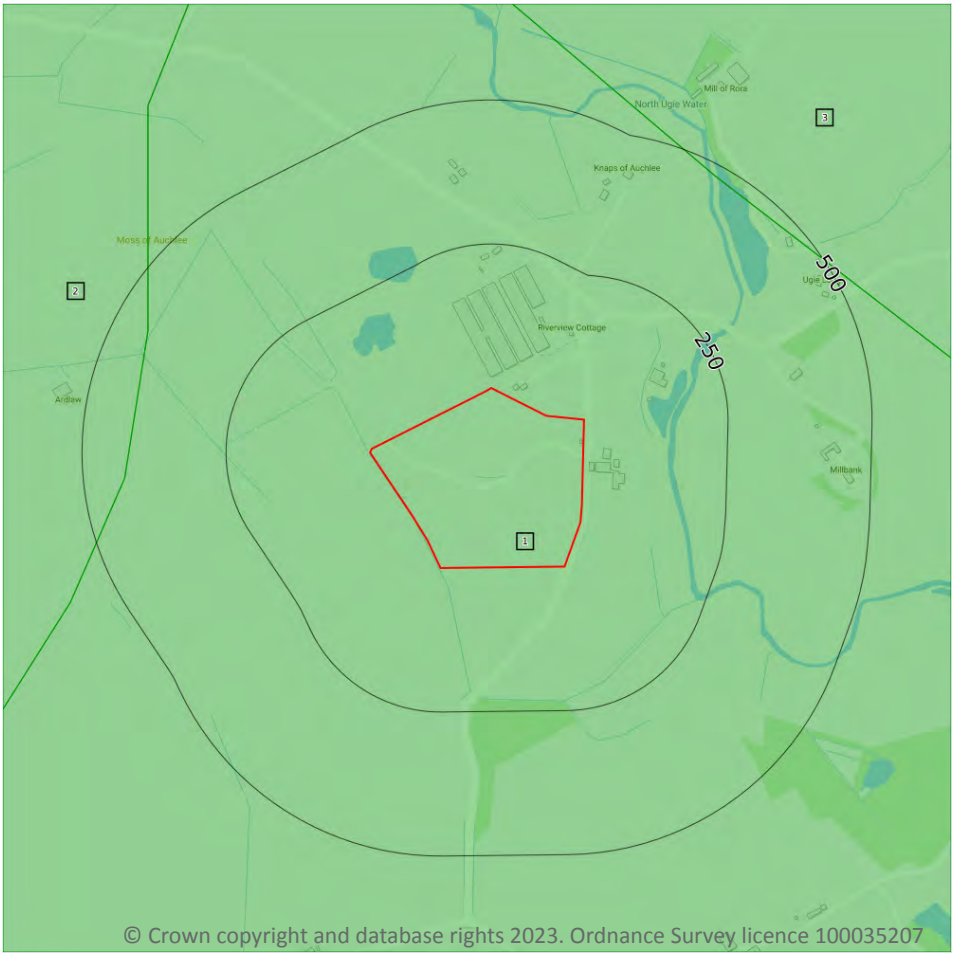
Records of groundwater classification within superficial geology.

Features are displayed on the Hydrogeology map on **page 23**

| ID | Location | Description | Type | Rock description |
|---|---|---|---|---|
| 1 | On site | Concealed aquifers, aquifers of limited potential, regions without significant groundwater | Concealed aquifers; aquifers with limited or local potential | Quaternary Coastal and Fluviatile Alluvium |

*This data is sourced from the British Geological Survey.*

# Bedrock aquifer






Site Outline

Search buffers in metres (m)

- Highly productive - fissures/discontinuities
- Highly productive - intergranular
- Moderately productive - fissures/discontinuities
- Moderately productive - intergranular
- Low productive - fissures/discontinuities
- Low productive - intergranular
- No significant groundwater

## 6.2 Bedrock aquifer

| Records within 500m | 3 |
|---|---|

Records of groundwater classification within bedrock geology.

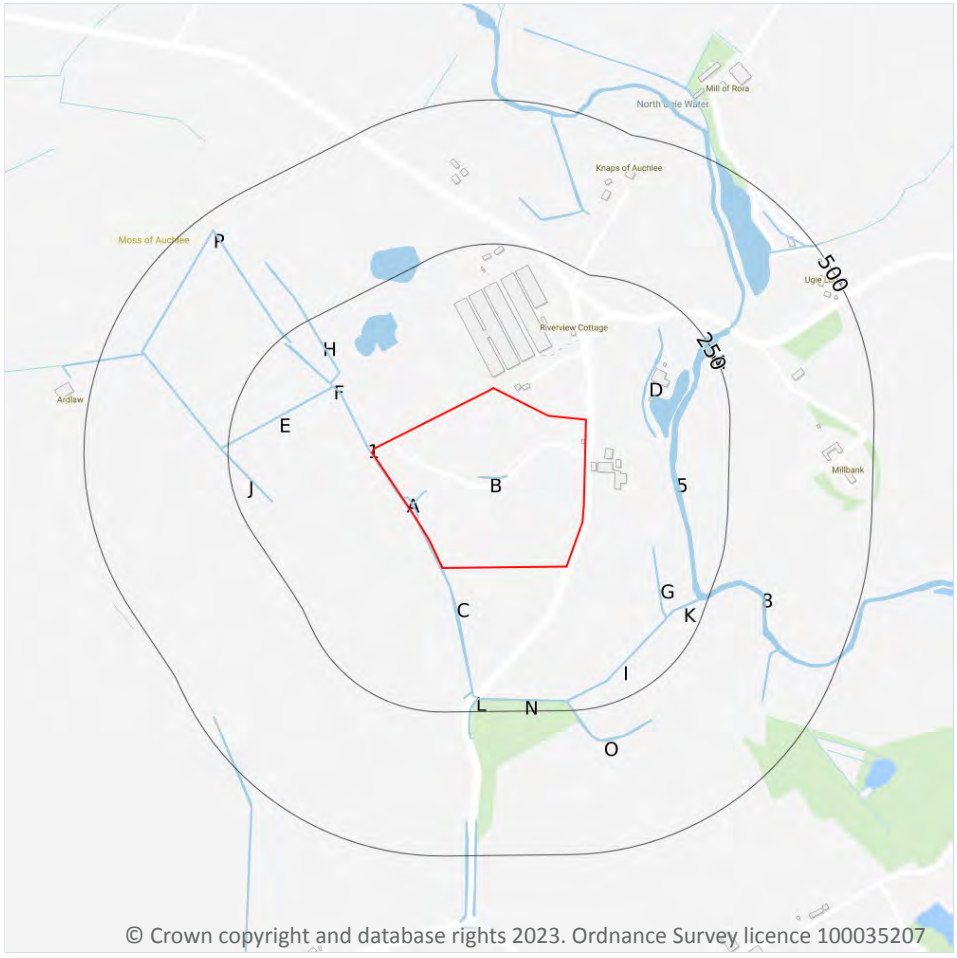
Features are displayed on the Bedrock aquifer map on **page 24**

| ID | Location | Description | Flow | Summary | Rock description |
|---|---|---|---|---|---|
| **1** | **On site** | **Low productivity aquifer** | **Flow is virtually all through fractures and other discontinuities** | **Small amounts of groundwater in near surface weathered zone and secondary fractures; rare springs.** | **UNNAMED IGNEOUS INTRUSION, ORDOVICIAN TO SILURIAN** |

| ID | Location | Description | Flow | Summary | Rock description |
|---|---|---|---|---|---|
| 2 | 414m W | Low productivity aquifer | Flow is virtually all through fractures and other discontinuities | Small amounts of groundwater in near surface weathered zone and fractures. | ARGYLL GROUP |
| 3 | 474m NE | Low productivity aquifer | Flow is virtually all through fractures and other discontinuities | Small amounts of groundwater in near surface weathered zone and fractures. | ARGYLL GROUP |

*This data is sourced from the British Geological Survey.*

# 7 Hydrology






Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

## 7.1 Water Network (OS MasterMap)

| Records within 250m | 33 |
|---|---|

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 26**

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| **A** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| **A** | **On site** | **Lake, loch or reservoir.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **A** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **A** | **On site** | **Inland river not influenced by normal tidal action.** | **Underground** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **A** | **On site** | **Lake, loch or reservoir.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **A** | **On site** | **Inland river not influenced by normal tidal action.** | **Underground** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **A** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **B** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **B** | **On site** | **Inland river not influenced by normal tidal action.** | **Underground** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **B** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **C** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **A** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| 1 | 1m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| D | 101m NE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| E | 128m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| F | 128m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| G | 130m E | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| H | 137m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| H | 137m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| 5 | 151m E | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | North Ugie Water |
| I | 187m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| J | 192m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| K | 195m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| L | 215m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| L | 215m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| M | 219m NE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | North Ugie Water |
| M | 219m NE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | North Ugie Water |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| L | 227m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| N | 227m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| O | 233m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| P | 233m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| K | 235m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| 8 | 237m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | North Ugie Water |

*This data is sourced from the Ordnance Survey.*

## 7.2 Surface water features

| **Records within 250m** | **22** |
|---|---|

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 26**

*This data is sourced from the Ordnance Survey.*

# 8 River flooding

## 8.1 River flooding

| | |
|---|---|
| **Highest risk on site** | **Negligible** |
| **Highest risk within 50m** | **Negligible** |

This is an assessment of flood risk for rivers in Scotland produced using modelled data, provided by Ambiental Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of flooding from rivers presented in the following categories:

- 1 in 30 year (3.33%)
- 1 in 100 year (1%)
- 1 in 250 year (0.4%)
- and 1 in 1,000 year (0.1%)

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Negligible |
| 1 in 250 year | Negligible |
| 1 in 100 year | Negligible |
| 1 in 30 year | Negligible |

*This data is sourced from Ambiental Risk Analytics.*

# 9 Coastal flooding - Coastal flooding

## 9.1 Coastal flooding

| | |
|---|---|
| **Highest risk on site** | **Negligible** |
| **Highest risk within 50m** | **Negligible** |

This is an assessment of coastal flood risk in Scotland produced using modelled data, provided by Ambiental Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of coastal flooding presented in the following categories:

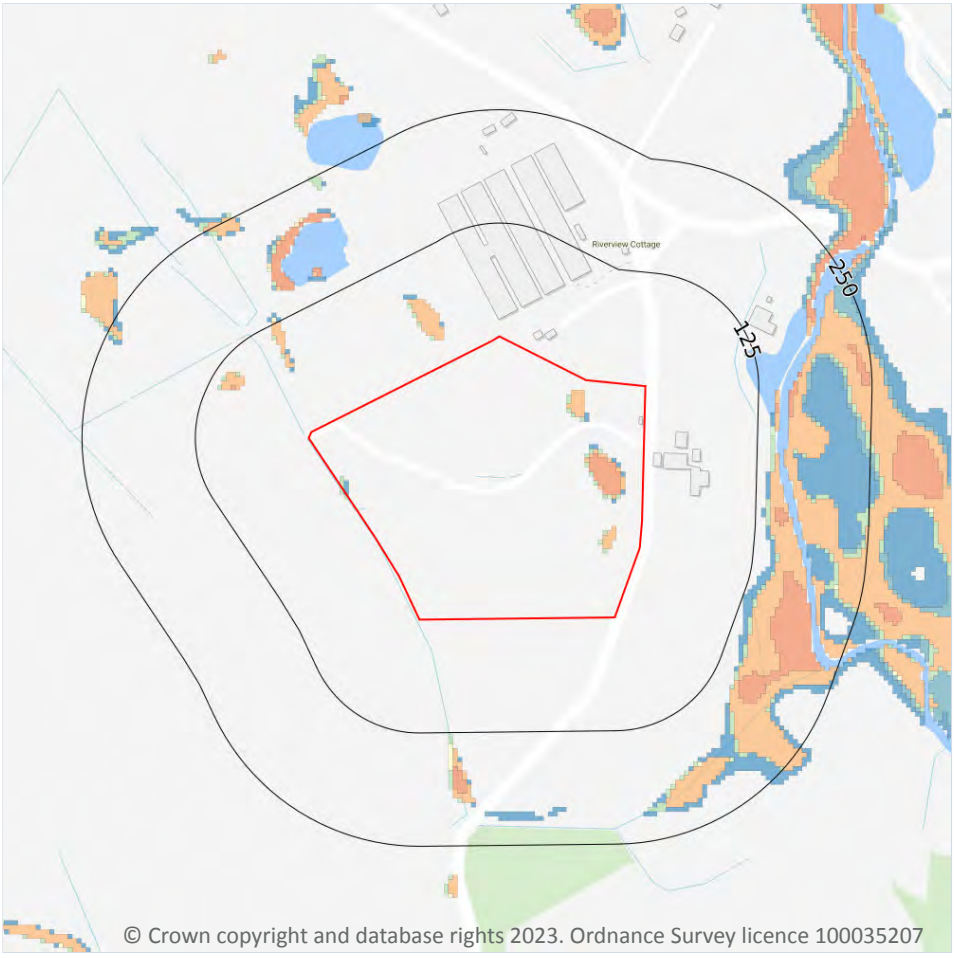
- 1 in 30 year (3.33%)
- 1 in 100 year (1%)
- 1 in 250 year (0.4%)
- and 1 in 1,000 year (0.1%)

The data shown on the map shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Negligible |
| 1 in 250 year | Negligible |
| 1 in 100 year | Negligible |
| 1 in 30 year | Negligible |

*This data is sourced from Ambiental Risk Analytics.*

# 10 Surface water flooding




Site Outline

Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

## 10.1 Surface water flooding

| | |
|---|---|
| **Highest risk on site** | **1 in 30 year, 0.3m - 1.0m** |
| **Highest risk within 50m** | **1 in 30 year, 0.3m - 1.0m** |

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 32**

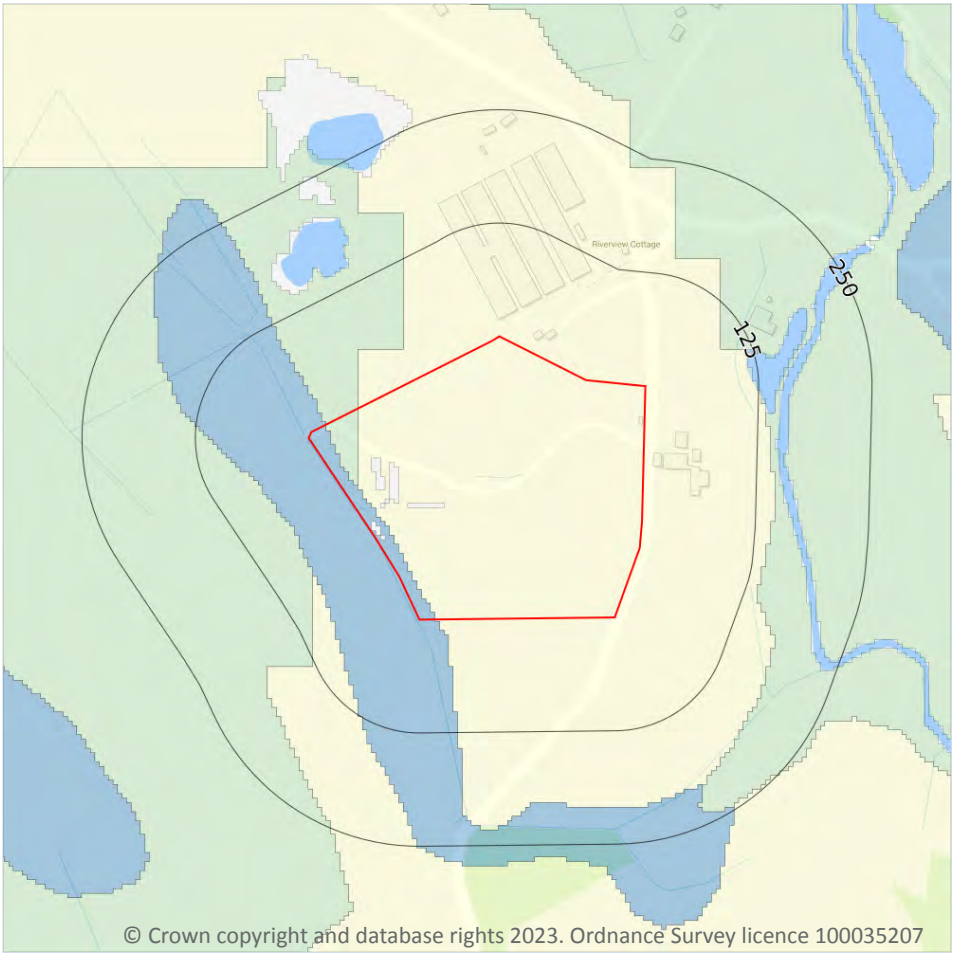
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Greater than 1.0m |
| 1 in 250 year | Greater than 1.0m |
| 1 in 100 year | Between 0.3m and 1.0m |
| 1 in 30 year | Between 0.3m and 1.0m |

*This data is sourced from Ambiental Risk Analytics.*

# 11 Groundwater flooding




Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

## 11.1 Groundwater flooding

| | |
|---|---|
| **Highest risk on site** | **Moderate** |
| **Highest risk within 50m** | **Moderate** |

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 34**

*This data is sourced from Ambiental Risk Analytics.*

# 12 Environmental designations

## 12.1 Sites of Special Scientific Interest (SSSI)

| Records within 2000m | 0 |
|---|---|

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.2 Conserved wetland sites (Ramsar sites)

| Records within 2000m | 0 |
|---|---|

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.3 Special Areas of Conservation (SAC)

| Records within 2000m | 0 |
|---|---|

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.4 Special Protection Areas (SPA)

| Records within 2000m | 0 |
|---|---|

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.5 National Nature Reserves (NNR)

| Records within 2000m | 0 |
|---|---|

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.6 Local Nature Reserves (LNR)

| Records within 2000m | 0 |
|---|---|

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.7 Designated Ancient Woodland

| Records within 2000m | 0 |
|---|---|

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.8 Biosphere Reserves

| Records within 2000m | 0 |
|---|---|

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.9 Forest Parks

| Records within 2000m | 0 |
|---|---|

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

*This data is sourced from the Forestry Commission.*

## 12.10 Marine Conservation Zones

| Records within 2000m | 0 |
|---|---|

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

# 13 Visual and cultural designations

## 13.1 World Heritage Sites

| Records within 250m | 0 |
|---|---|

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.2 Area of Outstanding Natural Beauty

| Records within 250m | 0 |
|---|---|

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 13.3 National Parks

| Records within 250m | 0 |
|---|---|

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

*This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.*

## 13.4 Listed Buildings

| Records within 250m | 0 |
|---|---|

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.5 Conservation Areas

| Records within 250m | 0 |
|---|---|

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.6 Scheduled Ancient Monuments

| Records within 250m | 0 |
|---|---|

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

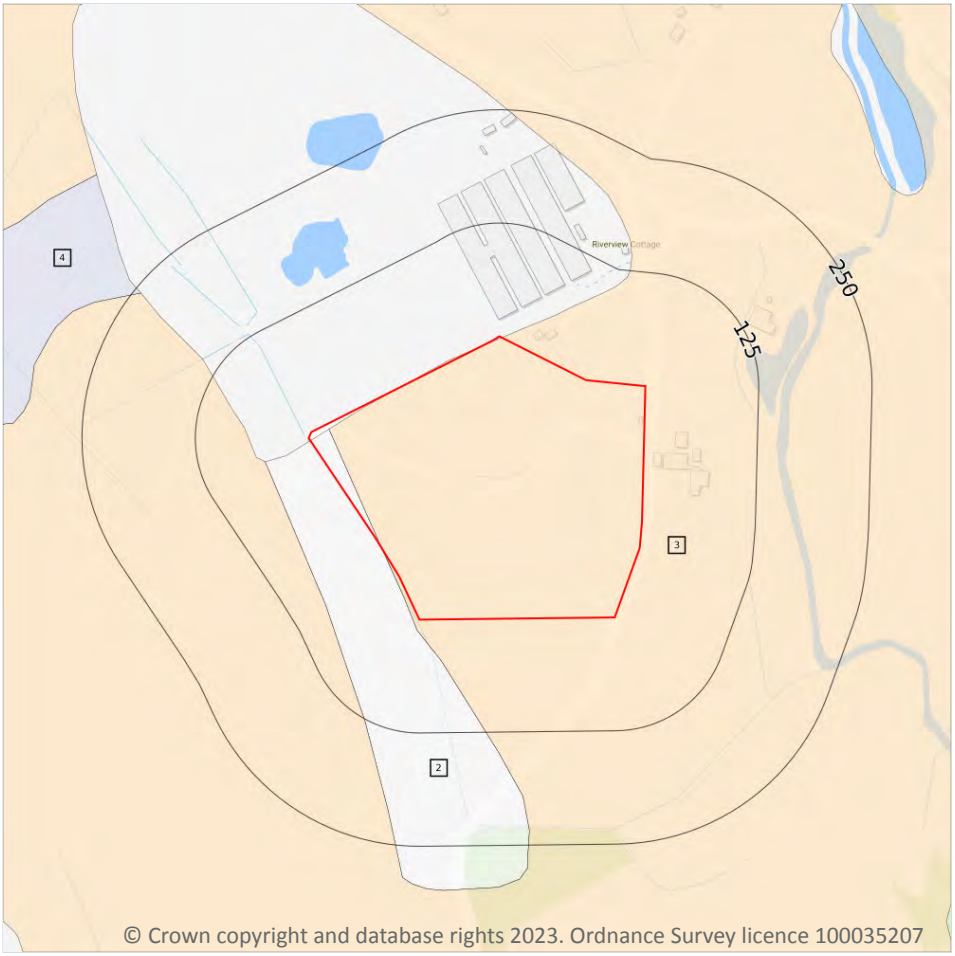
## 13.7 Registered Parks and Gardens

| Records within 250m | 0 |
|---|---|

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

# 14 Agricultural designations






Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 4 - good quality
- Grade 5 - moderate quality
- Grade 6 - poor quality
- Grade 7 - very poor quality

## 14.1 Agricultural Land Classification

| Records within 250m | 3 |
|---|---|

Classification of the quality of agricultural land taking into consideration multiple factors inclusing climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 40**

| ID | Location | Classification | Description |
|---|---|---|---|
| **2** | **On site** | **Grade 4.2** | **Land Suited to Arable Cropping** |
| **3** | **On site** | **Grade 3.2** | **Land Suited to Arable Cropping** |
| 4 | 243m NW | Grade 5.3 | Land Suited only to Improved Grassland and Rough Grazings |

*This data is sourced from the James Hutton Institute.*

## Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

## Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: https://www.groundsure.com/terms-and-conditions-april-2023/.

GREEN VOLT

# Appendix 8.3

## Gordon Sawmills Groundsure Report

Onshore EIA Report: Volume 3

Groundsure LOCATION INTELLIGENCE

Enviro Insight

# Gordon Sawmills, Longside,

## Order Details

**Date:** 14/04/2023

**Your ref:** E5475_3_PO19981

**Our Ref:** GCR-FS9-6II-8Z1-P1M

## Site Details

**Location:** 402596 848301

**Area:** 7.45 ha

**Authority:** Aberdeenshire Council





Contact us with any questions at:
info@groundsure.com
01273 257 755

# Summary of findings

| Page | Section | Past land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 11 | 1.1 | Historical industrial land uses | 4 | 0 | 2 | 7 | - |
| 12 | 1.2 | Historical tanks | 0 | 0 | 0 | 2 | - |
| 13 | 1.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 13 | 1.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 13 | 1.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| 13 | 1.6 | Historical military land | 0 | 0 | 0 | 0 | - |
| Page | Section | Past land use - un-grouped | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 14 | 2.1 | Historical industrial land uses | 6 | 0 | 2 | 9 | - |
| 15 | 2.2 | Historical tanks | 0 | 0 | 0 | 2 | - |
| 16 | 2.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 16 | 2.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 16 | 2.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| Page | Section | Waste and landfill | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 17 | 3.1 | Active or recent landfill | 0 | 0 | 0 | 0 | - |
| 17 | 3.2 | Historical landfill (BGS records) | 0 | 0 | 0 | 0 | - |
| 17 | 3.3 | Historical landfill (LA/mapping records) | 0 | 0 | 0 | 0 | - |
| 17 | 3.4 | Licensed waste sites | 0 | 0 | 0 | 0 | - |
| 17 | 3.5 | Historical waste sites | 0 | 0 | 0 | 0 | - |
| Page | Section | Current industrial land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 18 | 4.1 | Recent industrial land uses | 2 | 0 | 1 | - | - |
| 19 | 4.2 | Current or recent petrol stations | 0 | 0 | 0 | 0 | - |
| 19 | 4.3 | Electricity cables | 0 | 0 | 0 | 0 | - |
| 19 | 4.4 | Gas pipelines | 0 | 0 | 0 | 0 | - |
| 19 | 4.5 | Sites determined as Contaminated Land | 0 | 0 | 0 | 0 | - |
| 19 | 4.6 | Control of Major Accident Hazards (COMAH) | 0 | 0 | 0 | 0 | - |
| 20 | 4.7 | Regulated explosive sites | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 20 | 4.8 | Hazardous substance storage/usage | 0 | 0 | 0 | 0 | - |
| 20 | 4.9 | Part A(1), IPPC and Historic IPC Authorisations | 0 | 0 | 0 | 0 | - |
| 20 | 4.10 | Part B Authorisations | 0 | 0 | 0 | 0 | - |
| 20 | 4.11 | Pollution inventory substances | 0 | 0 | 0 | 0 | - |
| 21 | 4.12 | Pollution inventory waste transfers | 0 | 0 | 0 | 0 | - |
| 21 | 4.13 | Pollution inventory radioactive waste | 0 | 0 | 0 | 0 | - |
| Page | Section | Geology (basic) | | | | | |
| **22** | **5.1** | **Superficial geology (625k)** | Identified (within 500m) | | | | |
| **22** | **5.2** | **Bedrock geology (625k)** | Identified (within 500m) | | | | |
| Page | Section | Hydrogeology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **23** | **6.1** | **Superficial aquifer** | Identified (within 500m) | | | | |
| **24** | **6.2** | **Bedrock aquifer** | Identified (within 500m) | | | | |
| Page | Section | Hydrology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **26** | **7.1** | **Water Network (OS MasterMap)** | 0 | 5 | 4 | - | - |
| **27** | **7.2** | **Surface water features** | 0 | 3 | 7 | - | - |
| Page | Section | River flooding | | | | | |
| 28 | 8.1 | River flooding | Negligible (within 50m) | | | | |
| Page | Section | Coastal flooding | | | | | |
| 29 | 9.1 | Coastal flooding | Negligible (within 50m) | | | | |
| Page | Section | Surface water flooding | | | | | |
| **30** | **10.1** | **Surface water flooding** | 1 in 30 year, 0.3m - 1.0m (within 50m) | | | | |
| Page | Section | Groundwater flooding | | | | | |
| **32** | **11.1** | **Groundwater flooding** | Low (within 50m) | | | | |
| Page | Section | Environmental designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 33 | 12.1 | Sites of Special Scientific Interest (SSSI) | 0 | 0 | 0 | 0 | 0 |
| 33 | 12.2 | Conserved wetland sites (Ramsar sites) | 0 | 0 | 0 | 0 | 0 |
| 33 | 12.3 | Special Areas of Conservation (SAC) | 0 | 0 | 0 | 0 | 0 |
| 33 | 12.4 | Special Protection Areas (SPA) | 0 | 0 | 0 | 0 | 0 |
| 34 | 12.5 | National Nature Reserves (NNR) | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 34 | 12.6 | Local Nature Reserves (LNR) | 0 | 0 | 0 | 0 | 0 |
| 34 | 12.7 | Designated Ancient Woodland | 0 | 0 | 0 | 0 | 0 |
| 34 | 12.8 | Biosphere Reserves | 0 | 0 | 0 | 0 | 0 |
| 35 | 12.9 | Forest Parks | 0 | 0 | 0 | 0 | 0 |
| 35 | 12.10 | Marine Conservation Zones | 0 | 0 | 0 | 0 | 0 |
| Page | Section | Visual and cultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 36 | 13.1 | World Heritage Sites | 0 | 0 | 0 | - | - |
| 36 | 13.2 | Area of Outstanding Natural Beauty | 0 | 0 | 0 | - | - |
| 36 | 13.3 | National Parks | 0 | 0 | 0 | - | - |
| 36 | 13.4 | Listed Buildings | 0 | 0 | 0 | - | - |
| 37 | 13.5 | Conservation Areas | 0 | 0 | 0 | - | - |
| 37 | 13.6 | Scheduled Ancient Monuments | 0 | 0 | 0 | - | - |
| 37 | 13.7 | Registered Parks and Gardens | 0 | 0 | 0 | - | - |
| Page | Section | Agricultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **38** | **14.1** | **Agricultural Land Classification** | Grade 4.2 (within 250m) | | | | |

## Recent aerial photograph


Capture Date: 29/05/2018

Site Area: 7.45ha

# Recent site history - 2014 aerial photograph


Capture Date: 20/04/2014

Site Area: 7.45ha

# Recent site history - 2005 aerial photograph


Capture Date: 03/09/2005

Site Area: 7.45ha

# Recent site history - 2003 aerial photograph


Capture Date: 13/07/2003

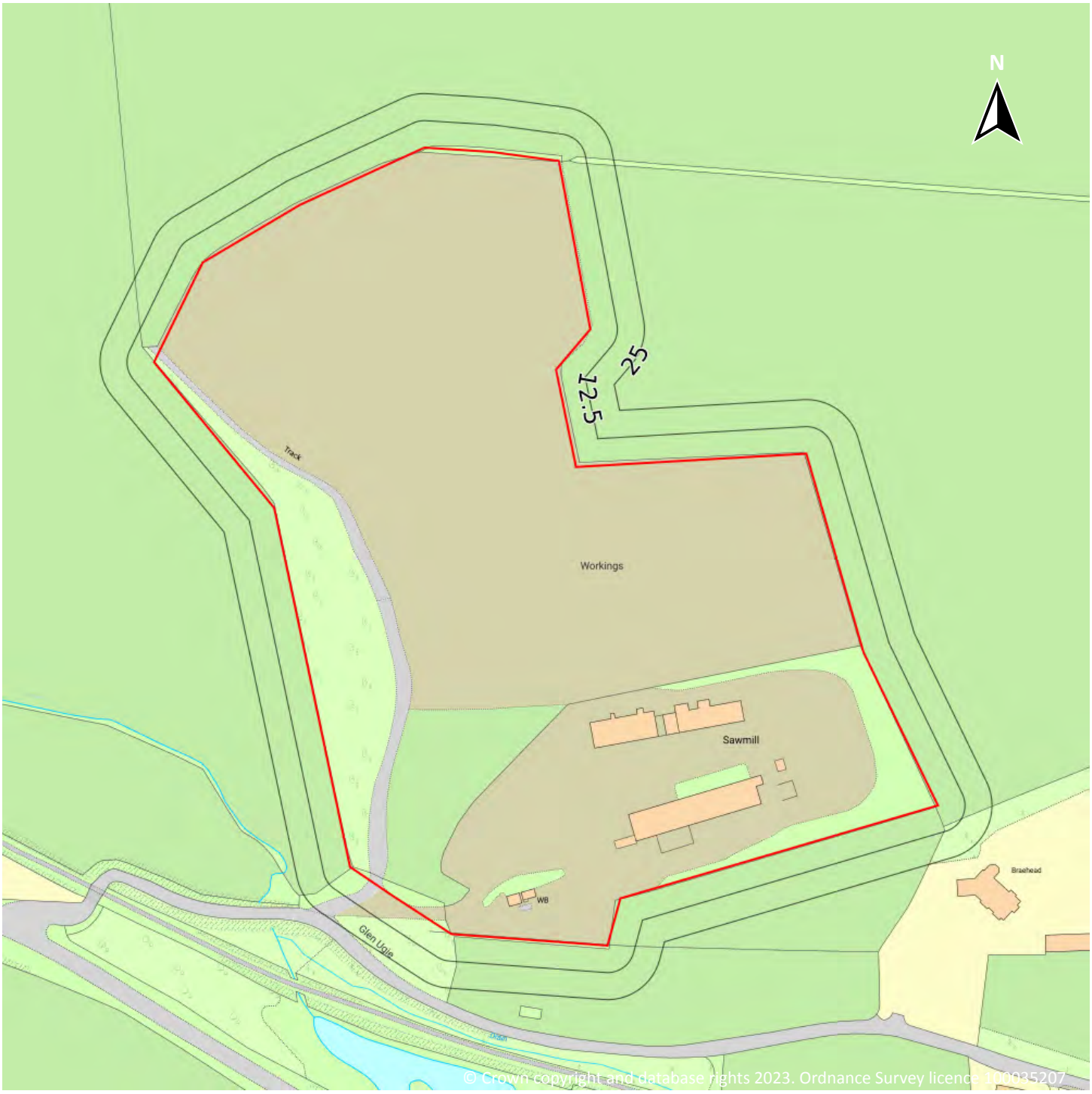
Site Area: 7.45ha

# Recent site history - 2001 aerial photograph


Capture Date: 01/01/2001

Site Area: 7.45ha

## OS MasterMap site plan




Site Area: 7.45ha

# 1 Past land use


Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

## 1.1 Historical industrial land uses

| Records within 500m | 13 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 11**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| **1** | **On site** | **Unspecified Quarry** | **1902** | **1294482** |

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| **2** | **On site** | **Unspecified Quarry** | **1902 - 1955** | **1294709** |
| **A** | **On site** | **Sawmill** | **1973** | **1294349** |
| **A** | **On site** | **Unspecified Quarry** | **1902 - 1955** | **1294905** |
| B | 65m S | Sawmill | 1902 | 1294348 |
| B | 74m S | Unspecified Mill | 1955 | 1294120 |
| C | 285m SE | Cuttings | 1955 - 1973 | 1295165 |
| C | 322m SE | Cuttings | 1902 | 1294714 |
| C | 336m SE | Cuttings | 1955 | 1294716 |
| 3 | 376m W | Unspecified Quarry | 1902 - 1955 | 1294758 |
| 5 | 450m N | Unspecified Heap | 1973 | 1294625 |
| 6 | 450m N | Rifle Range | 1902 | 1295188 |
| 7 | 452m N | Rifle Range | 1955 | 1294822 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.2 Historical tanks

| **Records within 500m** | **2** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 11**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| 4 | 390m SW | Unspecified Tank | 1870 | 197418 |
| 8 | 496m SW | Tank or Trough | 1870 | 197644 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.3 Historical energy features

| Records within 500m | 0 |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.5 Historical garages

| Records within 500m | 0 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.6 Historical military land

| Records within 500m | 0 |
|---|---|

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

*This data is sourced from Ordnance Survey / Groundsure / other sources.*

# 2 Past land use - un-grouped


Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

## 2.1 Historical industrial land uses

| Records within 500m | 17 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 14**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| **1** | **On site** | **Unspecified Quarry** | **1902** | **1294482** |
| **A** | **On site** | **Sawmill** | **1973** | **1294349** |
| **A** | **On site** | **Unspecified Quarry** | **1955** | **1294905** |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| **A** | **On site** | **Unspecified Quarry** | **1902** | **1294905** |
| **B** | **On site** | **Unspecified Quarry** | **1955** | **1294709** |
| **B** | **On site** | **Unspecified Quarry** | **1902** | **1294709** |
| C | 65m S | Sawmill | 1902 | 1294348 |
| C | 74m S | Unspecified Mill | 1955 | 1294120 |
| 2 | 285m SE | Cuttings | 1955 | 1295165 |
| D | 298m SE | Cuttings | 1973 | 1295165 |
| D | 322m SE | Cuttings | 1902 | 1294714 |
| D | 336m SE | Cuttings | 1955 | 1294716 |
| E | 376m W | Unspecified Quarry | 1902 | 1294758 |
| E | 383m W | Unspecified Quarry | 1955 | 1294758 |
| 4 | 450m N | Unspecified Heap | 1973 | 1294625 |
| 5 | 450m N | Rifle Range | 1902 | 1295188 |
| 6 | 452m N | Rifle Range | 1955 | 1294822 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.2 Historical tanks

| **Records within 500m** | **2** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 14**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| 3 | 390m SW | Unspecified Tank | 1870 | 197418 |
| 7 | 496m SW | Tank or Trough | 1870 | 197644 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.3 Historical energy features

| Records within 500m | 0 |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.5 Historical garages

| Records within 500m | 0 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

# 3 Waste and landfill

## 3.1 Active or recent landfill

| Records within 500m | 0 |
|---|---|

Active or recently closed landfill sites under Scottish Environment Protection (SEPA) regulation.

*This data is sourced from the Scottish Environment Protection Agency.*

## 3.2 Historical landfill (BGS records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

*This data is sourced from the British Geological Survey.*

## 3.3 Historical landfill (LA/mapping records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified from Local Authority records and high detail historical mapping.

*This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.*

## 3.4 Licensed waste sites

| Records within 500m | 0 |
|---|---|

Active or recently closed waste sites under Scottish Environment Protection Acency (SEPA) regulation.

*This data is sourced from the Scottish Environment Protection Agency.*

## 3.5 Historical waste sites

| Records within 500m | 0 |
|---|---|

Waste site records derived from Local Authority planning records and high detail historical mapping.

*This data is sourced from Ordnance Survey/Groundsure and Local Authority records.*

# 4 Current industrial land use




Site Outline

Search buffers in metres (m)

Recent industrial land uses

## 4.1 Recent industrial land uses

| Records within 250m | 3 |
|---|---|

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 18**

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| **1** | **On site** | **Gordon Sawmills Ltd** | **Glenugie Sawmill, Longside, Aberdeenshire, AB42 4XE** | **Wood Products Including Charcoal, Paper, Card and Board** | **Industrial Products** |
| **2** | **On site** | **Workings** | **Aberdeenshire, AB42** | **Unspecified Quarries Or Mines** | **Extractive Industries** |

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| 3 | 225m SE | Pump | Aberdeenshire, AB42 | Water Pumping Stations | Industrial Features |

*This data is sourced from Ordnance Survey.*

## 4.2 Current or recent petrol stations

| Records within 500m | 0 |
|---|---|

Open, closed, under development and obsolete petrol stations.

*This data is sourced from Experian.*

## 4.3 Electricity cables

| Records within 500m | 0 |
|---|---|

High voltage underground electricity transmission cables.

*This data is sourced from National Grid.*

## 4.4 Gas pipelines

| Records within 500m | 0 |
|---|---|

High pressure underground gas transmission pipelines.

*This data is sourced from National Grid.*

## 4.5 Sites determined as Contaminated Land

| Records within 500m | 0 |
|---|---|

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

*This data is sourced from Local Authority records.*

## 4.6 Control of Major Accident Hazards (COMAH)

| Records within 500m | 0 |
|---|---|

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

*This data is sourced from the Health and Safety Executive.*

## 4.7 Regulated explosive sites

| Records within 500m | 0 |
|---|---|

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

*This data is sourced from the Health and Safety Executive.*

## 4.8 Hazardous substance storage/usage

| Records within 500m | 0 |
|---|---|

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

*This data is sourced from Local Authority records.*

## 4.9 Part A(1), IPPC and Historic IPC Authorisations

| Records within 500m | 0 |
|---|---|

Records of Part A installations regulated for the release of substances to the environment.

*This data is sourced from the Scottish Environment Protection Agency.*

## 4.10 Part B Authorisations

| Records within 500m | 0 |
|---|---|

Records of Part B installations regulated for the release of substances to the environment.

*This data is sourced from the Scottish Environment Protection Agency.*

## 4.11 Pollution inventory substances

| Records within 500m | 0 |
|---|---|

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.12 Pollution inventory waste transfers

| Records within 500m | 0 |
|---|---|

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.13 Pollution inventory radioactive waste

| Records within 500m | 0 |
|---|---|

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

# 5 Geology (basic)

## 5.1 Superficial geology (625k)

| Records within 500m | 3 |
|---|---|

Generalised geology data based on BGS's published poster maps of the UK (North and South). Superficial related themes digitised from 1977 first edition Quaternary map (North and South).

| Location | Lex code | Description | Rock type |
|---|---|---|---|
| **On site** | **TILL-DMTN** | **TILL** | **DIAMICTON** |
| 124m SE | GSG-SAGR | GLACIAL SAND AND GRAVEL | SAND AND GRAVEL |
| 311m S | ALV-CLSS | ALLUVIUM | CLAY, SILT AND SAND |

*This data is sourced from the British Geological Survey.*

## 5.2 Bedrock geology (625k)

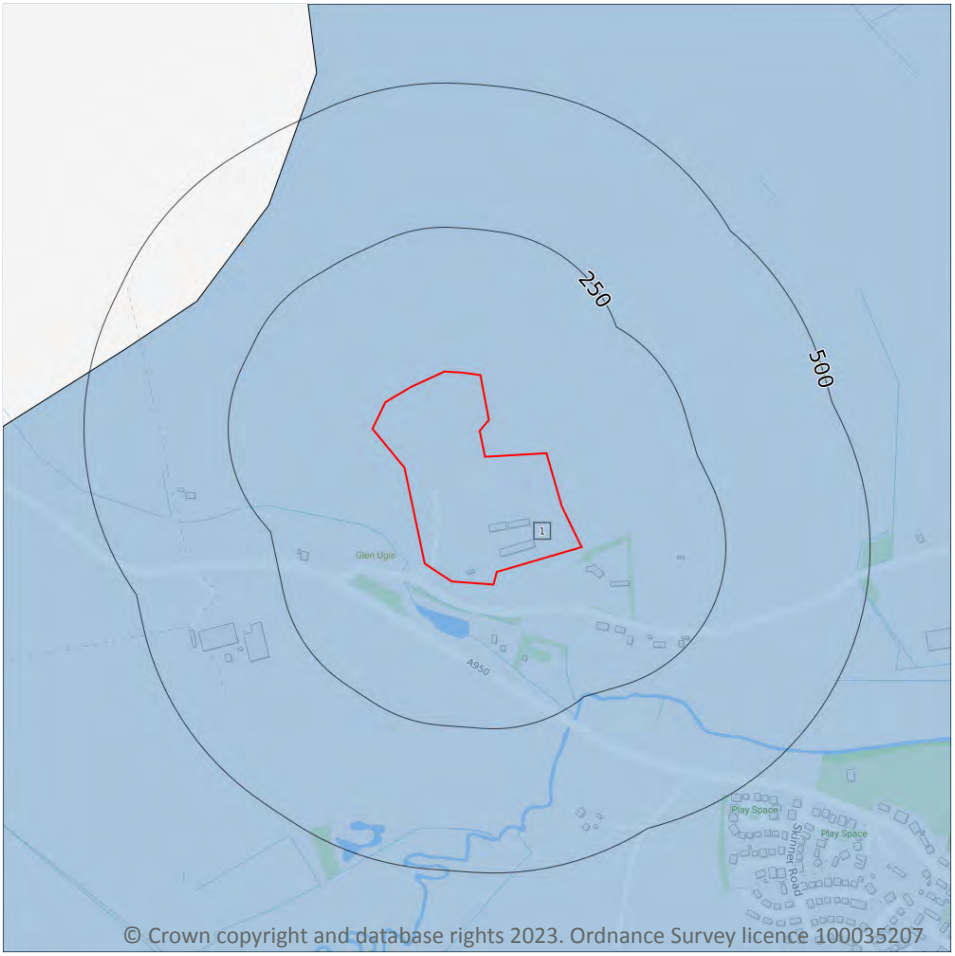
| Records within 500m | 2 |
|---|---|

Generalised geology data based on BGS's published poster maps of the UK (North and South). Bedrock related themes created through generalisation of 1:50,000 data.

| Location | Lex code | Description | Rock type |
|---|---|---|---|
| **On site** | **UIIOS-FELSR** | **UNNAMED IGNEOUS INTRUSION, ORDOVICIAN TO SILURIAN** | **FELSIC-ROCK** |
| **On site** | **ARGY-PSP** | **ARGYLL GROUP** | **PSAMMITE, SEMIPELITE AND PELITE** |

*This data is sourced from the British Geological Survey.*

# 6 Hydrogeology - Superficial aquifer




Site Outline

Search buffers in metres (m)

Limited or local potential

Locally important - intergranular

## 6.1 Superficial aquifer

| Records within 500m | 1 |
|---|---|

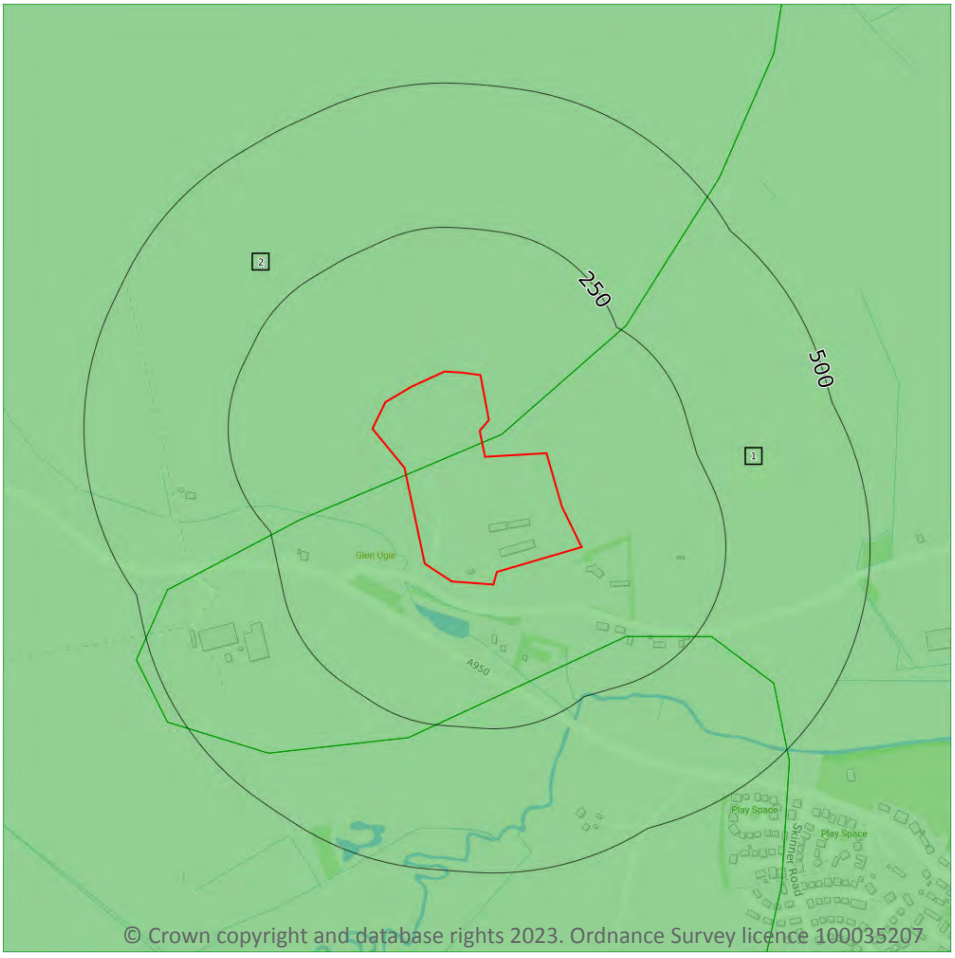
Records of groundwater classification within superficial geology.

Features are displayed on the Hydrogeology map on **page 23**

| ID | Location | Description | Type | Rock description |
|---|---|---|---|---|
| **1** | **On site** | **Concealed aquifers, aquifers of limited potential, regions without significant groundwater** | **Concealed aquifers; aquifers with limited or local potential** | **Quaternary Coastal and Fluviatile Alluvium** |

*This data is sourced from the British Geological Survey.*

# Bedrock aquifer




Site Outline

Search buffers in metres (m)

- Highly productive - fissures/discontinuities
- Highly productive - intergranular
- Moderately productive - fissures/discontinuities
- Moderately productive - intergranular
- Low productive - fissures/discontinuities
- Low productive - intergranular
- No significant groundwater

## 6.2 Bedrock aquifer

**Records within 500m** **2**

Records of groundwater classification within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 24**

| ID | Location | Description | Flow | Summary | Rock description |
|---|---|---|---|---|---|
| **1** | **On site** | **Low productivity aquifer** | **Flow is virtually all through fractures and other discontinuities** | **Small amounts of groundwater in near surface weathered zone and secondary fractures; rare springs.** | **UNNAMED IGNEOUS INTRUSION, ORDOVICIAN TO SILURIAN** |

| ID | Location | Description | Flow | Summary | Rock description |
|---|---|---|---|---|---|
| **2** | **On site** | **Low productivity aquifer** | **Flow is virtually all through fractures and other discontinuities** | **Small amounts of groundwater in near surface weathered zone and fractures.** | **ARGYLL GROUP** |

*This data is sourced from the British Geological Survey.*

# 7 Hydrology


Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

## 7.1 Water Network (OS MasterMap)

| **Records within 250m** | **9** |
|---|---|

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 26**

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| A | 28m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| B | 41m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| C | 44m SW | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | - |
| C | 45m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| C | 46m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 63m S | Lake, loch or reservoir. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| D | 90m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| F | 157m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| 1 | 245m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | South Ugie Water |

*This data is sourced from the Ordnance Survey.*

## 7.2 Surface water features

| **Records within 250m** | **10** |
|---|---|

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 26**

*This data is sourced from the Ordnance Survey.*

# 8 River flooding

## 8.1 River flooding

| | |
|---|---|
| **Highest risk on site** | **Negligible** |
| **Highest risk within 50m** | **Negligible** |

This is an assessment of flood risk for rivers in Scotland produced using modelled data, provided by Ambiental Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of flooding from rivers presented in the following categories:

- 1 in 30 year (3.33%)
- 1 in 100 year (1%)
- 1 in 250 year (0.4%)
- and 1 in 1,000 year (0.1%)

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Negligible |
| 1 in 250 year | Negligible |
| 1 in 100 year | Negligible |
| 1 in 30 year | Negligible |

*This data is sourced from Ambiental Risk Analytics.*

# 9 Coastal flooding - Coastal flooding

## 9.1 Coastal flooding

| | |
|---|---|
| **Highest risk on site** | **Negligible** |
| **Highest risk within 50m** | **Negligible** |

This is an assessment of coastal flood risk in Scotland produced using modelled data, provided by Ambiental Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of coastal flooding presented in the following categories:

- 1 in 30 year (3.33%)
- 1 in 100 year (1%)
- 1 in 250 year (0.4%)
- and 1 in 1,000 year (0.1%)

The data shown on the map shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Negligible |
| 1 in 250 year | Negligible |
| 1 in 100 year | Negligible |
| 1 in 30 year | Negligible |

*This data is sourced from Ambiental Risk Analytics.*

# 10 Surface water flooding




Site Outline

Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

## 10.1 Surface water flooding

| | |
|---|---|
| **Highest risk on site** | **1 in 30 year, 0.3m - 1.0m** |
| **Highest risk within 50m** | **1 in 30 year, 0.3m - 1.0m** |

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 30**

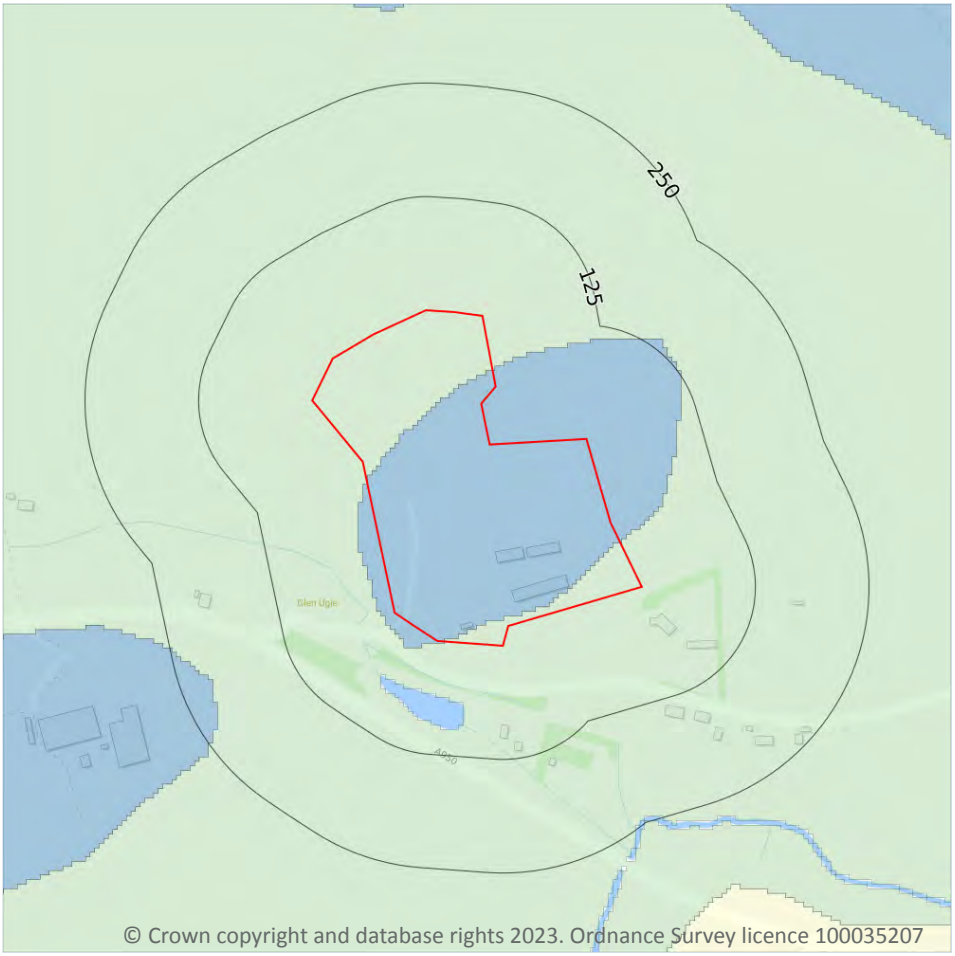
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

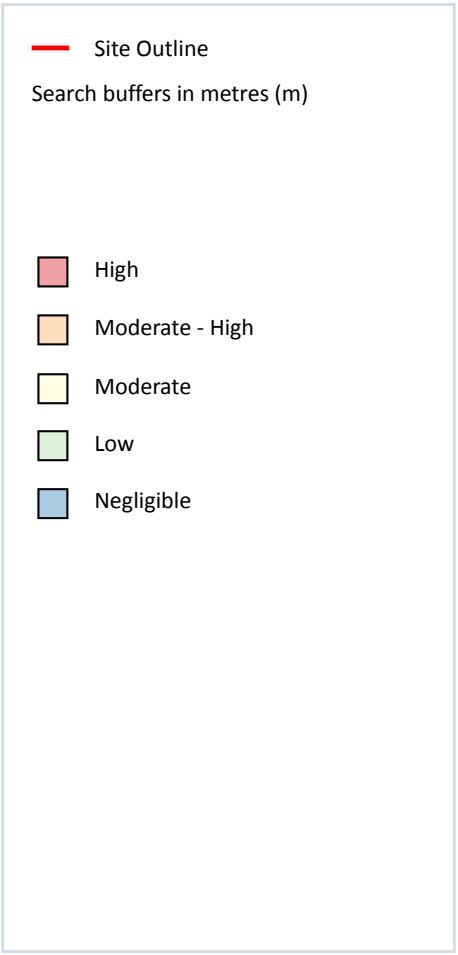
The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Between 0.3m and 1.0m |
| 1 in 250 year | Between 0.3m and 1.0m |
| 1 in 100 year | Between 0.3m and 1.0m |
| 1 in 30 year | Between 0.3m and 1.0m |

*This data is sourced from Ambiental Risk Analytics.*

# 11 Groundwater flooding




## 11.1 Groundwater flooding

| | |
|---|---|
| **Highest risk on site** | **Low** |
| **Highest risk within 50m** | **Low** |

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 32**

*This data is sourced from Ambiental Risk Analytics.*

# 12 Environmental designations

## 12.1 Sites of Special Scientific Interest (SSSI)

| Records within 2000m | 0 |
|---|---|

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.2 Conserved wetland sites (Ramsar sites)

| Records within 2000m | 0 |
|---|---|

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.3 Special Areas of Conservation (SAC)

| Records within 2000m | 0 |
|---|---|

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.4 Special Protection Areas (SPA)

| Records within 2000m | 0 |
|---|---|

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.5 National Nature Reserves (NNR)

| Records within 2000m | 0 |
|---|---|

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.6 Local Nature Reserves (LNR)

| Records within 2000m | 0 |
|---|---|

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.7 Designated Ancient Woodland

| Records within 2000m | 0 |
|---|---|

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.8 Biosphere Reserves

| Records within 2000m | 0 |
|---|---|

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.9 Forest Parks

| Records within 2000m | 0 |
|---|---|

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

*This data is sourced from the Forestry Commission.*

## 12.10 Marine Conservation Zones

| Records within 2000m | 0 |
|---|---|

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

# 13 Visual and cultural designations

## 13.1 World Heritage Sites

| Records within 250m | 0 |
|---|---|

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.2 Area of Outstanding Natural Beauty

| Records within 250m | 0 |
|---|---|

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 13.3 National Parks

| Records within 250m | 0 |
|---|---|

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

*This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.*

## 13.4 Listed Buildings

| Records within 250m | 0 |
|---|---|

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.5 Conservation Areas

| Records within 250m | 0 |
|---|---|

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.6 Scheduled Ancient Monuments

| Records within 250m | 0 |
|---|---|

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

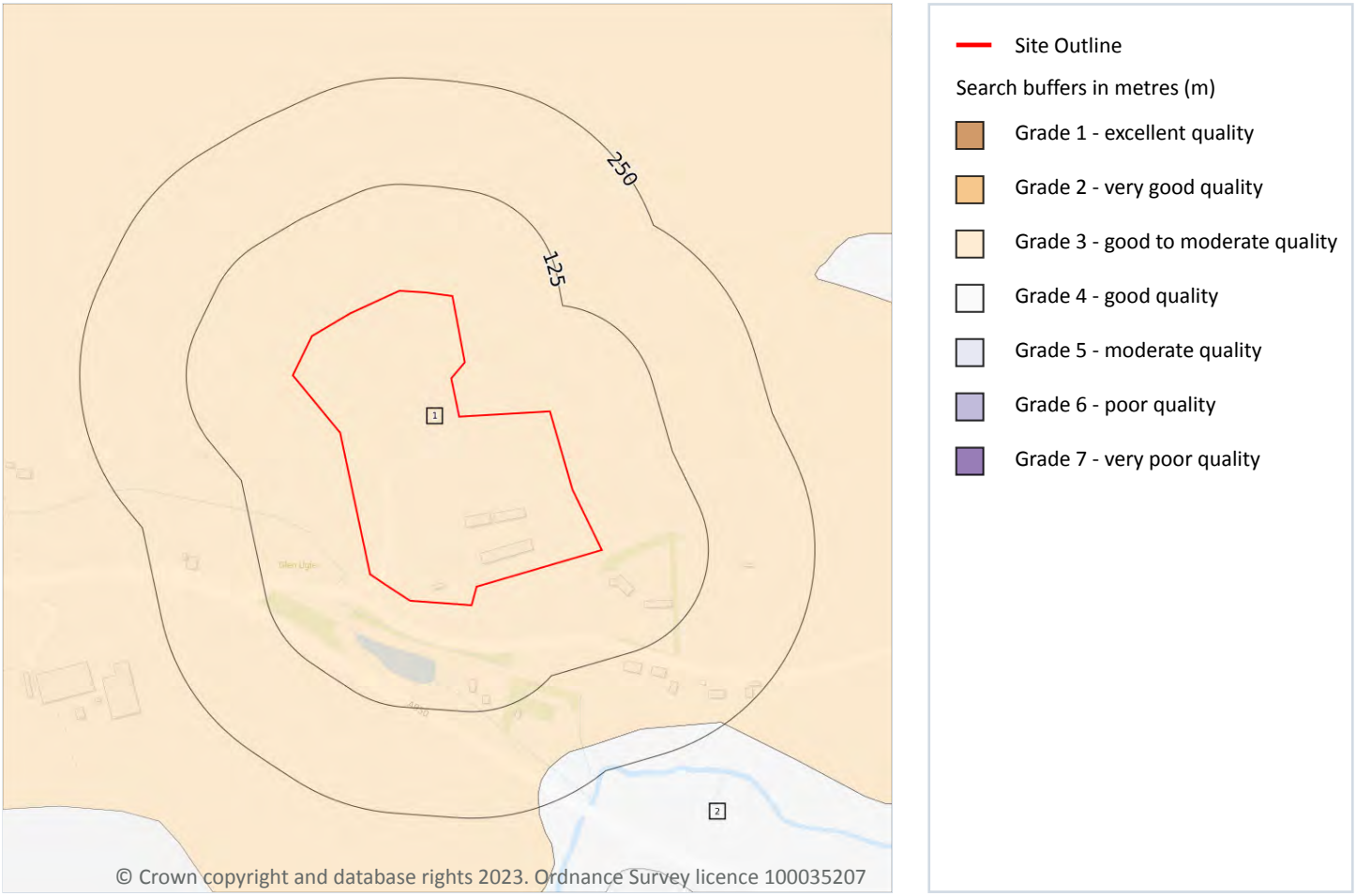
## 13.7 Registered Parks and Gardens

| Records within 250m | 0 |
|---|---|

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

# 14 Agricultural designations






## 14.1 Agricultural Land Classification

| **Records within 250m** | **2** |
|---|---|

Classification of the quality of agricultural land taking into consideration multiple factors inclusing climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 38**

| ID | Location | Classification | Description |
|---|---|---|---|
| **1** | **On site** | **Grade 3.2** | **Land Suited to Arable Cropping** |
| 2 | 207m SE | Grade 4.2 | Land Suited to Arable Cropping |

*This data is sourced from the James Hutton Institute.*

## Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

## Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: https://www.groundsure.com/terms-and-conditions-april-2023/.

GREEN VOLT

# Appendix 8.4

## Gilkhorn Groundsure Report

Onshore EIA Report: Volume 3

Groundsure LOCATION INTELLIGENCE

Enviro Insight

# Gilkhorn,

## Order Details

**Date:** 14/04/2023

**Your ref:** E5475_2_PO19981

**Our Ref:** GCR-4GR-F62-T4I-A8Q

## Site Details

**Location:** 391604 845636

**Area:** 7.31 ha

**Authority:** Aberdeenshire Council






Contact us with any questions at:
info@groundsure.com
01273 257 755

# Summary of findings

| Page | Section | Past land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **11** | **1.1** | **Historical industrial land uses** | 2 | 1 | 1 | 2 | - |
| **12** | **1.2** | **Historical tanks** | 0 | 0 | 1 | 0 | - |
| 12 | 1.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 13 | 1.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 13 | 1.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| 13 | 1.6 | Historical military land | 0 | 0 | 0 | 0 | - |
| Page | Section | Past land use - un-grouped | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **14** | **2.1** | **Historical industrial land uses** | 2 | 1 | 1 | 2 | - |
| **15** | **2.2** | **Historical tanks** | 0 | 0 | 1 | 0 | - |
| 15 | 2.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 15 | 2.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 16 | 2.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| Page | Section | Waste and landfill | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 17 | 3.1 | Active or recent landfill | 0 | 0 | 0 | 0 | - |
| 17 | 3.2 | Historical landfill (BGS records) | 0 | 0 | 0 | 0 | - |
| **18** | **3.3** | **Historical landfill (LA/mapping records)** | 1 | 0 | 0 | 0 | - |
| 18 | 3.4 | Licensed waste sites | 0 | 0 | 0 | 0 | - |
| 18 | 3.5 | Historical waste sites | 0 | 0 | 0 | 0 | - |
| Page | Section | Current industrial land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 19 | 4.1 | Recent industrial land uses | 0 | 0 | 0 | - | - |
| 19 | 4.2 | Current or recent petrol stations | 0 | 0 | 0 | 0 | - |
| 20 | 4.3 | Electricity cables | 0 | 0 | 0 | 0 | - |
| **20** | **4.4** | **Gas pipelines** | 0 | 0 | 0 | 1 | - |
| 20 | 4.5 | Sites determined as Contaminated Land | 0 | 0 | 0 | 0 | - |
| 20 | 4.6 | Control of Major Accident Hazards (COMAH) | 0 | 0 | 0 | 0 | - |
| 21 | 4.7 | Regulated explosive sites | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 21 | 4.8 | Hazardous substance storage/usage | 0 | 0 | 0 | 0 | - |
| 21 | 4.9 | Part A(1), IPPC and Historic IPC Authorisations | 0 | 0 | 0 | 0 | - |
| 21 | 4.10 | Part B Authorisations | 0 | 0 | 0 | 0 | - |
| 21 | 4.11 | Pollution inventory substances | 0 | 0 | 0 | 0 | - |
| 22 | 4.12 | Pollution inventory waste transfers | 0 | 0 | 0 | 0 | - |
| 22 | 4.13 | Pollution inventory radioactive waste | 0 | 0 | 0 | 0 | - |
| Page | Section | Geology (basic) | | | | | |
| **23** | **5.1** | **Superficial geology (625k)** | Identified (within 500m) | | | | |
| **23** | **5.2** | **Bedrock geology (625k)** | Identified (within 500m) | | | | |
| Page | Section | Hydrogeology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 24 | 6.1 | Superficial aquifer | None (within 500m) | | | | |
| **25** | **6.2** | **Bedrock aquifer** | Identified (within 500m) | | | | |
| Page | Section | Hydrology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **27** | **7.1** | **Water Network (OS MasterMap)** | 9 | 0 | 6 | - | - |
| **29** | **7.2** | **Surface water features** | 1 | 0 | 4 | - | - |
| Page | Section | River flooding | | | | | |
| 30 | 8.1 | River flooding | Negligible (within 50m) | | | | |
| Page | Section | Coastal flooding | | | | | |
| 31 | 9.1 | Coastal flooding | Negligible (within 50m) | | | | |
| Page | Section | Surface water flooding | | | | | |
| **32** | **10.1** | **Surface water flooding** | 1 in 30 year, 0.3m - 1.0m (within 50m) | | | | |
| Page | Section | Groundwater flooding | | | | | |
| **34** | **11.1** | **Groundwater flooding** | Low (within 50m) | | | | |
| Page | Section | Environmental designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 35 | 12.1 | Sites of Special Scientific Interest (SSSI) | 0 | 0 | 0 | 0 | 0 |
| 36 | 12.2 | Conserved wetland sites (Ramsar sites) | 0 | 0 | 0 | 0 | 0 |
| 36 | 12.3 | Special Areas of Conservation (SAC) | 0 | 0 | 0 | 0 | 0 |
| 36 | 12.4 | Special Protection Areas (SPA) | 0 | 0 | 0 | 0 | 0 |
| 36 | 12.5 | National Nature Reserves (NNR) | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 37 | 12.6 | Local Nature Reserves (LNR) | 0 | 0 | 0 | 0 | 0 |
| **37** | **12.7** | **Designated Ancient Woodland** | 0 | 0 | 0 | 0 | 3 |
| 37 | 12.8 | Biosphere Reserves | 0 | 0 | 0 | 0 | 0 |
| 38 | 12.9 | Forest Parks | 0 | 0 | 0 | 0 | 0 |
| 38 | 12.10 | Marine Conservation Zones | 0 | 0 | 0 | 0 | 0 |
| Page | Section | Visual and cultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 39 | 13.1 | World Heritage Sites | 0 | 0 | 0 | - | - |
| 39 | 13.2 | Area of Outstanding Natural Beauty | 0 | 0 | 0 | - | - |
| 39 | 13.3 | National Parks | 0 | 0 | 0 | - | - |
| 39 | 13.4 | Listed Buildings | 0 | 0 | 0 | - | - |
| 40 | 13.5 | Conservation Areas | 0 | 0 | 0 | - | - |
| 40 | 13.6 | Scheduled Ancient Monuments | 0 | 0 | 0 | - | - |
| 40 | 13.7 | Registered Parks and Gardens | 0 | 0 | 0 | - | - |
| Page | Section | Agricultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **41** | **14.1** | **Agricultural Land Classification** | Grade 6.1 (within 250m) | | | | |

## Recent aerial photograph


Capture Date: 29/05/2018

Site Area: 7.31ha

# Recent site history - 2015 aerial photograph


Capture Date: 15/05/2015

Site Area: 7.31ha

# Recent site history - 2011 aerial photograph


Capture Date: 07/05/2011

Site Area: 7.31ha

# Recent site history - 2003 aerial photograph


Capture Date: 13/07/2003

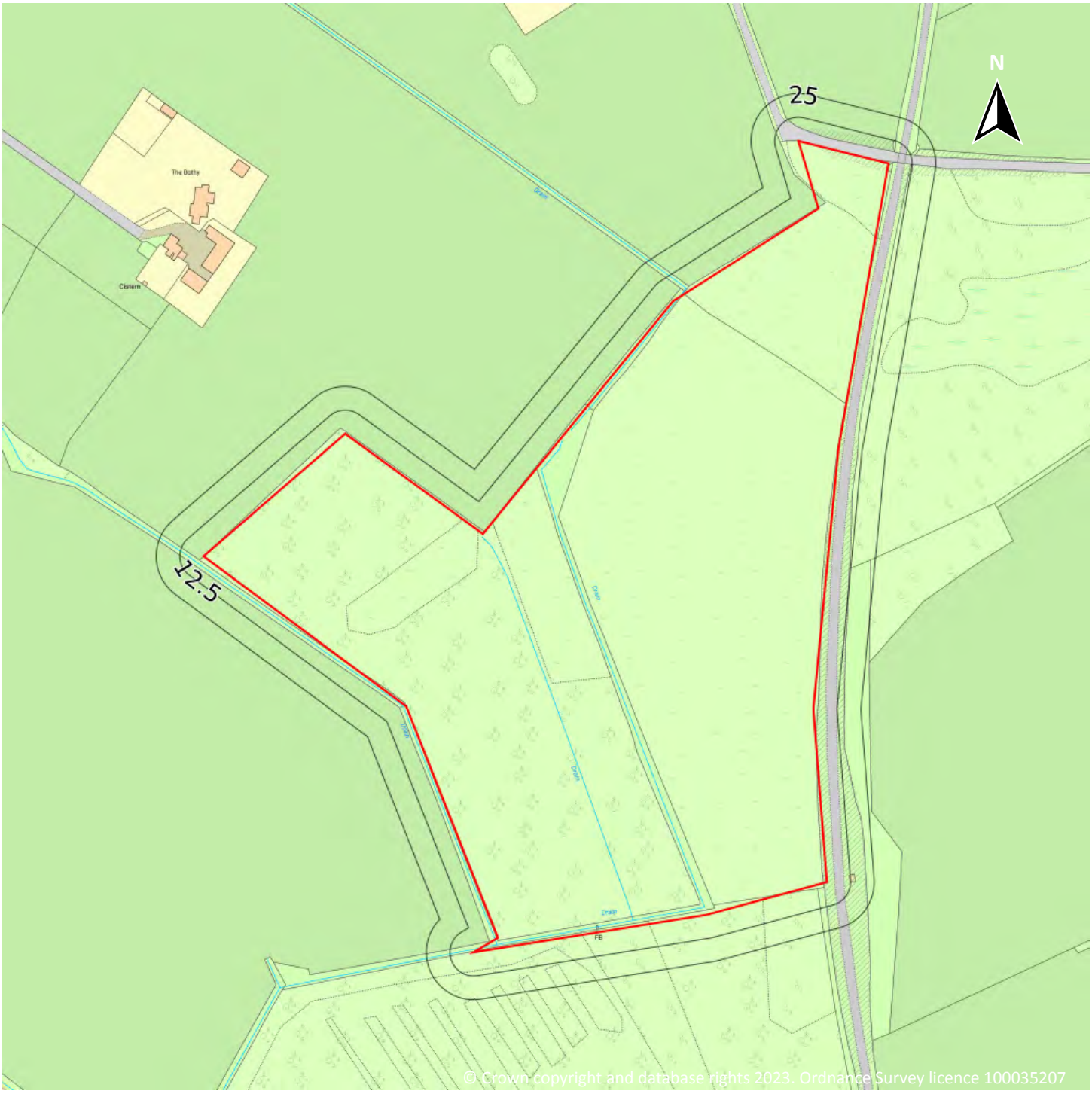
Site Area: 7.31ha

# Recent site history - 2001 aerial photograph


Capture Date: 12/05/2001

Site Area: 7.31ha

## OS MasterMap site plan






Site Area: 7.31ha

# 1 Past land use


Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

## 1.1 Historical industrial land uses

| Records within 500m | 6 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 11**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| **1** | **On site** | **Refuse Heap** | **1970** | **439564** |

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| **2** | **On site** | **Cuttings** | **1955** | **450081** |
| 3 | 1m SE | Cuttings | 1870 | 455605 |
| 5 | 151m S | Unspecified Mill | 1870 | 439102 |
| 6 | 280m SW | Unspecified Mill | 1870 | 439103 |
| 7 | 483m N | Unspecified Mill | 1870 | 439098 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.2 Historical tanks

| **Records within 500m** | **1** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 11**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| 4 | 119m NW | Tank or Trough | 1871 | 57714 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.3 Historical energy features

| **Records within 500m** | **0** |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.5 Historical garages

| Records within 500m | 0 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.6 Historical military land

| Records within 500m | 0 |
|---|---|

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

*This data is sourced from Ordnance Survey / Groundsure / other sources.*

# 2 Past land use - un-grouped


Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

## 2.1 Historical industrial land uses

| Records within 500m | 6 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 14**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| **1** | **On site** | **Refuse Heap** | **1970** | **439564** |
| **2** | **On site** | **Cuttings** | **1955** | **450081** |
| 3 | 1m SE | Cuttings | 1870 | 455605 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| 5 | 151m S | Unspecified Mill | 1870 | 439102 |
| 6 | 280m SW | Unspecified Mill | 1870 | 439103 |
| 7 | 483m N | Unspecified Mill | 1870 | 439098 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.2 Historical tanks

| **Records within 500m** | **1** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 14**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| 4 | 119m NW | Tank or Trough | 1871 | 57714 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.3 Historical energy features

| **Records within 500m** | **0** |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.4 Historical petrol stations

| **Records within 500m** | **0** |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.5 Historical garages

| Records within 500m | 0 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

# 3 Waste and landfill


Site Outline

Search buffers in metres (m)

Historical landfill (LA/OS)

## 3.1 Active or recent landfill

| Records within 500m | 0 |
|---|---|

Active or recently closed landfill sites under Scottish Environment Protection (SEPA) regulation.

*This data is sourced from the Scottish Environment Protection Agency.*

## 3.2 Historical landfill (BGS records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

*This data is sourced from the British Geological Survey.*

## 3.3 Historical landfill (LA/mapping records)

| Records within 500m | 1 |
|---|---|

Landfill sites identified from Local Authority records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 17**

| ID | Location | Site address | Source | Data type |
|---|---|---|---|---|
| **1** | **On site** | **Refuse Tip** | **1969 mapping** | **Polygon** |

*This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.*

## 3.4 Licensed waste sites

| Records within 500m | 0 |
|---|---|

Active or recently closed waste sites under Scottish Environment Protection Acency (SEPA) regulation.

*This data is sourced from the Scottish Environment Protection Agency.*

## 3.5 Historical waste sites

| Records within 500m | 0 |
|---|---|

Waste site records derived from Local Authority planning records and high detail historical mapping.

*This data is sourced from Ordnance Survey/Groundsure and Local Authority records.*

# 4 Current industrial land use


Site Outline

Search buffers in metres (m)

Gas pipelines

## 4.1 Recent industrial land uses

| Records within 250m | 0 |
|---|---|

Current potentially contaminative industrial sites.

*This data is sourced from Ordnance Survey.*

## 4.2 Current or recent petrol stations

| Records within 500m | 0 |
|---|---|

Open, closed, under development and obsolete petrol stations.

*This data is sourced from Experian.*

## 4.3 Electricity cables

| Records within 500m | 0 |
|---|---|

High voltage underground electricity transmission cables.

*This data is sourced from National Grid.*

## 4.4 Gas pipelines

| Records within 500m | 1 |
|---|---|

High pressure underground gas transmission pipelines.

Features are displayed on the Current industrial land use map on **page 19**

| ID | Location | Pipe Name | Details | |
|---|---|---|---|---|
| 1 | 382m SE | ST.FERGUS TO LOCHSIDE | Pipe Number: -<br>Pipeline Safety Regulations Number: -<br>Ownership: National Grid<br>Maximum Operating Pressure (Bar): - | Pipeline Diameter (mm): 1200<br>Wall Thickness (mm): -<br>Year of commission: Not specified<br>Abandonment Status: Not abandoned |

*This data is sourced from National Grid.*

## 4.5 Sites determined as Contaminated Land

| Records within 500m | 0 |
|---|---|

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

*This data is sourced from Local Authority records.*

## 4.6 Control of Major Accident Hazards (COMAH)

| Records within 500m | 0 |
|---|---|

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

*This data is sourced from the Health and Safety Executive.*

## 4.7 Regulated explosive sites

| Records within 500m | 0 |
|---|---|

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

*This data is sourced from the Health and Safety Executive.*

## 4.8 Hazardous substance storage/usage

| Records within 500m | 0 |
|---|---|

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

*This data is sourced from Local Authority records.*

## 4.9 Part A(1), IPPC and Historic IPC Authorisations

| Records within 500m | 0 |
|---|---|

Records of Part A installations regulated for the release of substances to the environment.

*This data is sourced from the Scottish Environment Protection Agency.*

## 4.10 Part B Authorisations

| Records within 500m | 0 |
|---|---|

Records of Part B installations regulated for the release of substances to the environment.

*This data is sourced from the Scottish Environment Protection Agency.*

## 4.11 Pollution inventory substances

| Records within 500m | 0 |
|---|---|

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.12 Pollution inventory waste transfers

| Records within 500m | 0 |
|---|---|

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.13 Pollution inventory radioactive waste

| Records within 500m | 0 |
|---|---|

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

# 5 Geology (basic)

## 5.1 Superficial geology (625k)

| Records within 500m | 2 |
|---|---|

Generalised geology data based on BGS's published poster maps of the UK (North and South). Superficial related themes digitised from 1977 first edition Quaternary map (North and South).

| Location | Lex code | Description | Rock type |
|---|---|---|---|
| **On site** | **ALV-CLSS** | **ALLUVIUM** | **CLAY, SILT AND SAND** |
| **On site** | **TILL-DMTN** | **TILL** | **DIAMICTON** |

*This data is sourced from the British Geological Survey.*

## 5.2 Bedrock geology (625k)

| Records within 500m | 2 |
|---|---|

Generalised geology data based on BGS's published poster maps of the UK (North and South). Bedrock related themes created through generalisation of 1:50,000 data.

| Location | Lex code | Description | Rock type |
|---|---|---|---|
| **On site** | **UIIOS-MFIR** | **UNNAMED IGNEOUS INTRUSION, ORDOVICIAN TO SILURIAN** | **MAFIC IGNEOUS-ROCK** |
| 309m NE | SOHI-PSPE | SOUTHERN HIGHLAND GROUP | PSAMMITE AND PELITE |

*This data is sourced from the British Geological Survey.*

# 6 Hydrogeology - Superficial aquifer

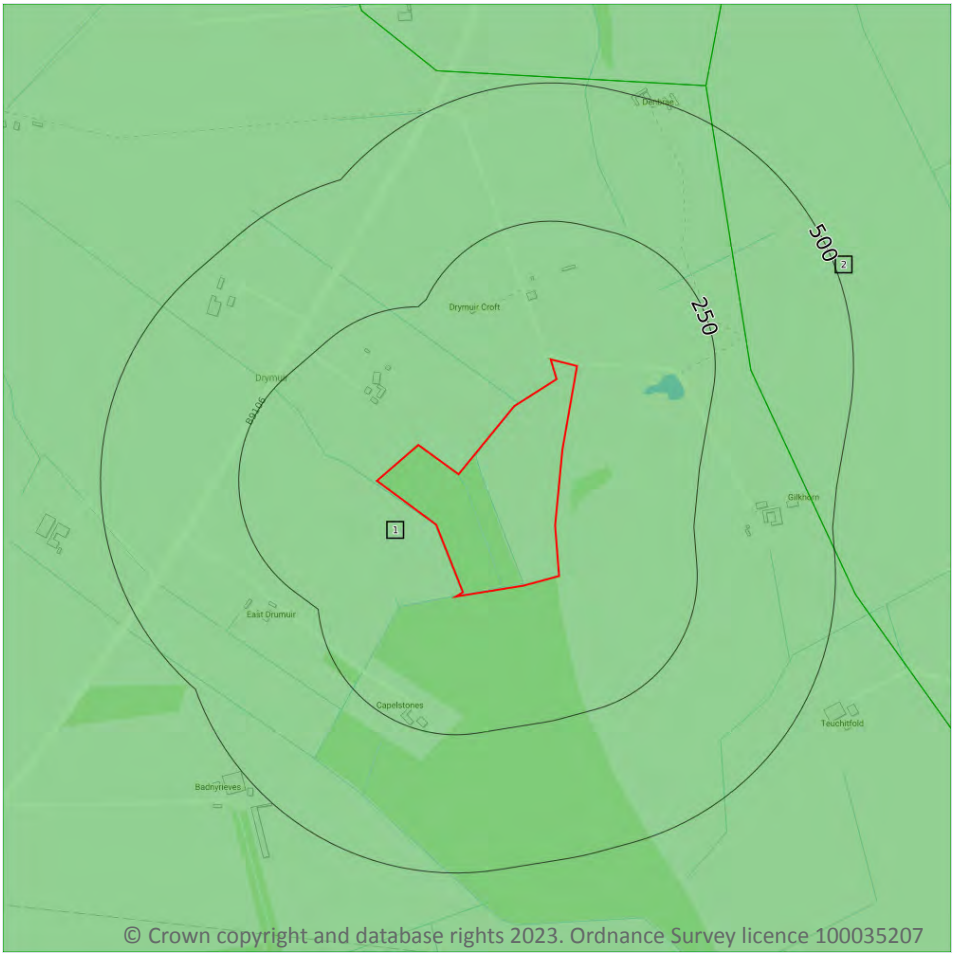
## 6.1 Superficial aquifer

| Records within 500m | 0 |
|---|---|

Records of groundwater classification within superficial geology.

*This data is sourced from the British Geological Survey.*

# Bedrock aquifer




Site Outline

Search buffers in metres (m)

- Highly productive - fissures/discontinuities
- Highly productive - intergranular
- Moderately productive - fissures/discontinuities
- Moderately productive - intergranular
- Low productive - fissures/discontinuities
- Low productive - intergranular
- No significant groundwater

## 6.2 Bedrock aquifer

| Records within 500m | 2 |
|---|---|

Records of groundwater classification within bedrock geology.

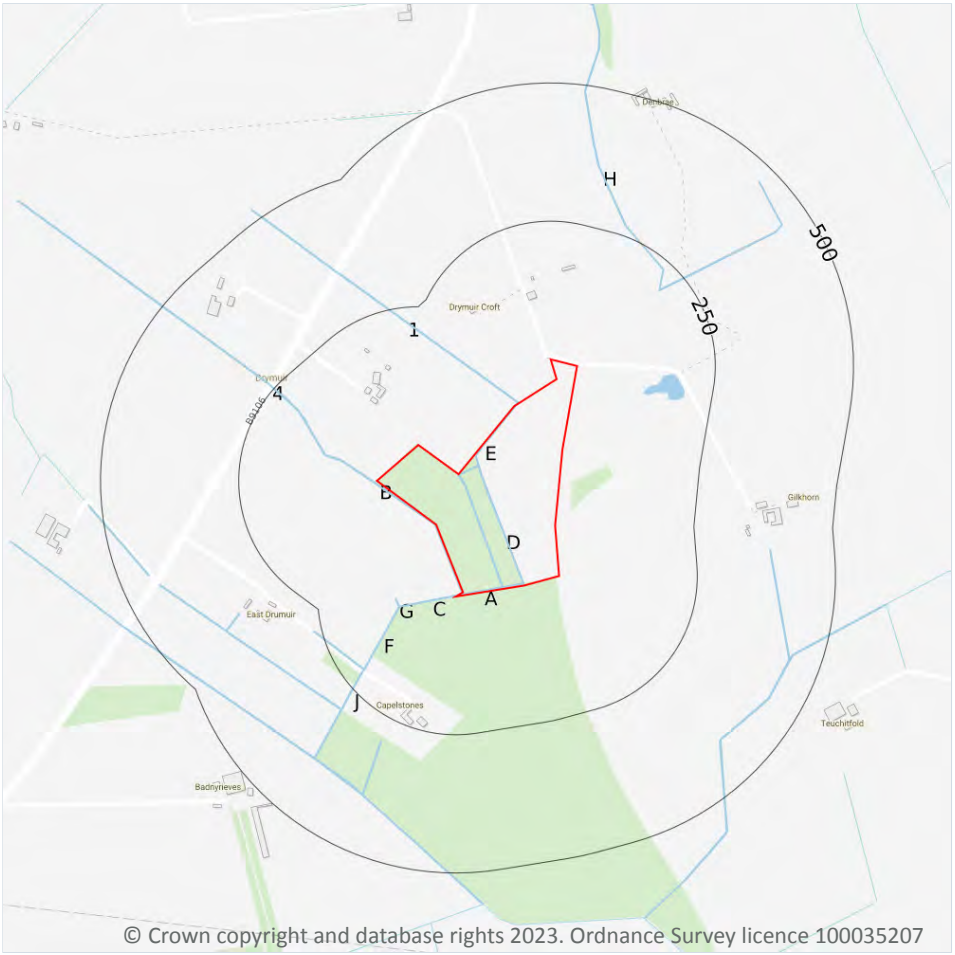
Features are displayed on the Bedrock aquifer map on **page 25**

| ID | Location | Description | Flow | Summary | Rock description |
|---|---|---|---|---|---|
| **1** | **On site** | **Low productivity aquifer** | **Flow is virtually all through fractures and other discontinuities** | **Small amounts of groundwater in near surface weathered zone and secondary fractures; rare springs.** | **UNNAMED IGNEOUS INTRUSION, ORDOVICIAN TO SILURIAN** |

| ID | Location | Description | Flow | Summary | Rock description |
|---|---|---|---|---|---|
| 2 | 309m NE | Low productivity aquifer | Flow is virtually all through fractures and other discontinuities | Small amounts of groundwater in near surface weathered zone and secondary fractures. | SOUTHERN HIGHLAND GROUP |

*This data is sourced from the British Geological Survey.*

# 7 Hydrology




Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

## 7.1 Water Network (OS MasterMap)

| **Records within 250m** | **15** |
|---|---|

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 27**

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| **1** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| **A** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **B** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **C** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **D** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **D** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **E** | **On site** | **Inland river not influenced by normal tidal action.** | **Underground** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **E** | **On site** | **Inland river not influenced by normal tidal action.** | **On ground surface** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| **E** | **On site** | **Inland river not influenced by normal tidal action.** | **Underground** | **Watercourse contains water year round (in normal circumstances)** | **-** |
| F | 104m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| G | 104m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| H | 202m NE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| F | 212m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| J | 212m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| 4 | 249m NW | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | - |

*This data is sourced from the Ordnance Survey.*

## 7.2 Surface water features

| **Records within 250m** | **5** |
|---|---|

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 27**

*This data is sourced from the Ordnance Survey.*

# 8 River flooding

## 8.1 River flooding

| | |
|---|---|
| **Highest risk on site** | **Negligible** |
| **Highest risk within 50m** | **Negligible** |

This is an assessment of flood risk for rivers in Scotland produced using modelled data, provided by Ambiental Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of flooding from rivers presented in the following categories:

- 1 in 30 year (3.33%)
- 1 in 100 year (1%)
- 1 in 250 year (0.4%)
- and 1 in 1,000 year (0.1%)

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Negligible |
| 1 in 250 year | Negligible |
| 1 in 100 year | Negligible |
| 1 in 30 year | Negligible |

*This data is sourced from Ambiental Risk Analytics.*

# 9 Coastal flooding - Coastal flooding

## 9.1 Coastal flooding

| | |
|---|---|
| **Highest risk on site** | **Negligible** |
| **Highest risk within 50m** | **Negligible** |

This is an assessment of coastal flood risk in Scotland produced using modelled data, provided by Ambiental Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of coastal flooding presented in the following categories:

- 1 in 30 year (3.33%)
- 1 in 100 year (1%)
- 1 in 250 year (0.4%)
- and 1 in 1,000 year (0.1%)

The data shown on the map shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Negligible |
| 1 in 250 year | Negligible |
| 1 in 100 year | Negligible |
| 1 in 30 year | Negligible |

*This data is sourced from Ambiental Risk Analytics.*

# 10 Surface water flooding


Site Outline
Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

## 10.1 Surface water flooding

| | |
|---|---|
| **Highest risk on site** | **1 in 30 year, 0.1m - 0.3m** |
| **Highest risk within 50m** | **1 in 30 year, 0.3m - 1.0m** |

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 32**

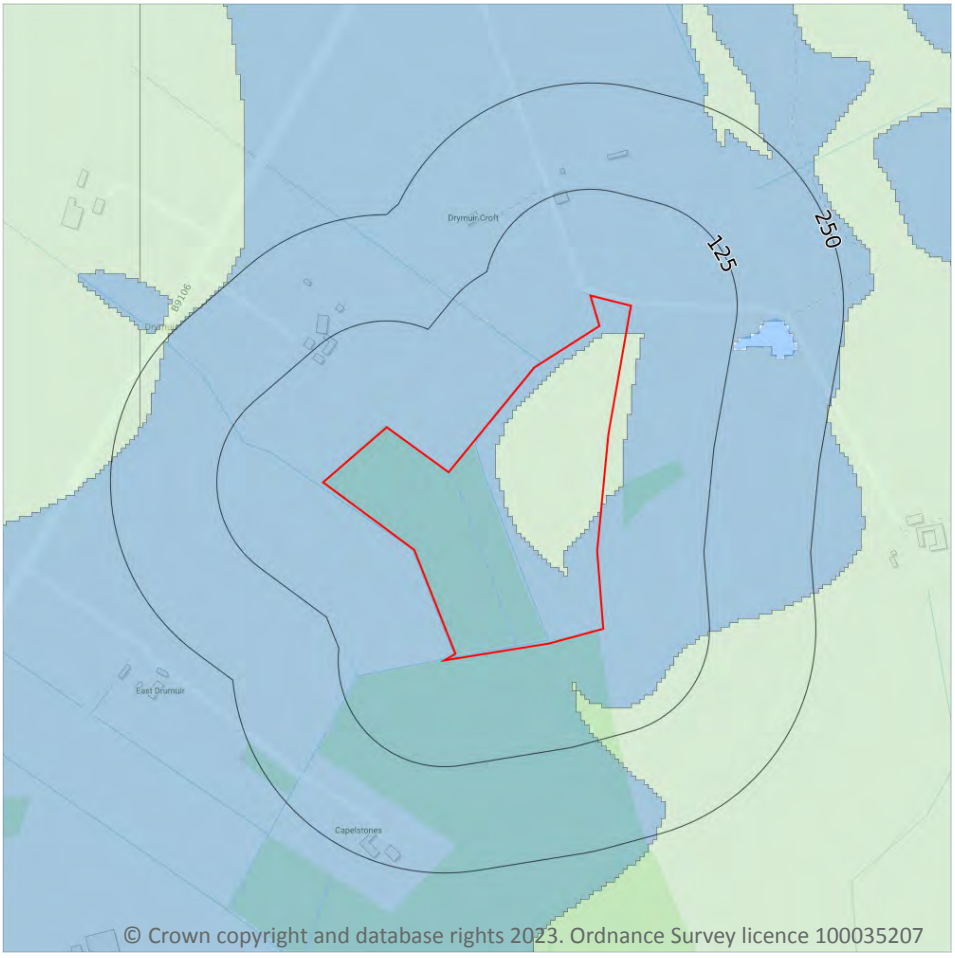
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Between 0.1m and 0.3m |
| 1 in 250 year | Between 0.1m and 0.3m |
| 1 in 100 year | Between 0.1m and 0.3m |
| 1 in 30 year | Between 0.1m and 0.3m |

*This data is sourced from Ambiental Risk Analytics.*

# 11 Groundwater flooding




Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

## 11.1 Groundwater flooding

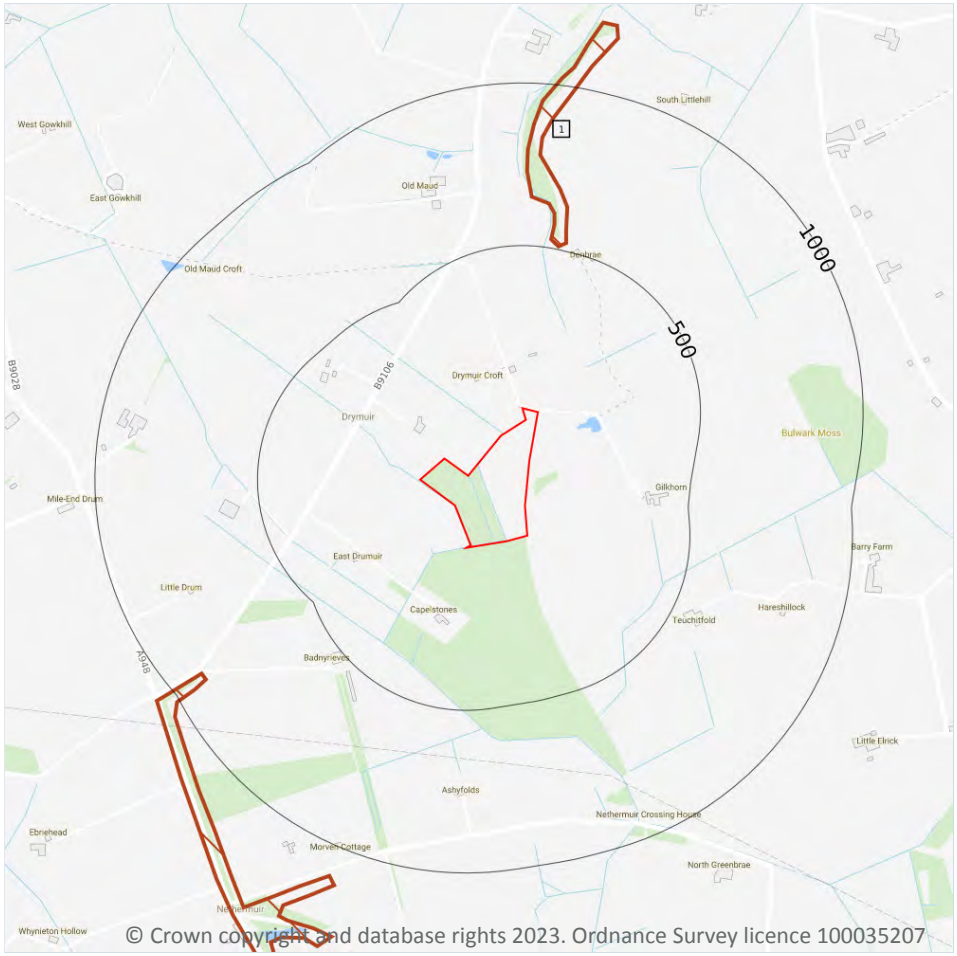
| | |
|---|---|
| **Highest risk on site** | **Low** |
| **Highest risk within 50m** | **Low** |

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 34**

*This data is sourced from Ambiental Risk Analytics.*

# 12 Environmental designations




Site Outline

Search buffers in metres (m)

Designated Ancient Woodland

## 12.1 Sites of Special Scientific Interest (SSSI)

| Records within 2000m | 0 |
|---|---|

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.2 Conserved wetland sites (Ramsar sites)

| Records within 2000m | 0 |
|---|---|

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.3 Special Areas of Conservation (SAC)

| Records within 2000m | 0 |
|---|---|

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.4 Special Protection Areas (SPA)

| Records within 2000m | 0 |
|---|---|

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.5 National Nature Reserves (NNR)

| Records within 2000m | 0 |
|---|---|

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.6 Local Nature Reserves (LNR)

| Records within 2000m | 0 |
|---|---|

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.7 Designated Ancient Woodland

| Records within 2000m | 3 |
|---|---|

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on **page 35**

| ID | Location | Name | Woodland Type |
|---|---|---|---|
| 1 | 510m N | Unknown | Ancient (of semi-natural origin) |
| 2 | 898m SW | Unknown | Long-Established (of plantation origin) |
| - | 1723m S | Unknown | Long-Established (of plantation origin) |

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.8 Biosphere Reserves

| Records within 2000m | 0 |
|---|---|

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.9 Forest Parks

| Records within 2000m | 0 |
|---|---|

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

*This data is sourced from the Forestry Commission.*

## 12.10 Marine Conservation Zones

| Records within 2000m | 0 |
|---|---|

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

# 13 Visual and cultural designations

## 13.1 World Heritage Sites

| Records within 250m | 0 |
|---|---|

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.2 Area of Outstanding Natural Beauty

| Records within 250m | 0 |
|---|---|

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 13.3 National Parks

| Records within 250m | 0 |
|---|---|

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

*This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.*

## 13.4 Listed Buildings

| Records within 250m | 0 |
|---|---|

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.5 Conservation Areas

| Records within 250m | 0 |
|---|---|

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.6 Scheduled Ancient Monuments

| Records within 250m | 0 |
|---|---|

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

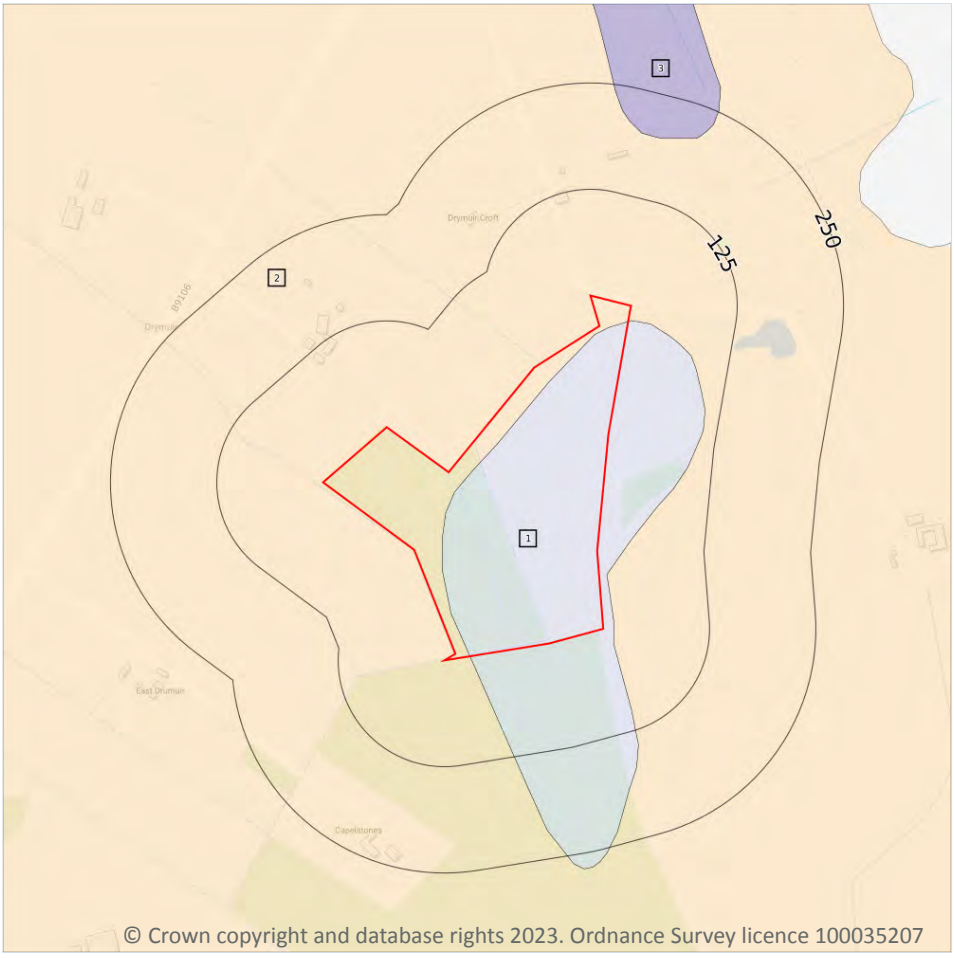
## 13.7 Registered Parks and Gardens

| Records within 250m | 0 |
|---|---|

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

# 14 Agricultural designations




Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 4 - good quality
- Grade 5 - moderate quality
- Grade 6 - poor quality
- Grade 7 - very poor quality

## 14.1 Agricultural Land Classification

| Records within 250m | 3 |
|---|---|

Classification of the quality of agricultural land taking into consideration multiple factors inclusing climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 41**

| ID | Location | Classification | Description |
|---|---|---|---|
| **1** | **On site** | **Grade 5.3** | **Land Suited only to Improved Grassland and Rough Grazings** |
| **2** | **On site** | **Grade 3.2** | **Land Suited to Arable Cropping** |
| 3 | 200m NE | Grade 6.1 | Land Suited only to Improved Grassland and Rough Grazings |

*This data is sourced from the James Hutton Institute.*

## Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

## Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: https://www.groundsure.com/terms-and-conditions-april-2023/.

GREEN VOLT

# Appendix 8.5

## Moss at Clockhill Groundsure Report

Onshore EIA Report: Volume 3

Groundsure
LOCATION INTELLIGENCE

Enviro
Insight

# Moss at Clockhill,

## Order Details

**Date:** 14/04/2023

**Your ref:** E5475_PO19981

**Our Ref:** GCR-MEM-667-B6Y-LCN

## Site Details

**Location:** 389945 845477

**Area:** 3.12 ha

**Authority:** Aberdeenshire Council






Contact us with any questions at:
info@groundsure.com
01273 257 755

# Summary of findings

| Page | Section | Past land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 11 | 1.1 | Historical industrial land uses | 0 | 0 | 0 | 0 | - |
| 11 | 1.2 | Historical tanks | 0 | 0 | 0 | 0 | - |
| 11 | 1.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 12 | 1.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 12 | 1.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| 12 | 1.6 | Historical military land | 0 | 0 | 0 | 0 | - |
| Page | Section | Past land use - un-grouped | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 13 | 2.1 | Historical industrial land uses | 0 | 0 | 0 | 0 | - |
| 13 | 2.2 | Historical tanks | 0 | 0 | 0 | 0 | - |
| 13 | 2.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 13 | 2.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 14 | 2.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| Page | Section | Waste and landfill | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 15 | 3.1 | Active or recent landfill | 0 | 0 | 0 | 0 | - |
| 15 | 3.2 | Historical landfill (BGS records) | 0 | 0 | 0 | 0 | - |
| 15 | 3.3 | Historical landfill (LA/mapping records) | 0 | 0 | 0 | 0 | - |
| 15 | 3.4 | Licensed waste sites | 0 | 0 | 0 | 0 | - |
| 15 | 3.5 | Historical waste sites | 0 | 0 | 0 | 0 | - |
| Page | Section | Current industrial land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **16** | **4.1** | **Recent industrial land uses** | 0 | 0 | 1 | - | - |
| 17 | 4.2 | Current or recent petrol stations | 0 | 0 | 0 | 0 | - |
| 17 | 4.3 | Electricity cables | 0 | 0 | 0 | 0 | - |
| **17** | **4.4** | **Gas pipelines** | 0 | 0 | 0 | 1 | - |
| 17 | 4.5 | Sites determined as Contaminated Land | 0 | 0 | 0 | 0 | - |
| 17 | 4.6 | Control of Major Accident Hazards (COMAH) | 0 | 0 | 0 | 0 | - |
| 18 | 4.7 | Regulated explosive sites | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 18 | 4.8 | Hazardous substance storage/usage | 0 | 0 | 0 | 0 | - |
| 18 | 4.9 | Part A(1), IPPC and Historic IPC Authorisations | 0 | 0 | 0 | 0 | - |
| 18 | 4.10 | Part B Authorisations | 0 | 0 | 0 | 0 | - |
| 18 | 4.11 | Pollution inventory substances | 0 | 0 | 0 | 0 | - |
| 19 | 4.12 | Pollution inventory waste transfers | 0 | 0 | 0 | 0 | - |
| 19 | 4.13 | Pollution inventory radioactive waste | 0 | 0 | 0 | 0 | - |
| Page | Section | Geology (basic) | | | | | |
| **20** | **5.1** | **Superficial geology (625k)** | Identified (within 500m) | | | | |
| **20** | **5.2** | **Bedrock geology (625k)** | Identified (within 500m) | | | | |
| Page | Section | Hydrogeology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 21 | 6.1 | Superficial aquifer | None (within 500m) | | | | |
| **22** | **6.2** | **Bedrock aquifer** | Identified (within 500m) | | | | |
| Page | Section | Hydrology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **23** | **7.1** | **Water Network (OS MasterMap)** | 0 | 1 | 2 | - | - |
| **24** | **7.2** | **Surface water features** | 0 | 1 | 1 | - | - |
| Page | Section | River flooding | | | | | |
| 25 | 8.1 | River flooding | Negligible (within 50m) | | | | |
| Page | Section | Coastal flooding | | | | | |
| 26 | 9.1 | Coastal flooding | Negligible (within 50m) | | | | |
| Page | Section | Surface water flooding | | | | | |
| **27** | **10.1** | **Surface water flooding** | 1 in 30 year, 0.3m - 1.0m (within 50m) | | | | |
| Page | Section | Groundwater flooding | | | | | |
| **29** | **11.1** | **Groundwater flooding** | Low (within 50m) | | | | |
| Page | Section | Environmental designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 30 | 12.1 | Sites of Special Scientific Interest (SSSI) | 0 | 0 | 0 | 0 | 0 |
| 31 | 12.2 | Conserved wetland sites (Ramsar sites) | 0 | 0 | 0 | 0 | 0 |
| 31 | 12.3 | Special Areas of Conservation (SAC) | 0 | 0 | 0 | 0 | 0 |
| 31 | 12.4 | Special Protection Areas (SPA) | 0 | 0 | 0 | 0 | 0 |
| 31 | 12.5 | National Nature Reserves (NNR) | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 32 | 12.6 | Local Nature Reserves (LNR) | 0 | 0 | 0 | 0 | 0 |
| **32** | **12.7** | **Designated Ancient Woodland** | 0 | 0 | 0 | 0 | 2 |
| 32 | 12.8 | Biosphere Reserves | 0 | 0 | 0 | 0 | 0 |
| 32 | 12.9 | Forest Parks | 0 | 0 | 0 | 0 | 0 |
| 33 | 12.10 | Marine Conservation Zones | 0 | 0 | 0 | 0 | 0 |
| Page | Section | Visual and cultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 34 | 13.1 | World Heritage Sites | 0 | 0 | 0 | - | - |
| 34 | 13.2 | Area of Outstanding Natural Beauty | 0 | 0 | 0 | - | - |
| 34 | 13.3 | National Parks | 0 | 0 | 0 | - | - |
| 34 | 13.4 | Listed Buildings | 0 | 0 | 0 | - | - |
| 35 | 13.5 | Conservation Areas | 0 | 0 | 0 | - | - |
| 35 | 13.6 | Scheduled Ancient Monuments | 0 | 0 | 0 | - | - |
| 35 | 13.7 | Registered Parks and Gardens | 0 | 0 | 0 | - | - |
| Page | Section | Agricultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **36** | **14.1** | **Agricultural Land Classification** | Grade 3.2 (within 250m) | | | | |

## Recent aerial photograph


Capture Date: 29/05/2018

Site Area: 3.12ha

# Recent site history - 2015 aerial photograph


Capture Date: 15/05/2015

Site Area: 3.12ha

# Recent site history - 2011 aerial photograph


Capture Date: 07/05/2011

Site Area: 3.12ha

# Recent site history - 2003 aerial photograph


Capture Date: 13/07/2003

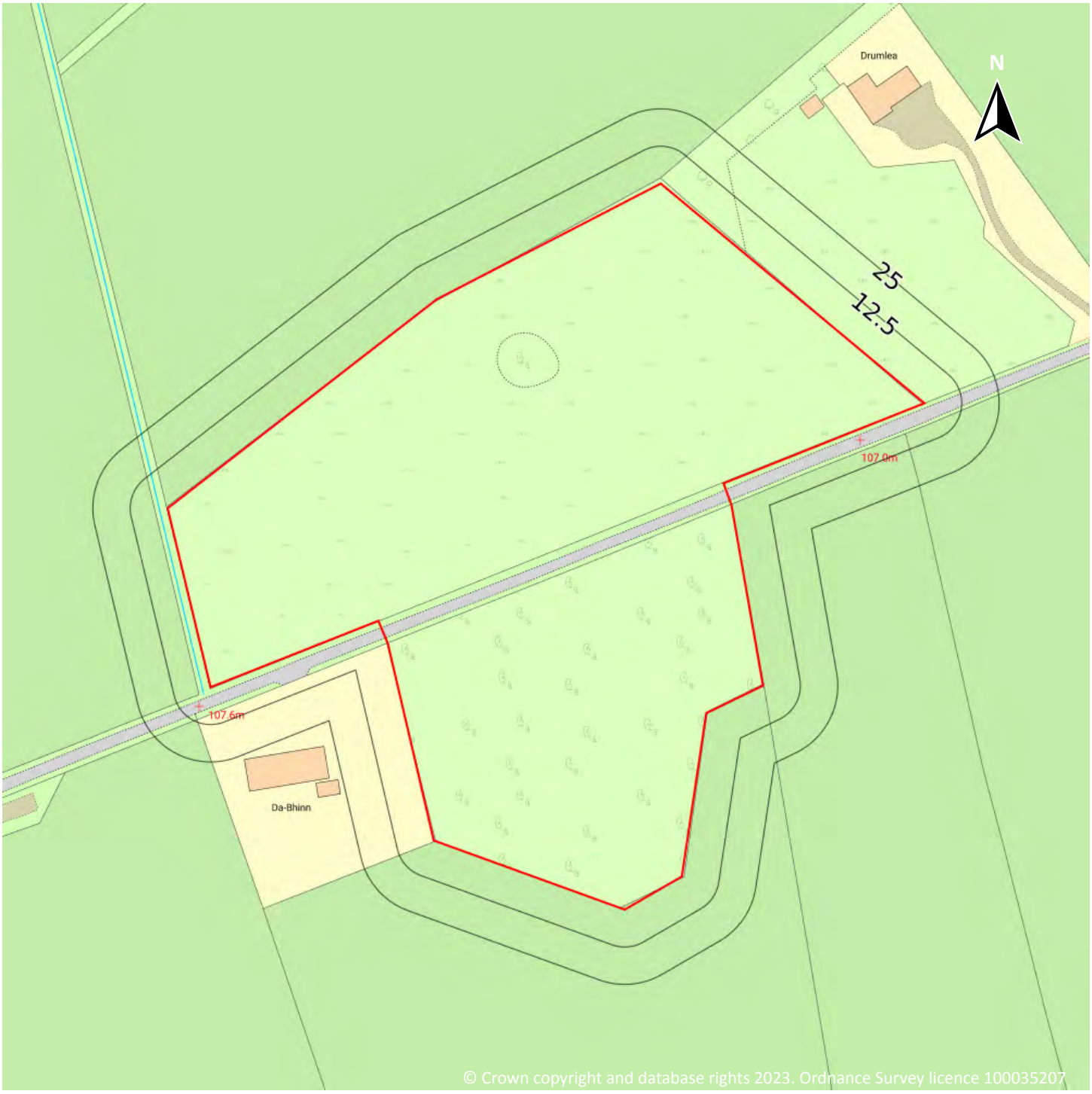
Site Area: 3.12ha

# Recent site history - 2001 aerial photograph


Capture Date: 12/05/2001

Site Area: 3.12ha

## OS MasterMap site plan




Site Area: 3.12ha

# 1 Past land use

## 1.1 Historical industrial land uses

| Records within 500m | 0 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.2 Historical tanks

| Records within 500m | 0 |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.3 Historical energy features

| Records within 500m | 0 |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.5 Historical garages

| Records within 500m | 0 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.6 Historical military land

| Records within 500m | 0 |
|---|---|

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

*This data is sourced from Ordnance Survey / Groundsure / other sources.*

# 2 Past land use - un-grouped

## 2.1 Historical industrial land uses

| Records within 500m | 0 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.2 Historical tanks

| Records within 500m | 0 |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.3 Historical energy features

| Records within 500m | 0 |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.5 Historical garages

| Records within 500m | 0 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

# 3 Waste and landfill

## 3.1 Active or recent landfill

| Records within 500m | 0 |
|---|---|

Active or recently closed landfill sites under Scottish Environment Protection (SEPA) regulation.

*This data is sourced from the Scottish Environment Protection Agency.*

## 3.2 Historical landfill (BGS records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

*This data is sourced from the British Geological Survey.*

## 3.3 Historical landfill (LA/mapping records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified from Local Authority records and high detail historical mapping.

*This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.*

## 3.4 Licensed waste sites

| Records within 500m | 0 |
|---|---|

Active or recently closed waste sites under Scottish Environment Protection Acency (SEPA) regulation.

*This data is sourced from the Scottish Environment Protection Agency.*

## 3.5 Historical waste sites

| Records within 500m | 0 |
|---|---|

Waste site records derived from Local Authority planning records and high detail historical mapping.

*This data is sourced from Ordnance Survey/Groundsure and Local Authority records.*

# 4 Current industrial land use


Site Outline

Search buffers in metres (m)

Recent industrial land uses

Gas pipelines

## 4.1 Recent industrial land uses

| Records within 250m | 1 |
|---|---|

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 16**

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| 1 | 165m E | Mile End Motors Ltd | Mile End Drum, Maud, Aberdeenshire, AB42 5RH | Vehicle Repair, Testing and Servicing | Repair and Servicing |

*This data is sourced from Ordnance Survey.*

## 4.2 Current or recent petrol stations

| Records within 500m | 0 |
|---|---|

Open, closed, under development and obsolete petrol stations.

*This data is sourced from Experian.*

## 4.3 Electricity cables

| Records within 500m | 0 |
|---|---|

High voltage underground electricity transmission cables.

*This data is sourced from National Grid.*

## 4.4 Gas pipelines

| Records within 500m | 1 |
|---|---|

High pressure underground gas transmission pipelines.

Features are displayed on the Current industrial land use map on **page 16**

| ID | Location | Pipe Name | Details | |
|---|---|---|---|---|
| 2 | 366m NW | ST. FERGUS TO ABERDEEN | Pipe Number: -<br>Pipeline Safety Regulations Number: -<br>Ownership: National Grid<br>Maximum Operating Pressure (Bar): - | Pipeline Diameter (mm): 1050<br>Wall Thickness (mm): -<br>Year of commission: Not specified<br>Abandonment Status: Not abandoned |

*This data is sourced from National Grid.*

## 4.5 Sites determined as Contaminated Land

| Records within 500m | 0 |
|---|---|

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

*This data is sourced from Local Authority records.*

## 4.6 Control of Major Accident Hazards (COMAH)

| Records within 500m | 0 |
|---|---|

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

*This data is sourced from the Health and Safety Executive.*

## 4.7 Regulated explosive sites

| Records within 500m | 0 |
|---|---|

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

*This data is sourced from the Health and Safety Executive.*

## 4.8 Hazardous substance storage/usage

| Records within 500m | 0 |
|---|---|

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

*This data is sourced from Local Authority records.*

## 4.9 Part A(1), IPPC and Historic IPC Authorisations

| Records within 500m | 0 |
|---|---|

Records of Part A installations regulated for the release of substances to the environment.

*This data is sourced from the Scottish Environment Protection Agency.*

## 4.10 Part B Authorisations

| Records within 500m | 0 |
|---|---|

Records of Part B installations regulated for the release of substances to the environment.

*This data is sourced from the Scottish Environment Protection Agency.*

## 4.11 Pollution inventory substances

| Records within 500m | 0 |
|---|---|

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.12 Pollution inventory waste transfers

| Records within 500m | 0 |
|---|---|

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.13 Pollution inventory radioactive waste

| Records within 500m | 0 |
|---|---|

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

# 5 Geology (basic)

## 5.1 Superficial geology (625k)

| Records within 500m | 1 |
|---|---|

Generalised geology data based on BGS's published poster maps of the UK (North and South). Superficial related themes digitised from 1977 first edition Quaternary map (North and South).

| Location | Lex code | Description | Rock type |
|---|---|---|---|
| **On site** | **TILL-DMTN** | **TILL** | **DIAMICTON** |

*This data is sourced from the British Geological Survey.*

## 5.2 Bedrock geology (625k)

| Records within 500m | 1 |
|---|---|

Generalised geology data based on BGS's published poster maps of the UK (North and South). Bedrock related themes created through generalisation of 1:50,000 data.

| Location | Lex code | Description | Rock type |
|---|---|---|---|
| **On site** | **UIIOS-MFIR** | **UNNAMED IGNEOUS INTRUSION, ORDOVICIAN TO SILURIAN** | **MAFIC IGNEOUS-ROCK** |

*This data is sourced from the British Geological Survey.*

# 6 Hydrogeology - Superficial aquifer

## 6.1 Superficial aquifer

| Records within 500m | 0 |
|---|---|

Records of groundwater classification within superficial geology.

*This data is sourced from the British Geological Survey.*

# Bedrock aquifer




Site Outline

Search buffers in metres (m)

- Highly productive - fissures/discontinuities
- Highly productive - intergranular
- Moderately productive - fissures/discontinuities
- Moderately productive - intergranular
- Low productive - fissures/discontinuities
- Low productive - intergranular
- No significant groundwater

## 6.2 Bedrock aquifer

**Records within 500m** **1**

Records of groundwater classification within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 22**

| ID | Location | Description | Flow | Summary | Rock description |
|---|---|---|---|---|---|
| **1** | **On site** | **Low productivity aquifer** | **Flow is virtually all through fractures and other discontinuities** | **Small amounts of groundwater in near surface weathered zone and secondary fractures; rare springs.** | **UNNAMED IGNEOUS INTRUSION, ORDOVICIAN TO SILURIAN** |

*This data is sourced from the British Geological Survey.*

# 7 Hydrology


Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

## 7.1 Water Network (OS MasterMap)

| Records within 250m | 3 |
|---|---|

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 23**

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| A | 2m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| 1 | 248m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| 2 | 249m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

*This data is sourced from the Ordnance Survey.*

## 7.2 Surface water features

| **Records within 250m** | **2** |
|---|---|

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 23**

*This data is sourced from the Ordnance Survey.*

# 8 River flooding

## 8.1 River flooding

| | |
|---|---|
| **Highest risk on site** | **Negligible** |
| **Highest risk within 50m** | **Negligible** |

This is an assessment of flood risk for rivers in Scotland produced using modelled data, provided by Ambiental Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of flooding from rivers presented in the following categories:

- 1 in 30 year (3.33%)
- 1 in 100 year (1%)
- 1 in 250 year (0.4%)
- and 1 in 1,000 year (0.1%)

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Negligible |
| 1 in 250 year | Negligible |
| 1 in 100 year | Negligible |
| 1 in 30 year | Negligible |

*This data is sourced from Ambiental Risk Analytics.*

# 9 Coastal flooding - Coastal flooding

## 9.1 Coastal flooding

| | |
|---|---|
| **Highest risk on site** | **Negligible** |
| **Highest risk within 50m** | **Negligible** |

This is an assessment of coastal flood risk in Scotland produced using modelled data, provided by Ambiental Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of coastal flooding presented in the following categories:

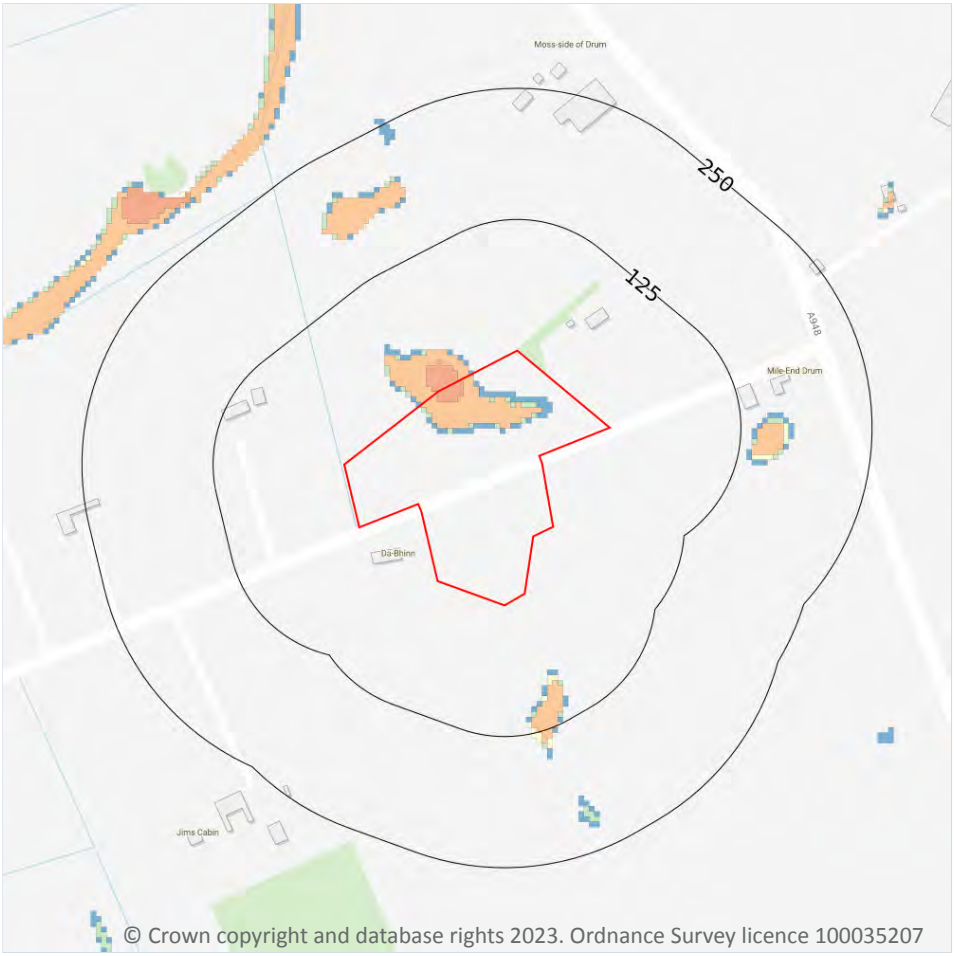
- 1 in 30 year (3.33%)
- 1 in 100 year (1%)
- 1 in 250 year (0.4%)
- and 1 in 1,000 year (0.1%)

The data shown on the map shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Negligible |
| 1 in 250 year | Negligible |
| 1 in 100 year | Negligible |
| 1 in 30 year | Negligible |

*This data is sourced from Ambiental Risk Analytics.*

# 10 Surface water flooding




Site Outline

Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

## 10.1 Surface water flooding

| | |
|---|---|
| **Highest risk on site** | **1 in 30 year, 0.3m - 1.0m** |
| **Highest risk within 50m** | **1 in 30 year, 0.3m - 1.0m** |

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 27**

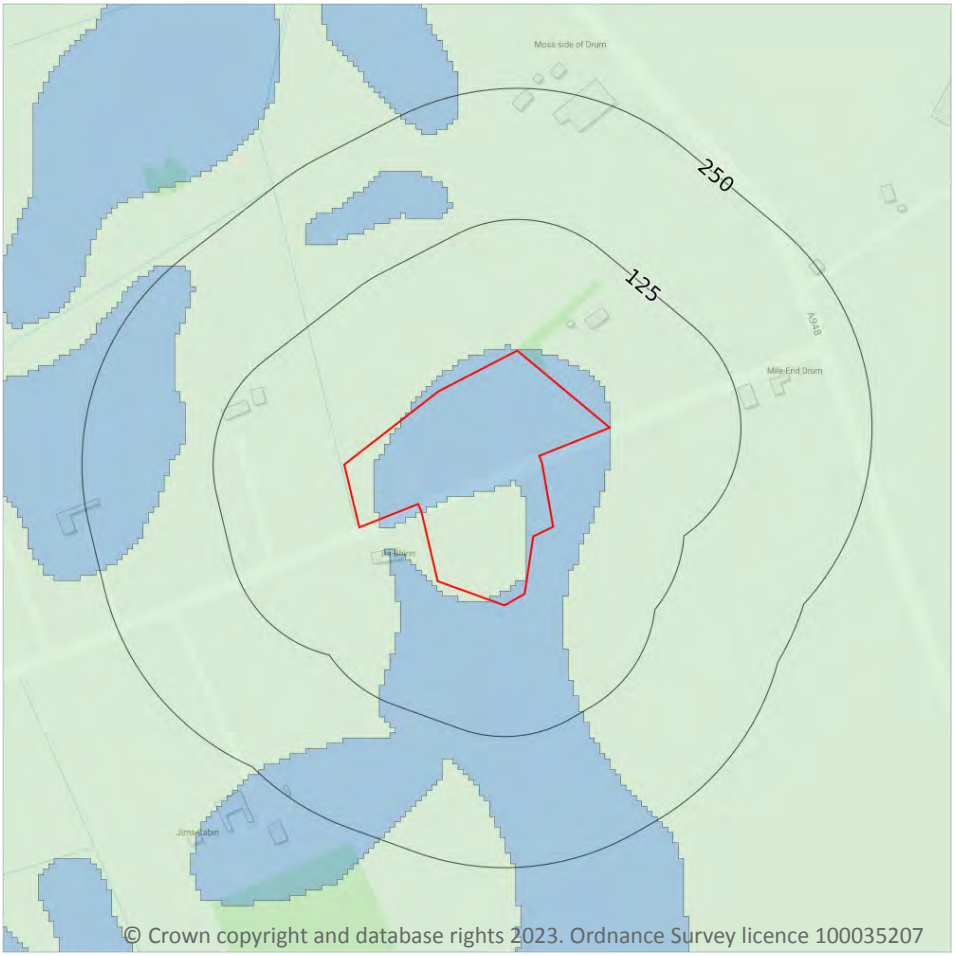
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Between 0.3m and 1.0m |
| 1 in 250 year | Between 0.3m and 1.0m |
| 1 in 100 year | Between 0.3m and 1.0m |
| 1 in 30 year | Between 0.3m and 1.0m |

*This data is sourced from Ambiental Risk Analytics.*

# 11 Groundwater flooding




Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

## 11.1 Groundwater flooding

| | |
|---|---|
| **Highest risk on site** | **Low** |
| **Highest risk within 50m** | **Low** |

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 29**

*This data is sourced from Ambiental Risk Analytics.*

# 12 Environmental designations


Site Outline

Search buffers in metres (m)

Designated Ancient Woodland

## 12.1 Sites of Special Scientific Interest (SSSI)

| Records within 2000m | 0 |
|---|---|

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.2 Conserved wetland sites (Ramsar sites)

| Records within 2000m | 0 |
|---|---|

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.3 Special Areas of Conservation (SAC)

| Records within 2000m | 0 |
|---|---|

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.4 Special Protection Areas (SPA)

| Records within 2000m | 0 |
|---|---|

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.5 National Nature Reserves (NNR)

| Records within 2000m | 0 |
|---|---|

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.6 Local Nature Reserves (LNR)

| Records within 2000m | 0 |
|---|---|

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.7 Designated Ancient Woodland

| Records within 2000m | 2 |
|---|---|

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on **page 30**

| ID | Location | Name | Woodland Type |
|---|---|---|---|
| 1 | 646m SE | Unknown | Long-Established (of plantation origin) |
| - | 1854m NE | Unknown | Ancient (of semi-natural origin) |

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.8 Biosphere Reserves

| Records within 2000m | 0 |
|---|---|

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 12.9 Forest Parks

| Records within 2000m | 0 |
|---|---|

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

*This data is sourced from the Forestry Commission.*

## 12.10 Marine Conservation Zones

| Records within 2000m | 0 |
|---|---|

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

# 13 Visual and cultural designations

## 13.1 World Heritage Sites

| Records within 250m | 0 |
|---|---|

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.2 Area of Outstanding Natural Beauty

| Records within 250m | 0 |
|---|---|

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 13.3 National Parks

| Records within 250m | 0 |
|---|---|

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

*This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.*

## 13.4 Listed Buildings

| Records within 250m | 0 |
|---|---|

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.5 Conservation Areas

| Records within 250m | 0 |
|---|---|

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 13.6 Scheduled Ancient Monuments

| Records within 250m | 0 |
|---|---|

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

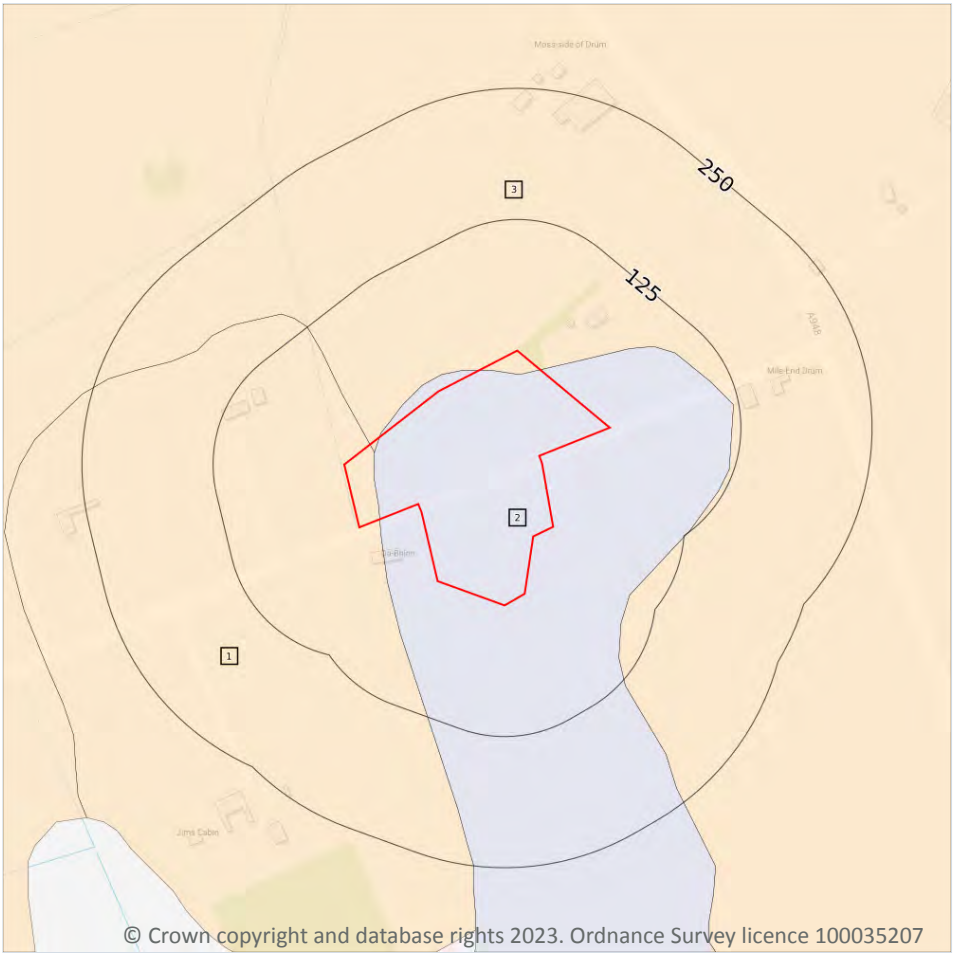
## 13.7 Registered Parks and Gardens

| Records within 250m | 0 |
|---|---|

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

# 14 Agricultural designations




Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 4 - good quality
- Grade 5 - moderate quality
- Grade 6 - poor quality
- Grade 7 - very poor quality

## 14.1 Agricultural Land Classification

| Records within 250m | 3 |
|---|---|

Classification of the quality of agricultural land taking into consideration multiple factors inclusing climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 36**

| ID | Location | Classification | Description |
|---|---|---|---|
| 1 | On site | Grade 3.1 | Land Suited to Arable Cropping |
| 2 | On site | Grade 5.3 | Land Suited only to Improved Grassland and Rough Grazings |
| 3 | On site | Grade 3.2 | Land Suited to Arable Cropping |

*This data is sourced from the James Hutton Institute.*

## Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

## Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: https://www.groundsure.com/terms-and-conditions-april-2023/.

GREEN VOLT

# Appendix 11.1

## Archaeological Walkover Survey Report

Onshore EIA Report: Volume 3

# Green Volt Cable Route, Aberdeenshire:

# Archaeological Walkover Survey Report

*AOC Project Number: 27057*

*June 2023*

AOC Archaeology Group

ARCHAEOLOGY | HERITAGE | CONSERVATION

# Green Volt Cable Route, Aberdeenshire:

# Archaeological Walkover Survey Report

| | |
|---|---|
| **On Behalf of:** | **Green Cat Renewables Ltd** |
| **National Grid Reference (NGR):** | **NJ 82834 44532 to NK 11443 49014** |
| **AOC Project No:** | **27057** |
| **Prepared by:** | **Sam Williamson** |
| **Illustrations by:** | **Sam Williamson** |
| **Date of Report:** | **June 2023** |

**This document has been prepared in accordance with AOC standard operating procedures.**

| | | |
|---|---|---|
| **Author: Sam Williamson** | **Date:** | **June 2023** |
| **Approved by: Vicky Oleksy** | **Date:** | **June 2023** |
| **Draft/Final Report Stage: Draft** | **Date:** | **June 2023** |

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# 1. INTRODUCTION

## 1.1. Proposed Development Site

1.1.1. AOC Archaeology Group was commissioned by Green Cat Renewables Ltd to undertake an archaeological walkover survey of a proposed sub-surface cable route. The proposed cable route (hereafter referred to as "the Site" where appropriate) measures approximately 35km long, leading east from the New Deer Substation (NGR: NJ 82834 44532) to the coastline north of Peterhead (NK 11443 49014; **Figure 1**).

1.1.2. The Site crosses land predominantly in agricultural use, both for pasture and for crop, with some small areas of commercial forestry plantation either extant or felled.

1.1.3. There are sixteen previously recorded non-designated heritage assets within the Site that comprise predominantly post-medieval settlement, agricultural and industrial remains that include farmsteads, cottages, rig and furrow cultivation, mills, quarries, aqueducts, lades and a canal (**Assets 15**, **23**, **27**, **35**, **37**, **41**, **43**, **46**, **66**, **81**, **89**, **97**, **103**, **108** and **115**). One prehistoric asset (**Asset 116**), a since-destroyed souterrain, was also recorded within the Site.

1.1.4. Considering the summer time date for the walkover survey and the agricultural nature of much of the Site, it was determined that much of the Site would not be directly accessible due to the presence of field crops. Prior to the commencement of the survey, study of the Site using aerial photography and satellite imagery was undertaken to select areas that appeared to be in improved or rough pasture where walkover survey might be feasible, and to target areas where known heritage assets were present to assess their visibility and condition. Nineteen such areas were identified (**Figure 2**), with eight areas (**Areas 2**, **8**, **9** and **15**-**19**) thought to be accessible for direct walkover survey and eleven areas (**Areas 1**, **3**-**7** and **10**-**14**) where rapid assessment from nearby roads was expected to be possible.

1.1.5. The site visit confirmed that the majority of the Site was under maturing field crops or in tall pasture and could not be directly accessed. This included several of the selected Areas noted above. Three further assets were identified during the walkover survey, comprising two modern field drains (**Assets 125** and **126**) and a possible relict cut drainage ditch (**Asset 127**).

## 1.2. Development Proposal and Cultural Heritage Assessment

1.2.1. The Proposed Development would comprise the installation of a sub-surface electric cable as part of onshore infrastructure for an offshore wind farm. A full Cultural Heritage Assessment for this proposal in its entirety will be prepared separately by the client. AOC Archaeology Group have been commissioned solely to undertake the walkover survey element of the works. The walkover survey report will be used by the client to inform the Cultural Heritage assessment and mitigation proposals where required.

## 1.3. Planning Considerations Pertaining to the Site

1.3.1. The local planning authority Aberdeenshire Council is advised on archaeological matters by the Aberdeenshire Council Archaeology Service (ACAS). Any requirement for archaeological work either preceding or during development would be determined by ACAS. ACAS were consulted on the proposed methodology of this walkover survey in June 2023 and agreed to the approach.

1.3.2. There are sixteen previously recorded non-designated heritage assets within the Site that comprise

predominantly post-medieval settlement, agricultural and industrial remains that include farmsteads, cottages, rig and furrow cultivation, mills, quarries, aqueducts, lades and a canal (**Assets 15**, **23**, **27**, **35**, **37**, **41**, **43**, **46**, **66**, **81**, **89**, **97**, **103**, **108** and **115**). One prehistoric asset (**Asset 116**), a since-destroyed souterrain, was also recorded within the Site.

## 1.4. Limitations of Scope

1.4.1. This assessment is based upon data obtained from publicly accessible archives as described in the *Data Sources* in Section 4.3. Historic Environment Record (HER) data from ACAS was supplied to AOC Archaeology Group by the client. Data from the National Record for the Historic Environment (NRHE) as held by HES was obtained on 25th June 2023. Information on designated assets was downloaded from HES's GIS portal on 26th June 2023. The information presented in the asset and event gazetteer (**Appendix 1**) regarding known heritage assets and events is current to these dates.

1.4.2. As noted above it has not been possible to undertake a walkover survey of the entire Site due to the majority of it being under crop or long pasture grass. As such site visits and walkover survey have been limited to areas shown on Figure 2. Some of these areas were also under maturing crop and high pasture and as such ground visibility was limited. These limitations are noted below in below in Section 4. Mitigation measures proposed will take account of these limitations.

1.4.3. It should be noted that this report has been prepared under the express instructions and solely for the use of Green Cat Renewables Ltd and their partners. All the work carried out in this report is based upon AOC Archaeology Group's professional knowledge and understanding of current and relevant United Kingdom standards and codes, technology and legislation.

1.4.4. Changes in these areas may occur in the future and cause changes to the conclusions, advice or recommendations given. AOC Archaeology Group does not accept responsibility for advising Green Cat Renewables Ltd or associated parties of the facts or implications of any such changes in the future.

# 2. OBJECTIVES

3.1 The main objective of the archaeological walkover survey was to identify and map the extent of any upstanding archaeological remains within the Site, both previously recorded and as yet unknown.

# 3. METHODOLOGY

## 3.1. Standards

3.1.1. AOC Archaeology Group conforms to the standards of professional conduct outlined in the Chartered Institute for Archaeologists' (CIfA) Code of Conduct (CIfA 2019, updated 2022), and Regulations for Professional Conduct (2019, updated 2021), the CIfA Standard and Guidance for Historic Environment Desk Based Assessment (CIfA 2014, updated 2020), and the CIfA Standard and guidance for commissioning work on, or providing consultancy advice on, archaeology and the historic environment' (CIfA 2014, updated 2020), and other relevant guidance.

3.1.2. AOC Archaeology Group is a Registered Organisation of the CIfA. This status ensures that there is regular monitoring and approval by external peers of our internal systems, standards and skills development.

3.1.3. AOC is ISO 9001:2015 accredited, in recognition of the Company's Quality Management System.

## 3.2. Data Sources

3.2.1. The following data sources were consulted during preparation of this walkover survey report:

- HES, for:
  - designated heritage asset data.
- Canmore and Pastmap, hosted by HES, for:
  - NRHE data and HER data (including designated and non-designated assets).
- ACAS (via the client), for
  - HER data (including designated and non-designated assets).
- National Map Library (National Library of Scotland), for:
  - online Ordnance Survey maps (1st Edition, small and large-scale).
- Google Earth Pro for:
  - current and historic satellite imagery and aerial photographs.
- National Collection of Aerial Photography (NCAP), for:
  - aerial photographs.
- Scottish Remote Sensing Portal, for:
  - LiDAR imagery for the Site.

## 3.3. Report Structure

3.3.1. Each heritage asset (referred to as an "Asset") and each previous archaeological investigation (referred to as an "Event") referred to in the text is listed in the Gazetteer in **Appendix 2**. Each has been assigned an 'Asset/Event No.' unique to this assessment, and the Gazetteer includes information regarding the type, period, grid reference, NRHE number, HER number, protective designation, and other descriptive information, as derived from the consulted sources. HER data was obtained by the client and supplied to AOC Archaeology Group for use in the assessment.

3.3.2. Each heritage asset and event referred to in the text, and each rapid assessment survey area and walkover survey area, is plotted on **Figures 2-6** at the end of the report, using the assigned Asset/Event numbers. The Site is shown outlined in red.

3.3.3. All sources consulted during the assessment, including publications, archived records, photographic and cartographic evidence, are listed amongst the *References* in Section 6.

# 4. SURVEY

## 4.1. Rapid Assessment Areas and Previously Known Heritage Assets

4.1.1. Both the rapid assessment and walkover survey were undertaken on the 20th and 21st June 2023. The weather was generally fine with occasional short heavy showers but visibility for the duration was generally excellent.

4.1.2. The rapid assessment areas (**Areas 1**, **3**-**7** and **10**-**14**) were viewed from the nearest road sides. These areas

typically comprised agricultural fields in use for cereal crop, grass for hay-making, or pastured fields for livestock (**Plate 1**). No visible upstanding structural remains were observed within the specified areas.

4.1.3. Of the previously recorded heritage assets within the Site, only three were observed during the site visit. These comprise two areas of designed landscape (**Assets 35** and **89**), the visible remnants of which comprise mature beech trees situated at the road sides. The third asset, a section of the Ugie canal (**Asset 103**), was partially observed within Area 18.

## 4.2. Walkover Survey Areas

*Area 2*

4.2.1. The west extent of Area 2 comprises a small pasture field that sloped downhill to the south. The very slight remains of a broad depressed linear ditch (**Asset 127**) under grass were observed (**Plate 2**). This is aligned north-south and may be the remnants of an open-cut drain of unknown date that would have drained water downhill to the ditch at the base of the hill, which in turn feeds the Little Water watercourse to the east. The east extent of Area 2 was under tall cereal crop and could not be accessed (**Plate 3**).

*Area 8*

4.2.2. Area 8 encompassed several fields which were all under mature cereal crop at the time of the survey and could not be accessed (**Plates 4** and **5**).

*Area 9*

4.2.3. The majority of Area 9 lies within pastoral fields that were under tall grass for hay-making at the time of the survey, limiting visibility to the central fields which had recently been cut (**Plates 6-9**). Two mounded areas (**Assets 125** and **126**) observed in Area 9 were related to modern field drain installation per the landowner's comments on Site. The landowner related that the central portion of Area 9, namely the fields to the immediate east and west of the track leading to the farm, suffer from drainage issues and that extensive works have been carried out to install various field drains here. He has observed older rubble drains and ceramic drains during these works, indicating that the problem is a long-standing one. The Achonnie Burn runs through this area and the drains likely lead thus.

4.2.4. No upstanding remains related to the building (**Asset 46**) depicted on the 1873 OS map were visible, and the landowner confirmed that neither this or the building at **Asset 47**, also depicted on the 1873 OS map but outwith the Site, were visible as upstanding remains.

*Area 15*

4.2.5. The west-most extents of Area 15 were not visited or viewed as the crop fields to the south and east through which access would have been made were being sprayed with fertiliser at the time of the survey. This prohibited viewing of the kerb cairn **Asset 95**, which while not situated within the Site itself is closely adjacent to it.

4.2.6. The central west area of Area 15 comprised fields under mature cereal crop. The east area includes fields where rig and furrow (**Asset 97**) had been previously recorded and are visible on aerial imagery dating to 2021 on Google Eath Pro. These fields appear to have been ploughed fairly recently, perhaps in the last two years, and no discernible rig and furrow is now visible on the ground (**Plate 10**).

4.2.7. The east-most portion of Area 15 is within a rough pasture field and no upstanding remains were observed during

the walkover survey (**Plate 11**).

*Area 16*

4.2.8. Area 16 was viewed from the roadside over fields of mature cereal crop. It was seen to comprise areas of long grass likely for hay-making and rough pasture, situated on the banks of the North Ugie Water (**Plate 12**). No upstanding remains could be discerned.

*Area 17*

4.2.9. Area 17 was viewed from the road side and comprised pastoral fields with grazing cattle (**Plate 13**). No visible upstanding remains could be discerned, however the west-most extent of this Area was not directly visible.

*Area 18*

4.2.10. Area 18 comprised a field of recently mown hay and was viewed from the east extent. The dis-used Ugie canal (**Asset 103**) crosses Area 18 but could not be viewed due to the tall reeds surrounding it (**Plate 14**). No other upstanding remains were viewed in Area 18.

*Area 19*

4.2.11. Area 19 straddles the A90 road. The west extent comprised a field under tall grass likely for hay-making and was viewed from the A90 itself. A small prominent hillock was visible, in which the since destroyed souterrain (**Asset 116**) was located (**Plate 14**). While no structural remains are now evident beside a modern agricultural tank atop the hill it is possible that further Iron Age settlement remains related to the souterrain could be present at a sub-surface level in the immediate vicinity.

4.2.12. The east extent of Area 19 was observed from the A90 and comprised fields of mature cereal crop and as such could not be accessed directly (**Plate 15**).

## 5. CONCLUSION AND MITIATION RECOMMENDATIONS

5.1.1. The survey has confirmed that the Site generally covers land in agricultural use and that the majority of heritage assets recorded within the Site boundary itself have been demolished and are no longer visible in any upstanding form. Arboreal elements of two non-designated designed landscapes **Assets 35** and **89** were visible as mature beech trees forming avenues or stands of trees alongside roads. The dis-used Ugie canal (**Asset 103**), though not directly observed, likely survives within Area 18 but perhaps as a silted up watercourse which now facilitates reed growth.

5.1.2. Three new assets were identified during the walkover survey, comprising features that are likely related to drainage activities. The linear ditch **Asset 127** located in Area 2 may represent an older cut drainage ditch, now under grass, while the two drainage features **Assets 125** and **126** in **Area 8** were confirmed by the landowner to be modern, with further knowledge of additional drainage features in the local area also confirmed by the landowner.

5.1.3. The survey areas available for access and direct viewing were limited by the presence of mature crop, grass and the presence of livestock, however it appears that very little of the Site would be likely to contain upstanding remains that have not been previously recorded. Many of the assets recorded within the Site itself have evidently been cleared to increase the arable area of the surrounding fields and this pattern likely has extended across the entirety of the Site.

5.1.4. Potential impacts on known or unknown buried archaeological remains which may survive within the Site relate to the possibility of disturbing, removing or destroying *in situ* remains and artefacts during ground-breaking works (including excavation, construction and other works) associated with the Proposed Development. While little was observed during the walkover survey in terms of upstanding remains, this does not preclude the presence of sub-surface remains. Traditionally pastoral fields may not have been as impacted upon by the plough as those tilled for crop, and it is considered that Area 19 with its previously recorded souterrain (**Asset 116**), situated in a pastoral field, could have a High potential for additional prehistoric remains related to this structure to be present in its surrounds.

5.1.5. Mitigation proposals will be set out within the client's Cultural Heritage assessment in regards to the potential impacts upon heritage assets, both known and unknown, in order to avoid, minimise or offset any such impacts by the Proposed Development as appropriate. Given the nature of the landuse across the Site and the results of LiDAR analysis, aerial photograph analysis, map regression and walkover survey, it is not considered that further walkover survey would provide further information. As such, mitigation is likely to take the form of intrusive works, such as trial trenching or archaeological monitoring via a watching brief, over a proportion of the Site to allow for a further mitigation strategy to be developed. This would likely require to be focused on areas of archaeological potential, such as Area 19 as discussed above. The scope of any such works would be required to be agreed via a Written Scheme of Investigation with ACAS, as advisors to Aberdeenshire Council on such matters.

# 6. REFERENCES

## 6.1. Bibliographic References

Chartered Institute for Archaeologists (CIfA). 2014, updated 2020. *Standard and guidance for commissioning work or providing consultancy advice on the historic environment.* [Online] Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GCommissioning_2.pdf [Accessed: 23/06/2023]

CIfA. 2019, updated 2022. *Code of Conduct: Professional Ethics in Archaeology*. [Online] Available at: https://www.archaeologists.net/sites/default/files/CodesofConduct.pdf [Accessed: 23/06/2023]

CIfA. 2019, updated 2021. *Regulations for professional conduct.* [Online] Available at: https://www.archaeologists.net/sites/default/files/Regulations%20for%20professional%20conduct.pdf [Accessed: 23/06/2023]

CIfA. 2014, updated 2020. *Standard and guidance for historic environment desk-based assessment.* [Online] Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf [Accessed: 23/06/2023]

## 6.2. Cartographic References

The following maps were consulted through National Library of Scotland Website (http://maps.nls.uk):

Ordnance Survey. 1872. *Aberdeenshire, Sheet XV*, Surveyed: 1869, Published: 1872

Ordnance Survey. 1872. *Aberdeenshire, Sheet XXII,* Surveyed: 1869-70, Published: 1872

Ordnance Survey. 1873. *Aberdeenshire, Sheet XXI*, Surveyed: 1870, Published: 1873

Ordnance Survey. 1874. *Aberdeenshire, Sheet XX*, Surveyed: 1870, Published: 1874

# Green Volt Cable Route, Aberdeenshire: Archaeological Walkover Survey Report

## Appendix 1: Asset/Event Gazetteer

# Green Volt Cable Route, Aberdeenshire: Archaeological Walkover Survey Report

## Appendix 2: Plates

Plate 1: View southeast over Area 4, showing typical Site conditions of varied pastoral and crop fields

Plate 2: View southwest over west extent of Area 2, depressed linear feature **Asset 126** visible in foreground

Plate 3: View northeast over east extent of Area 2, under mature crop

Plate 4: View north over central part of Area 8 over mature crop

Plate 5: View northwest over Area 8 from east extent through mature crop

Plate 6: View west over west extent of Area 9

Plate 7: Modern mound over modern field drain location (**Asset 125**) in Area 9, per landowner's comments, facing west

Plate 8: Modern field drain (**Asset 126**) open excavation area in Area 9 per landowner's comments, facing northwest

Plate 9: View east over east extent of Area 9, under long pasture

Plate 10: View northeast over central portion of Area 15 where rig and furrow **Asset 97** had previously been recorded, now seemingly ploughed flat

Plate 11: View southwest over east portion of Area 15

Plate 12: View east-northeast over Area 16 from west extent

Plate 13: View northwest over Area 17 from east extent, pastoral field, no upstanding remains visible from fence line

Plate 14: View west over Area 18 from east extent, Ugie Canal (**Asset 103**) lies in foreground but direct views obstructed by tall reeds

Plate 15: View west-northwest over Area 19 on west side of A90 – hillock in centre of frame is where souterrain **Asset 116** was located

Plate 16: View southeast over Area 19 on east side of A90 – Site runs along crest of hill, under crop

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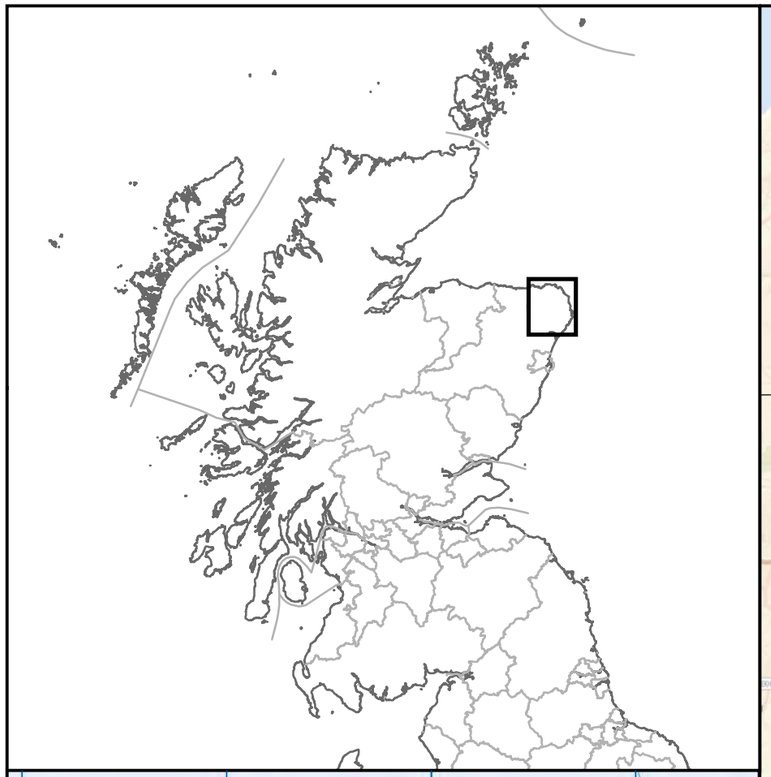
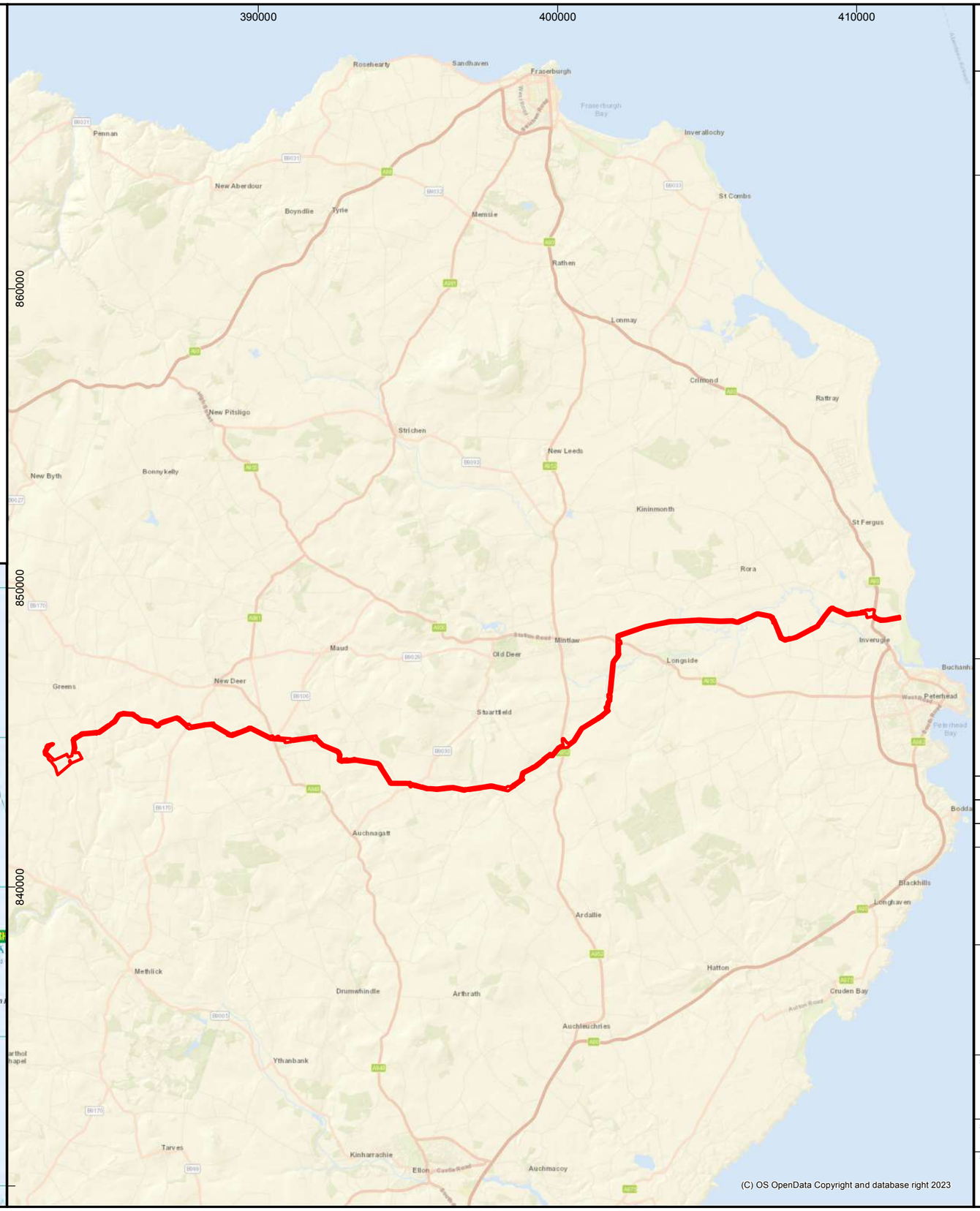



| Figure | 1 |
|---|---|

Site Location

**Legend**

Site Boundary

FOR

Green Cat Renewables Ltd

| | |
|---|---|
| **Drawn/checked:** | SW/SO |
| **DWG no:** | 01/27057/WOS/01/01 |
| **AOC Project No.:** | 27057 |



SYSTEM

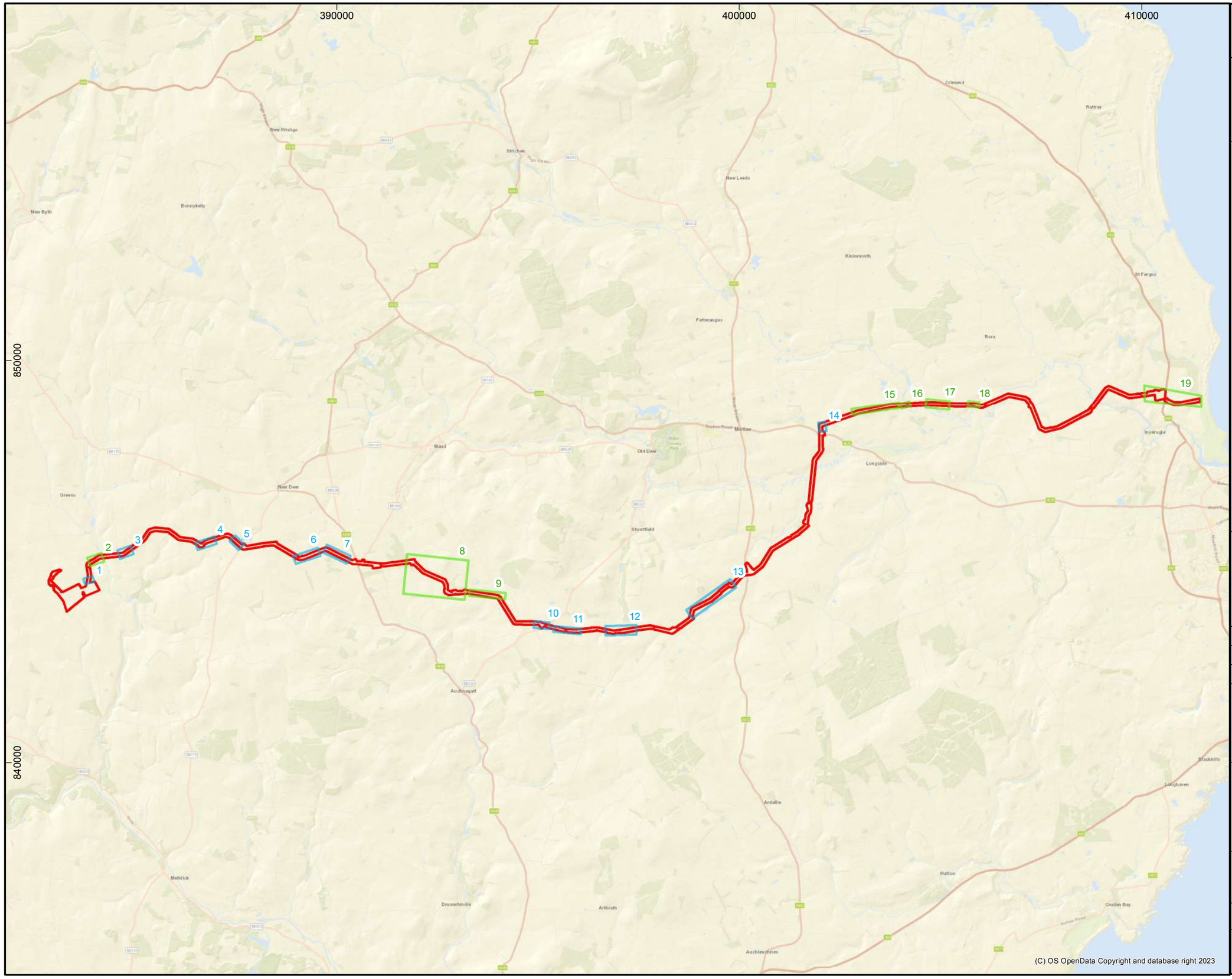
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:150,000 @ A3

SCALE

0 5km




| Figure | 2 |
|---|---|

Areas Proposed for Rapid Assessment and Walkover Survey

**Legend**

- Site Boundary
- Rapid Assessment Area
- Walkover Survey Area

FOR

Green Cat Renewables Ltd

| | |
|---|---|
| **Drawn/checked:** | SW/SO |
| **DWG no:** | 01/27057/WS/02/01 |
| **AOC Project No.:** | 27057 |



SYSTEM

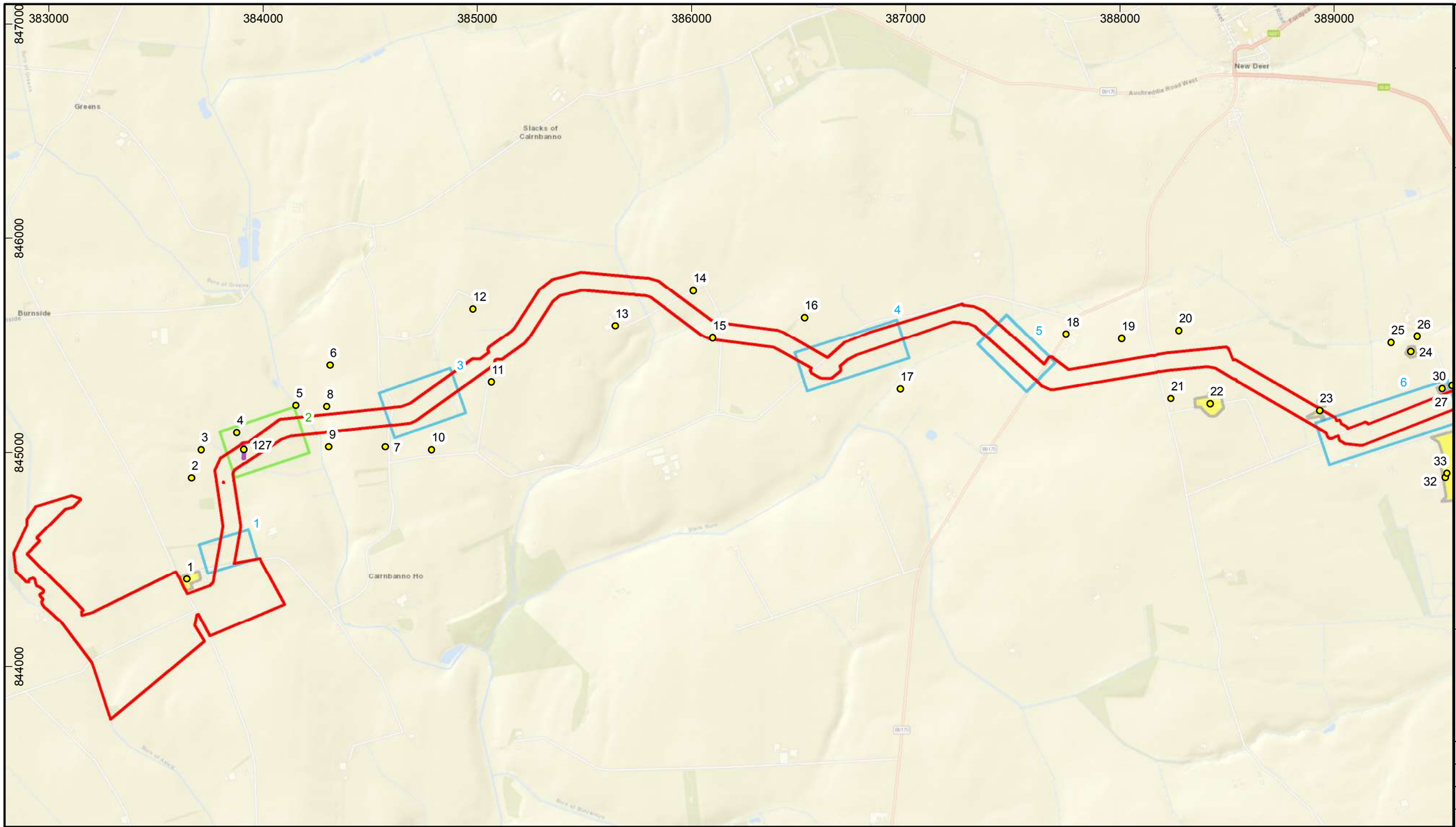
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

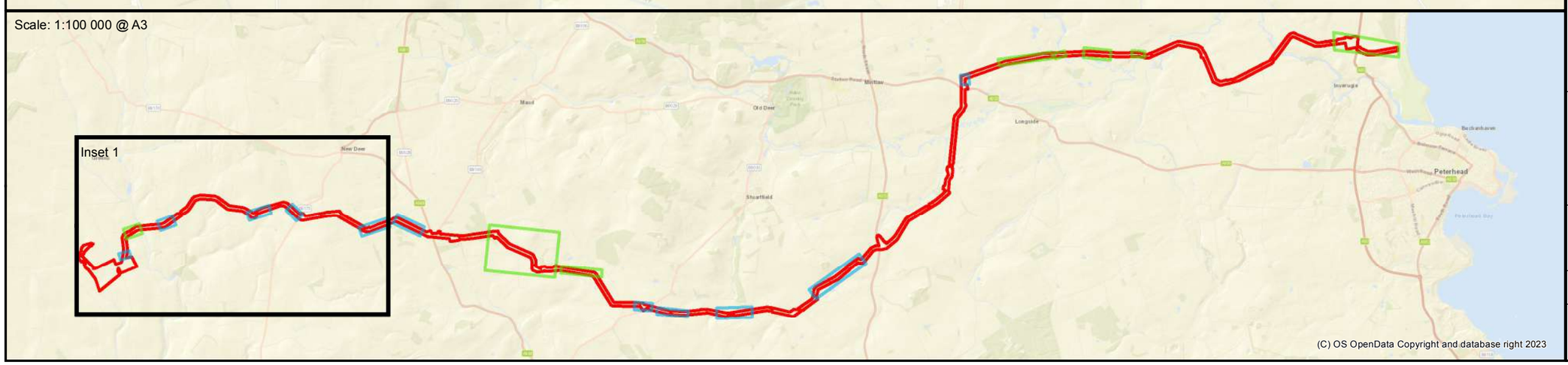
SCALE

1:90,000 @ A3

SCALE

0 4km




| Figure | 3 |
|---|---|

Proposed Development Corridor and Survey Area Overview
Inset 1

**Legend**

- Site Boundary
- Rapid Assessment Area
- Walkover Survey Area
- Listed Building- Category B
- Listed Building- Catgeory C
- Non-designated Heritage Asset
- Event
- HER Asset Extent
- Walkover Survey Asset Extent

FOR

Green Cat Renewables Ltd

| | |
|---|---|
| **Drawn/checked:** | SW/SO |
| **DWG no:** | 01/27057/WS/03/01 |
| **AOC Project No.:** | 27057 |

AOC Archaeology Group



N

SYSTEM

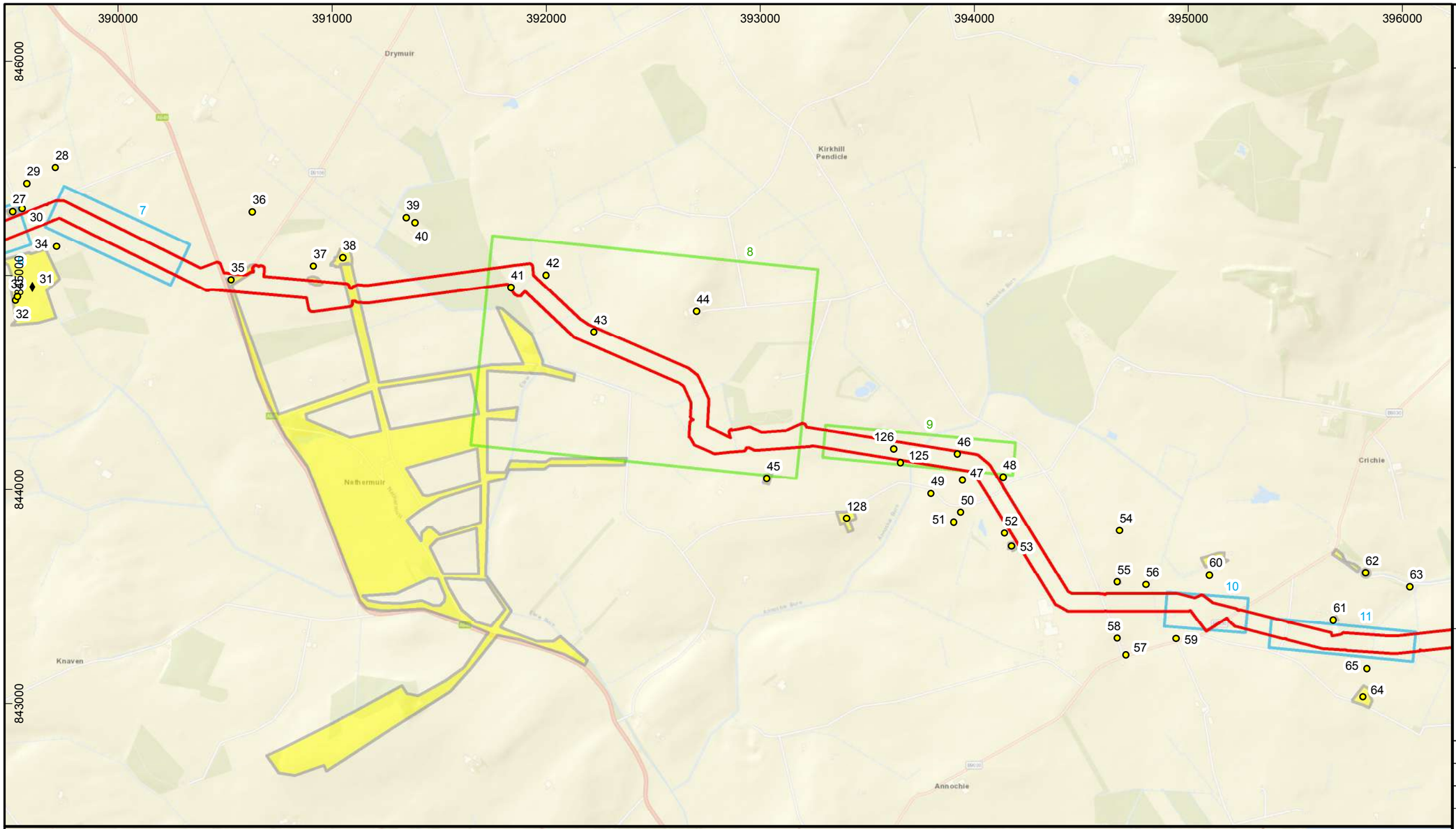
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

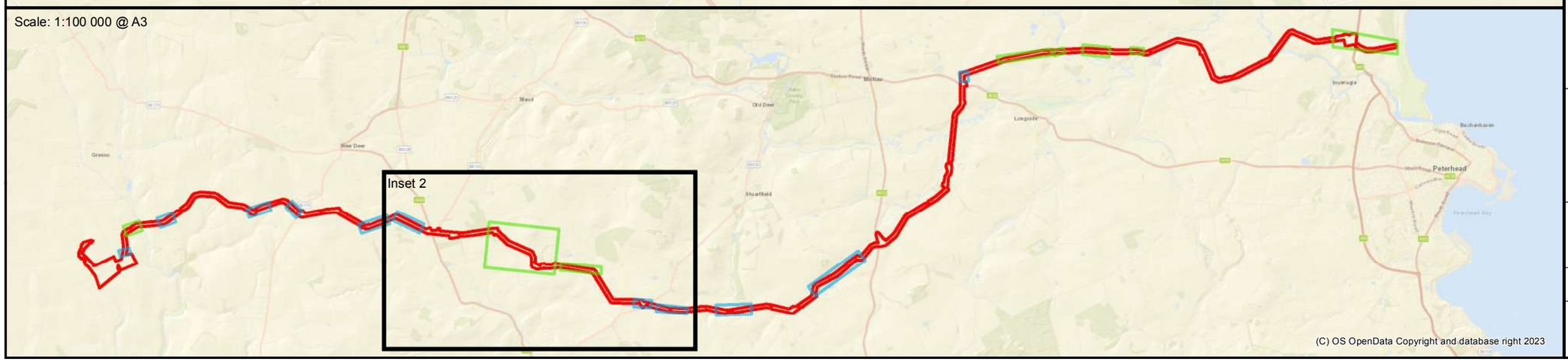
SCALE

1:20,000 @ A3

SCALE

0 1km




| Figure | 4 |
|---|---|

Proposed Development Corridor and Survey Area Overview
Inset 2

**Legend**

- Site Boundary
- Rapid Assessment Area
- Walkover Survey Area
- Listed Building- Category B
- Listed Building- Catgeory C
- Non-designated Heritage Asset
- Event
- HER Asset Extent
- Walkover Survey Asset Extent

FOR

Green Cat Renewables Ltd

| | |
|---|---|
| **Drawn/checked:** | SW/SO |
| **DWG no:** | 01/27057/WS/04/01 |
| **AOC Project No.:** | 27057 |

AOC Archaeology Group



N

SYSTEM

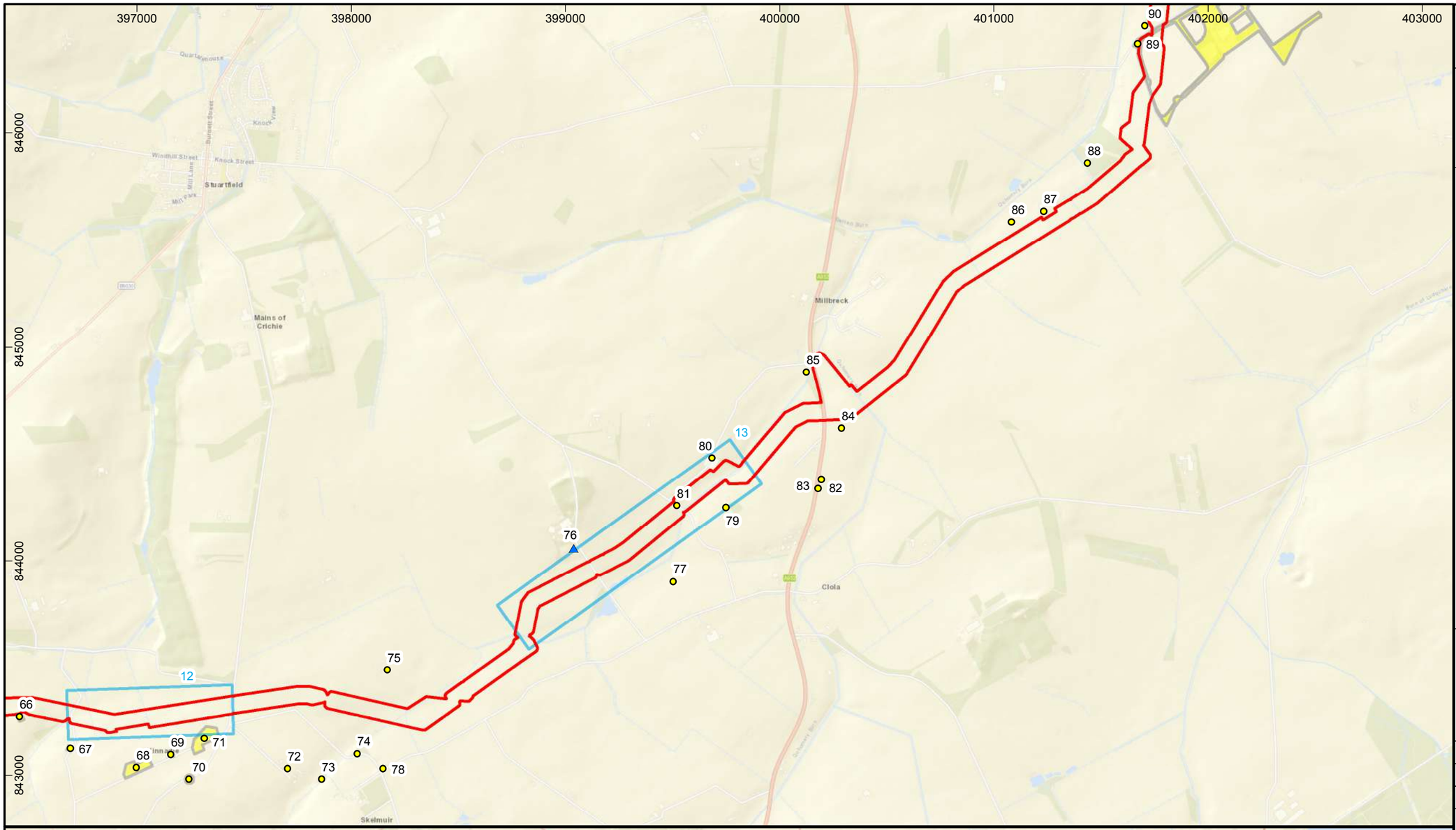
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

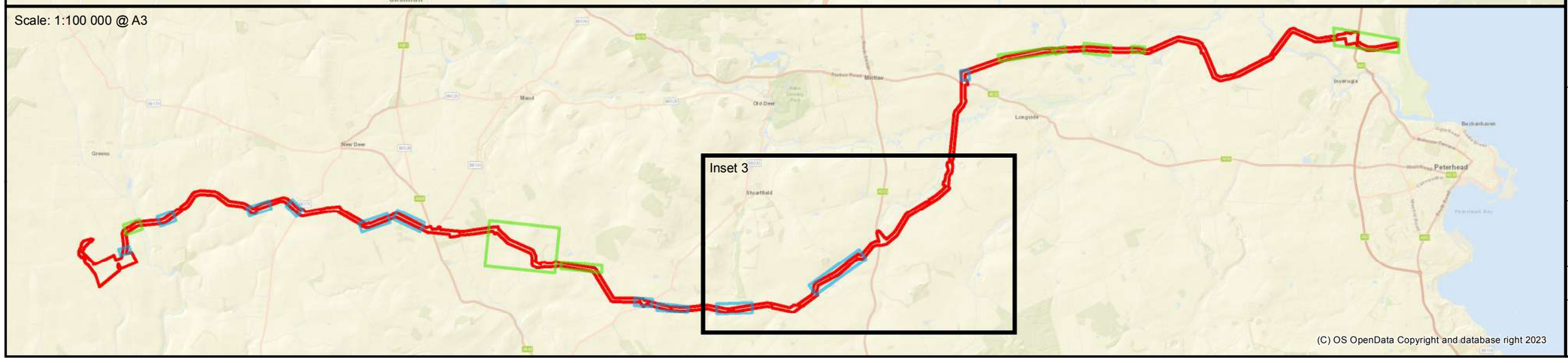
SCALE

1:20,000 @ A3

SCALE

0 1km




| Figure | 5 |
|---|---|

Proposed Development Corridor and Survey Area Overview
Inset 3

**Legend**

- Site Boundary
- Rapid Assessment Area
- Walkover Survey Area
- Listed Building- Category B
- Listed Building- Catgeory C
- Non-designated Heritage Asset
- Event
- HER Asset Extent
- Walkover Survey Asset Extent

FOR

Green Cat Renewables Ltd

| | |
|---|---|
| **Drawn/checked:** | SW/SO |
| **DWG no:** | 01/27057/WS/05/01 |
| **AOC Project No.:** | 27057 |

AOC Archaeology Group



N

SYSTEM

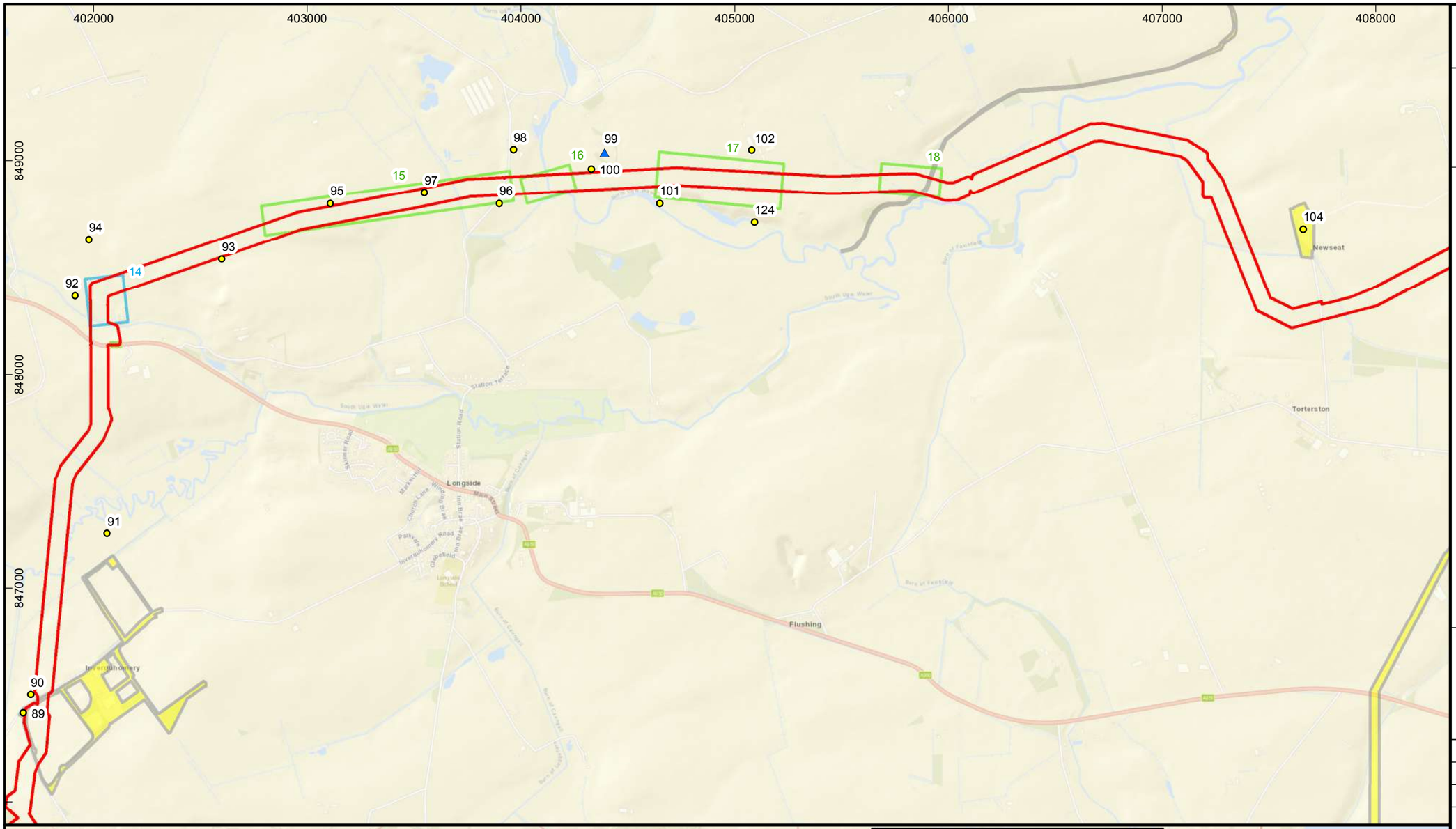
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

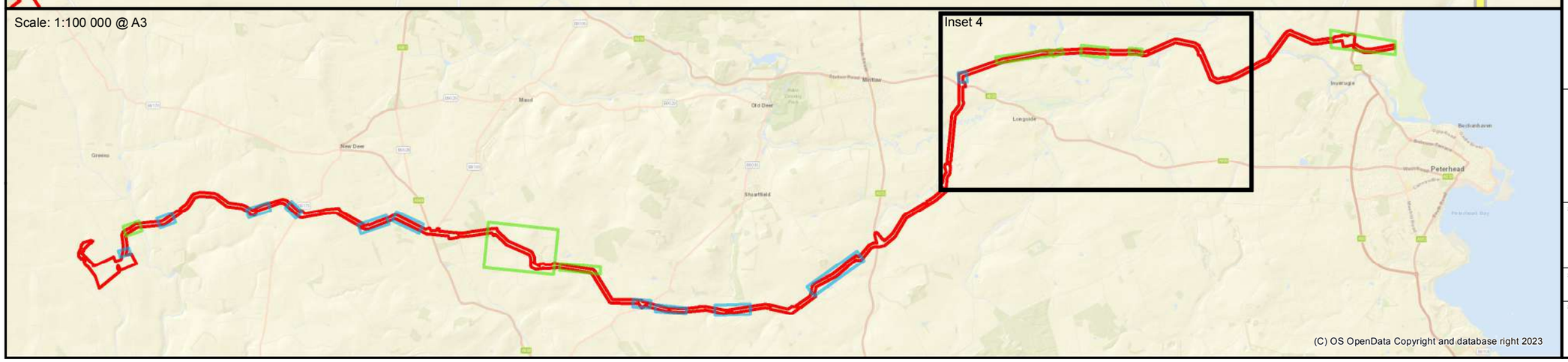
SCALE

1:20,000 @ A3

SCALE

0 1 km




| Figure | 6 |
|---|---|

Proposed Development Corridor and Survey Area Overview
Inset 4

**Legend**

- Site Boundary
- Rapid Assessment Area
- Walkover Survey Area
- Listed Building- Category B
- Listed Building- Catgeory C
- Non-designated Heritage Asset
- Event
- HER Asset Extent
- Walkover Survey Asset Extent

FOR

Green Cat Renewables Ltd

| | |
|---|---|
| **Drawn/checked:** | SW/SO |
| **DWG no:** | 01/27057/WS/06/01 |
| **AOC Project No.:** | 27057 |

AOC Archaeology Group



SYSTEM

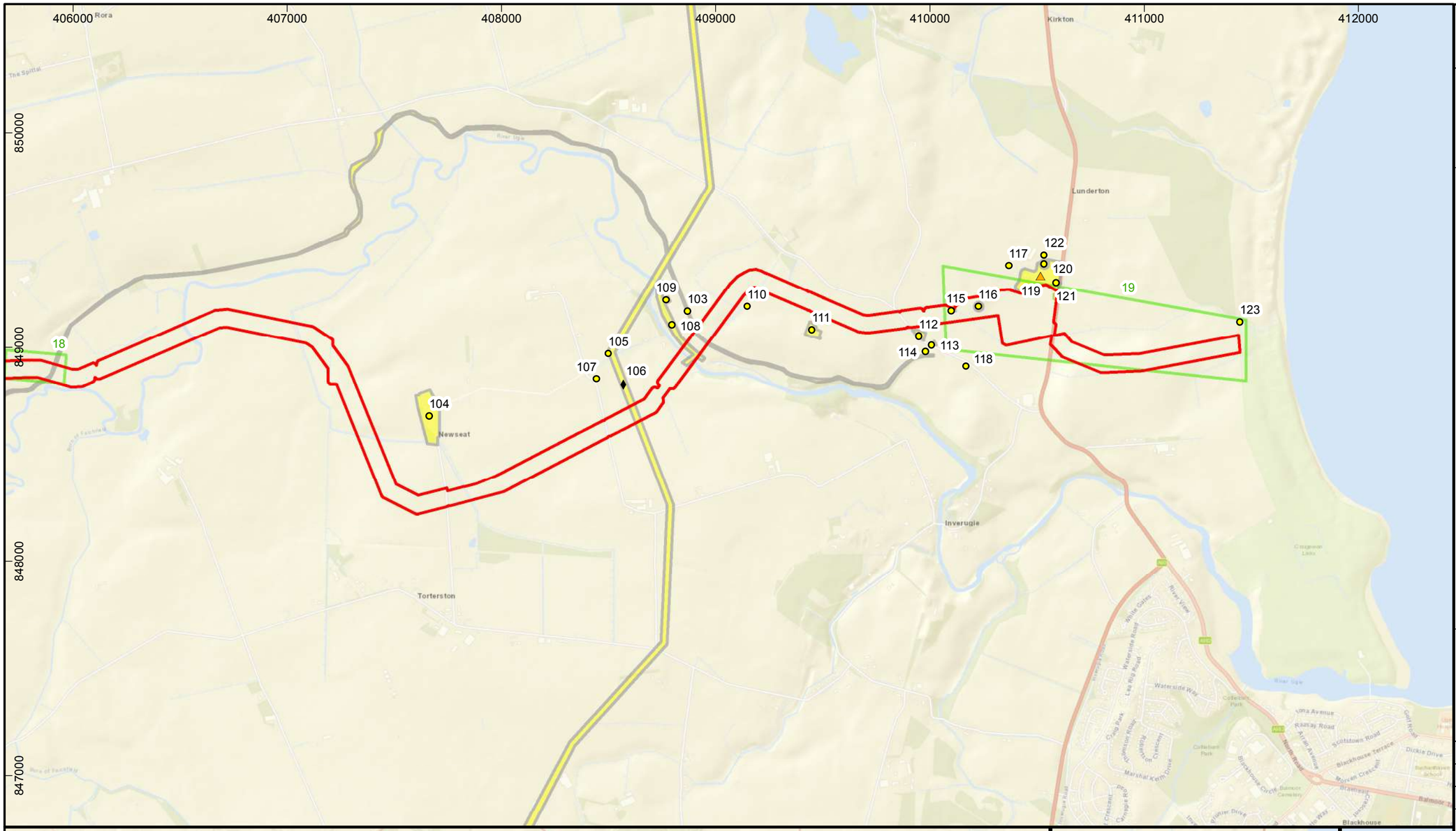
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

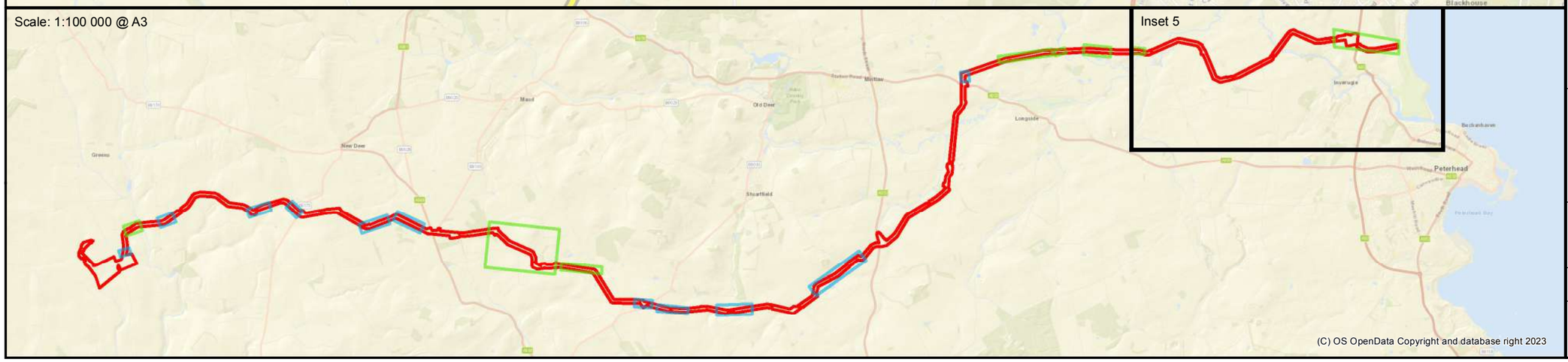
SCALE

1:20,000 @ A3

SCALE

0 1km




| Figure | 7 |
|---|---|

Proposed Development Corridor and Survey Area Overview
Inset 5

**Legend**

- Site Boundary
- Rapid Assessment Area
- Walkover Survey Area
- Listed Building- Category B
- Listed Building- Catgeory C
- Non-designated Heritage Asset
- Event
- HER Asset Extent
- Walkover Survey Asset Extent

FOR

Green Cat Renewables Ltd

| | |
|---|---|
| **Drawn/checked:** | SW/SO |
| **DWG no:** | 01/27057/WS/07/01 |
| **AOC Project No.:** | 27057 |

AOC Archaeology Group



SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:20,000 @ A3

SCALE

0 1 km

# Gazetteer of Heritage Assets and Event

| | |
|---|---|
| **Asset/Event Number** | 1 |
| **Asset/Event Name** | UPPER MAINS OF ASLEID |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ84SW0089 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 383645 |
| **Northing** | 844408 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 2 |
| **Asset/Event Name** | North Mians of Aslead |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ84SW0081 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 383667 |
| **Northing** | 844880 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 3 |
| **Asset/Event Name** | Well |
| **Type of Asset/Event** | Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 383713 |
| **Northing** | 845011 |
| **Parish** | |
| **Council** | Aberdeenshire |

| | |
|---|---|
| **Description** | Well annotated on historic map.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 4 |
| **Asset/Event Name** | T. Mill and Sluice |
| **Type of Asset/Event** | T. Mill and Sluice |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ84NW0075 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 383878 |
| **Northing** | 845092 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Mill annotated on historic map<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 5 |
| **Asset/Event Name** | Volunteer Rifle Range |
| **Type of Asset/Event** | Volunteer Rifle Range |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 384154 |
| **Northing** | 845218 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Volunteer Rifle Range annotated on historic map<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 6 |
| **Asset/Event Name** | Woodehead |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 384314 |

| | |
|---|---|
| **Northing** | 845407 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 7 |
| **Asset/Event Name** | Smiddyhill and Smithy |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 384572 |
| **Northing** | 845026 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead and smithy depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 8 |
| **Asset/Event Name** | Well |
| **Type of Asset/Event** | Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 384298 |
| **Northing** | 845214 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Well annotated on historic map<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 9 |
| **Asset/Event Name** | Marker's Butt Target |
| **Type of Asset/Event** | Target |
| **Listing No./NRHE Number** | |

| | |
|---|---|
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 384308 |
| **Northing** | 845025 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Target annotated on historic map |
| | *Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 10 |
| **Asset/Event Name** | Mosside and Well |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 384788 |
| **Northing** | 845012 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps. |
| | *Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 11 |
| **Asset/Event Name** | Highness and Well |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 385067 |
| **Northing** | 845328 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps. |
| | *Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 12 |

| | |
|---|---|
| **Asset/Event Name** | Burnthill and Well |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 384982 |
| **Northing** | 845669 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 13 |
| **Asset/Event Name** | Earnhill and Well |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 385646 |
| **Northing** | 845590 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 14 |
| **Asset/Event Name** | Peeledegg and T Mill |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 386010 |
| **Northing** | 845755 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

| | |
|---|---|
| **Asset/Event Number** | 15 |
| **Asset/Event Name** | Building |
| **Type of Asset/Event** | Building |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 386101 |
| **Northing** | 845535 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Building depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

| | |
|---|---|
| **Asset/Event Number** | 16 |
| **Asset/Event Name** | Boglea and Well |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 386530 |
| **Northing** | 845628 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

| | |
|---|---|
| **Asset/Event Number** | 17 |
| **Asset/Event Name** | Two buildings |
| **Type of Asset/Event** | Buildings |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 386977 |
| **Northing** | 845296 |
| **Parish** | |

| | |
|---|---|
| **Council** | Aberdeenshire |
| **Description** | Buildings depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 18 |
| **Asset/Event Name** | Myre of Bedlam |
| **Type of Asset/Event** | Township |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 387750 |
| **Northing** | 845550 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Township with T Mill and at least seven buildings depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 19 |
| **Asset/Event Name** | Farmsetad and Well |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 388009 |
| **Northing** | 845531 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Unlabelled farmstead depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 20 |
| **Asset/Event Name** | Farmstead |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |

| | |
|---|---|
| **Easting** | 388278 |
| **Northing** | 845568 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Unlabelled farmstead depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 21 |
| **Asset/Event Name** | Auchmaliddie Cottages |
| **Type of Asset/Event** | Cottage(S) (Period Unassigned) |
| **Listing No./NRHE Number** | NJ84NE 39.01 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 388240 |
| **Northing** | 845250 |
| **Parish** | New Deer |
| **Council** | Aberdeenshire |
| **Description** | No information recorded- https://canmore.org.uk/site/186481/auchmaliddie-cottages |

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| | |
|---|---|
| **Asset/Event Number** | 22 |
| **Asset/Event Name** | NORTH MAINS OF AUCHMALIDDIE |
| **Type of Asset/Event** | FARMSTEADS |
| **Listing No./NRHE Number** | NJ84NE39 |
| **HER Number** | NJ84NE0118 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 388423 |
| **Northing** | 845227 |
| **Parish** | New Deer |
| **Council** | Aberdeenshire |
| **Description** | No further information recorded - https://online.aberdeenshire.gov.uk/smrpub/master/detail.aspx?tab=main&refno=NJ84NE0118 / https://canmore.org.uk/site/186479/north-mains-of-auchmaliddie<br><br>Farmstead, smithy and well depicted on historic OS maps.<br><br>*Aberdeenshire, Sheet XX Survey date: 1870, Publication date: 1874 |

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| | |
|---|---|
| **Asset/Event Number** | 23 |

| | |
|---|---|
| **Asset/Event Name** | MITCHELLHILL COTTAGE |
| **Type of Asset/Event** | Destoryed Cottage |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ84NE0060 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 388935 |
| **Northing** | 845195 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Site of a now destroyed mill that is depicted on the 1867 1st edition OS map. It shows a rectangular threshing mill with a L-shaped range of buildings to the north and a probable mill dam in between. A well is also recorded<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 24 |
| **Asset/Event Name** | EASTER AUCHMALIDDIE |
| **Type of Asset/Event** | Standing Structure |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ84NE0082 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 389360 |
| **Northing** | 845470 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead, still in use, depicted on the 1st edition OS map of 1867 as two rectangular steadings set at right angles, with a small unroofed building to the north. On the 2nd edition the two buildings have been joined creating an L-shaped steading open to the southwest, and a small farmhouse has been added to the west. The original buildings appear to survive, with another building added to the north.<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 25 |
| **Asset/Event Name** | Well |
| **Type of Asset/Event** | Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 389268 |
| **Northing** | 845513 |

| | |
|---|---|
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Well annotated on historic map<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 26 |
| **Asset/Event Name** | Well |
| **Type of Asset/Event** | Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 389391 |
| **Northing** | 845541 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Well annotated on historic map<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 27 |
| **Asset/Event Name** | AUCHMALIDDIE |
| **Type of Asset/Event** | Destroyed |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ84NE0081 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 389507 |
| **Northing** | 845298 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Site of a cottage with enclosed garden area to the north and west depicted on the 1st and 2nd edition OS maps, but not on the current edition (2006).<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 28 |
| **Asset/Event Name** | Two buildings and a Well |
| **Type of Asset/Event** | Buildings |
| **Listing No./NRHE Number** | |

| | |
|---|---|
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 389707 |
| **Northing** | 845503 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Two rectangular buildings and a well depicted on a historic map<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 29 |
| **Asset/Event Name** | Building and Well |
| **Type of Asset/Event** | Building |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 389574 |
| **Northing** | 845428 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | An L-shaped building and well depicted as Clockhill<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 30 |
| **Asset/Event Name** | Building |
| **Type of Asset/Event** | Building |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 389552 |
| **Northing** | 845311 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A building on the eastern side of a N-S aligned road to the east of a Cottage (Asset 27) associated with a well and loctaed wihtin a rectangular plot of land<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 31 |
| **Asset/Event Name** | AUCHMALIDDIE |
| **Type of Asset/Event** | Event |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Event |
| **Easting** | 389599 |
| **Northing** | 844948 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Environmental investigation of Auchmaliddie to assess its archaeological potential, was carried out by AOC in 1998-9 as part of an archaeological assessment of Scottish wetlands. Wooden clubs (NJ84SE0003) and two Late Bronze Age shields (NJ84SE0002) were recovered from the moss in the late 19th century. Site visit January 1999 noted that the site was then saturated. The presence of grass indicates that the moss surface has been improved in the past. No material of archaeological significance was observed during the walkover or from core samples. Extensive peat cutting in the past has affected the level of the site and suggests limited palaeoenvironmental potential. |

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| | |
|---|---|
| **Asset/Event Number** | 32 |
| **Asset/Event Name** | AUCHMALEDDIE |
| **Type of Asset/Event** | Artefact- Shield (Bronze) |
| **Listing No./NRHE Number** | NJ84SE2 |
| **HER Number** | NJ84SE0002 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 389521 |
| **Northing** | 844883 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Two Late Bronze Age shields, one of Yetholm and the other of Coveney-type. In May 1897 Mr George Littlejohn, the son of the farmer of Mitchelhill Farm, New Deer, was casting peats in the Moss of Auchmaleddie. During the course of the work he found two shields, one lying on top of the other, embedded in the peat. The findspot has been described as being near the central part of a circular cup-shaped hollow of about 450 yards in diameter in a peat moss, circa 4 feet below the surface and 5 feet above the blue clay subsoil at the base of the peat. Previously circa 5 feet of peat had already been removed from the hollow. The Coveney-type shield is 45 cm in diameter, made of sheet bronze, including the handle, and is decorated with a central boss around which four separate meandering ribs set between two concentric ribs. The shield is one of only two of this type from Britain. The other shield, which lay on top of the Coveney-type shield, is of the Yetholm-type, and is again made from bronze but this time with a diameter of 70 cm with a central boss, and is decorated with 25 concentric rows of small bosses alternating with 25 concentric ribs. |

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|---|---|
| **Asset/Event Number** | 33 |

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|---|---|
| **Asset/Event Name** | AUCHMALEDDIE |
| **Type of Asset/Event** | Artefact- Implement(S) (Wood) |
| **Listing No./NRHE Number** | NJ84SE3 |
| **HER Number** | NJ84SE0003 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 389530 |
| **Northing** | 844902 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A number of wooden clubs found in a peat moss during drainage work in 1896. No further information as to their present location. |

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| | |
|---|---|
| **Asset/Event Number** | 34 |
| **Asset/Event Name** | Building and Well |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 389712 |
| **Northing** | 845136 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A U-shaped building opening to the SE and associated with gardens on the W side and a well depicted on a historic map<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 35 |
| **Asset/Event Name** | NETHERMUIR HOUSE |
| **Type of Asset/Event** | House (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SW24 |
| **HER Number** | NJ94SW0094 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 390529 |
| **Northing** | 844978 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Remains of a designed landscape which may date to the 18th century. |

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|---|---|
| **Asset/Event Number** | 36 |
| **Asset/Event Name** | Little Drum |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 390628 |
| **Northing** | 845297 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Two rectangular buildings associated with a garden area and pond depicted on a historic map<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 37 |
| **Asset/Event Name** | BADNYRIEVES |
| **Type of Asset/Event** | Crop Mark (Includes Soil Mark) |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ94SW0070 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 390914 |
| **Northing** | 845042 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Cropmarks of two quarries which are depicted on the 1st edition OS map but not on the 2nd edition one. Still visible on the aerial photograph. |

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|---|---|
| **Asset/Event Number** | 38 |
| **Asset/Event Name** | BADNYRIEVES |
| **Type of Asset/Event** | Standing Structure |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ94NW0094 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 391050 |
| **Northing** | 845083 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead still in use, depicted on the 1st edition OS map. The map shows a L-shaped building with an adjoining V-shaped building that creates a small enclosed triangular courtyard. Just to |

the north of these buildings lies a sub-rectangular enclosure. By the time of the 2nd edition map the L-shaped building had been extended, the V-shaped building has been demolished and two rectangular buildings have been built. The range has since been further enlarged.

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| | |
|---|---|
| **Asset/Event Number** | 39 |
| **Asset/Event Name** | T Mill |
| **Type of Asset/Event** | Mill |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 391347 |
| **Northing** | 845270 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A threshing mill annotated on a historic map |
| | * Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 40 |
| **Asset/Event Name** | Capelstones |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 391387 |
| **Northing** | 845245 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps. |
| | * Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 41 |
| **Asset/Event Name** | Great North of Scotland Railway - Formtartine and Buchan Section |
| **Type of Asset/Event** | Railway |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 391837 |

| | |
|---|---|
| **Northing** | 844942 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Centre point of a raillway<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 42 |
| **Asset/Event Name** | Bulwark Moss |
| **Type of Asset/Event** | Stone Ball(S) (Stone) |
| **Listing No./NRHE Number** | NJ94NW 37 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 392000 |
| **Northing** | 845000 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | NJ94NW 37 92 45<br><br>'Two stone balls, 3 1/2 and 2 1/2 inches in diameter, from Moss of Bulwark, Old Deer' are in Royal Museum of Scotland (RMS, AS 125 and AS 126).<br><br>Proc Soc Antiq Scot 1898. |

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| | |
|---|---|
| **Asset/Event Number** | 43 |
| **Asset/Event Name** | Moss-side |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 392224 |
| **Northing** | 844735 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A farmstead depicted on a historic map- an L-shaped building and a rectangular structure<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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|---|---|
| **Asset/Event Number** | 44 |
| **Asset/Event Name** | Little Elrick |

| | |
|---|---|
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 392703 |
| **Northing** | 844833 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Four rectangular buildings, forming a courtyard farmstead associated with ancillary buildings and garden areas<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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|---|---|
| **Asset/Event Number** | 45 |
| **Asset/Event Name** | NORTH KIDDSHILL |
| **Type of Asset/Event** | Destroyed farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ94SW0049 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 393033 |
| **Northing** | 844050 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Site of a now destroyed farmstead that is depicted on the 1867 1st edition OS map. It shows a L-shaped building, and a small rectangular building that was probably the house and a garden with a well at the east end of it. The smaller building and one wong of the range had been removed by the time of the 1888 OS 2nd edition map which shows only a single rectangular building and the well. |

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| | |
|---|---|
| **Asset/Event Number** | 46 |
| **Asset/Event Name** | Building |
| **Type of Asset/Event** | Building |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 393923 |
| **Northing** | 844165 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A rectangular building depicted on a historic map |

* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873

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| | |
|---|---|
| **Asset/Event Number** | 47 |
| **Asset/Event Name** | Well |
| **Type of Asset/Event** | Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 393947 |
| **Northing** | 844043 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A well annotated on a historic map |
| | * Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 48 |
| **Asset/Event Name** | Well |
| **Type of Asset/Event** | Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 394137 |
| **Northing** | 844057 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A well annotated on a historic map |
| | * Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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|---|---|
| **Asset/Event Number** | 49 |
| **Asset/Event Name** | Two buildings |
| **Type of Asset/Event** | Building |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 393799 |
| **Northing** | 843981 |

| | |
|---|---|
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Two buildings in a T-shape depicted on a historic map<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 50 |
| **Asset/Event Name** | Two buildings |
| **Type of Asset/Event** | Building |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 393938 |
| **Northing** | 843893 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Two parallel buildings depicted on a historic map<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 51 |
| **Asset/Event Name** | Three Buildings |
| **Type of Asset/Event** | Buildings |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 393907 |
| **Northing** | 843846 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Three buildings depicted in a courtyard shape associated with a well<br><br>*Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 52 |
| **Asset/Event Name** | Well |
| **Type of Asset/Event** | Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |

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|---|---|
| **Status** | Non-designated Heritage Asset |
| **Easting** | 394144 |
| **Northing** | 843795 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A well annotated on a historic map<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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|---|---|
| **Asset/Event Number** | 53 |
| **Asset/Event Name** | CLOCHCAN |
| **Type of Asset/Event** | Destroyed farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ94SW0053 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 394176 |
| **Northing** | 843735 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Site of a now destroyed farmstead that is depicted on the OS 1st edition map. It show three rectangular buildings with a well to the northwest. Only one building remained at the time of the OS 2nd edition map. Three wells annotated |

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| | |
|---|---|
| **Asset/Event Number** | 54 |
| **Asset/Event Name** | Longleigh |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 394680 |
| **Northing** | 843808 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A courtyard farmstead, open to the NE associated with a well<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 55 |
| **Asset/Event Name** | CLOCHCAN |

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|---|---|
| **Type of Asset/Event** | Destroyed cottage |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ94SW0054 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 394670 |
| **Northing** | 843568 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Site of a now destroyed rectangular cottage that is depicted on the 1867 1st edition OS map but not on the 1888 2nd edition. |

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| | |
|---|---|
| **Asset/Event Number** | 56 |
| **Asset/Event Name** | Well |
| **Type of Asset/Event** | Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 394804 |
| **Northing** | 843555 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A well annotated on a historic map<br><br>* Aberdeenshire, Sheet XXI  Survey date: 1870,  Publication date: 1873 |

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|---|---|
| **Asset/Event Number** | 57 |
| **Asset/Event Name** | CLOCHCAN SCHOOL WAR MEMORIAL |
| **Type of Asset/Event** | Standing Structure |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ94SW0101 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 394711 |
| **Northing** | 843227 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Memorial cairn, of mortared stone set alongside the boundary wall of the former Clochcan School. A dedicatory tablet set into the front face is inscribed in black lettering: 'Memorial cairn of the 23 scholars who never returned 1914-1918'. The names of these scholars are not all known, although school registers mention six old pupils as having fallen during the war, three recorded in 1915, one in 1916, and two in 1917 although the last of these is noted as the 11th pupil from the school to have given his life. |

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|---|---|
| **Asset/Event Number** | 58 |
| **Asset/Event Name** | Buildings |
| **Type of Asset/Event** | Buildings |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 394670 |
| **Northing** | 843304 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Buildings inclduing a school and garden<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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|---|---|
| **Asset/Event Number** | 59 |
| **Asset/Event Name** | Walkenway |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 394944 |
| **Northing** | 843303 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A collection of buildings north of a road<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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|---|---|
| **Asset/Event Number** | 60 |
| **Asset/Event Name** | Hogshillock |
| **Type of Asset/Event** | Axehead (Flint) |
| **Listing No./NRHE Number** | NJ94SE 30 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 395100 |
| **Northing** | 843600 |
| **Parish** | Old Deer |

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|---|---|
| **Council** | Aberdeenshire |
| **Description** | NJ94SE 30 c. 951 436<br><br>A flint axe (no details given) 'from Hawkhillock, Old Deer' was an item in the collection of Mr W Smith, station agent at Maud, shown to the members of the Buchan Field Club in 1894. (Hawkhillock not located: ? Hogshillock, a farm at NJ 951 436).<br><br>Trans Buchan Fld Club 1895. |

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|---|---|
| **Asset/Event Number** | 61 |
| **Asset/Event Name** | SLAMPTON |
| **Type of Asset/Event** | Standing Structure |
| **Listing No./NRHE Number** | NJ94SE75 |
| **HER Number** | NJ94SE0094 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 395680 |
| **Northing** | 843390 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | FARMSTEADS- Four buildings depicted around a garden area depicted on a historic map<br><br>* Aberdeenshire, Sheet XXI  Survey date: 1870,  Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 62 |
| **Asset/Event Name** | PEDLAR'S GRAVE |
| **Type of Asset/Event** | |
| **Listing No./NRHE Number** | NJ94SE4 |
| **HER Number** | NJ94SE0032 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 395830 |
| **Northing** | 843610 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | Supposed site of graves. Depicted on the OS 1st and 2nd edition maps as 'Site of Pedlars' Graves' and traditionally said to be the site of the graves of pedlars who fought here. The OS Name Book 1879 noted that the graves had been visible not long previously. Now no trace.<br><br>NJ94SE 4 9583 4361<br><br>(NJ 9583 4361) Pedlars' Graves (NAT) (Site of)<br><br>OS 6" map (1959)<br><br>Traditionally the graves of pedlars who fought here. It is not long ago since the graves were |

quite visible.

Name Book 1879

No trace.

Visited by OS (ISS) 28 February 1973.

(Formerly also entered by GRC/AAS as NJ94SE 4).

NMRS, MS/2059.

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| | |
|---|---|
| **Asset/Event Number** | 63 |
| **Asset/Event Name** | Denward |
| **Type of Asset/Event** | Building |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 396037 |
| **Northing** | 843545 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Building south of road associated with a garden<br><br>* Aberdeenshire, Sheet XXI  Survey date: 1870,  Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 64 |
| **Asset/Event Name** | BOGIESAVOCH |
| **Type of Asset/Event** | Farmhouse (Period Unassigned), Farmstead (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SE76 |
| **HER Number** | NJ94SE0086 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 395818 |
| **Northing** | 843030 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | Farmstead, still in use, built in the later 19th century. The 1st edition OS map shows a group of seven small buildings named 'Bogiesavock', which on the 2nd edition OS map have been replaced by a U-plan steading with a small building to the west and an L-plan farmhouse to the south. Current OS maps show the building to the west has been removed, the court of the steading has been filled and there are alterations to the farmhouse. The spelling of the name has also been changed to 'Bogiesavoch'. A photographic survey of the steading was carried out in 2012 prior to proposed conversion. |

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|---|---|
| **Asset/Event Number** | 65 |
| **Asset/Event Name** | Sluice and Well |
| **Type of Asset/Event** | Sluice and Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 395837 |
| **Northing** | 843162 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A Sluice and Well depicted on historic map<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 66 |
| **Asset/Event Name** | SKIPLETON |
| **Type of Asset/Event** | Farmstead (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SE51 |
| **HER Number** | NJ94SE0039 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 396453 |
| **Northing** | 843272 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | NJ94SE 51 9645 4327<br><br>(Name cited as Skipleton and location as NJ 9645 4327). Site of a now-destroyed farmstead depicted on the 1st edition of the OS map (1867). It then comprised a rectangular building and an enclosure.<br><br>NMRS, MS/2059.<br><br>Site of a now destroyed croft or small farmstead depicted on the 1867 1st edition OS map. Both show a rectangular building and enclosure, to the west of which is a well, with a second rectangular building further to the west. Only the eastern building and enclosure appear on the OS 2nd edition 1888 map. |

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|---|---|
| **Asset/Event Number** | 67 |
| **Asset/Event Name** | TOLLYBRAE |
| **Type of Asset/Event** | Farmhouse (Period Unassigned), Farmstead (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SE41 |
| **HER Number** | NJ94SE0106 |

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|---|---|
| **Status** | Non-designated Heritage Asset |
| **Easting** | 396690 |
| **Northing** | 843125 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | FARMSTEADS associated with a well<br><br>NJ94SE 41 centred 9667 4312<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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|---|---|
| **Asset/Event Number** | 68 |
| **Asset/Event Name** | UPPER KINNADIE, AUCHNAGATT |
| **Type of Asset/Event** | Farmstead (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SE43 |
| **HER Number** | NJ94SE0110 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 396997 |
| **Northing** | 843035 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | Farmstead and farmhouse depicted on historic mapping. The 1st edition shows a U-plan steading. with court open to the southeast and attached horse-mill on the southwest. To the south is a T-plan house and garden. East of the steading is an enclosure with two buildings on its east side. There had been some changes by the time of the 2nd edition but not clear if the steading had been altered or replaced by a longer U-plan steading, still with a horse-mill on the southwest side. Another building had been added east of the house, and one of those east of the enclosure had been removed. The second building in the east and the horsemill have since been removed, and the steading is now derelict. The steading is stone-built with attic rooms in the north half of the west range. The farmhouse is a traditional stone built, one and a half storey building with high slate roof, dormer windows, with the kitchen as the rear part of the traditional T-plan. On the current OS edition map the steading is shown as Primrose Barn. A photographic survey was carried out in 2021 prior to proposed redevelopment of the steading. |

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|---|---|
| **Asset/Event Number** | 69 |
| **Asset/Event Name** | KINNADIE COTTAGE |
| **Type of Asset/Event** | Cottage (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SE44 |
| **HER Number** | NJ94SE0113 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 397159 |
| **Northing** | 843095 |
| **Parish** | Old Deer |

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|---|---|
| **Council** | Aberdeenshire |
| **Description** | Standing Structure |

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| | |
|---|---|
| **Asset/Event Number** | 70 |
| **Asset/Event Name** | KINALDIE |
| **Type of Asset/Event** | Standing Structure |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ94SE0054 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 397244 |
| **Northing** | 842981 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A milestone, inscribed 'ELLON 8' is shown on both the 1st and 2nd edtion OS maps and is still marked on the 2005 map. |

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|---|---|
| **Asset/Event Number** | 71 |
| **Asset/Event Name** | KINNADIE |
| **Type of Asset/Event** | Kinaldie, Kinaldie Estate |
| **Listing No./NRHE Number** | NJ94SE44 |
| **HER Number** | NJ94SE0085 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 397314 |
| **Northing** | 843171 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | Farmstead, still in use, depicted on historic OS maps. It is shown on the 1st edition OS map as a U-plan steading with a detached east range. There is a rectangular-plan building to the south, an L-plan and rectangular-plan building to the east and two wells to the north. On the 2nd edition OS map a large L-plan steading with attached horsemill has replaced or incorporated parts of the U-plan steading and nearby L-plan building and one of the wells has been infilled. Current OS maps show the steading has been extended and the horsemill removed, the building to the east has been removed and the remaining well infilled. A Level 1 Standing Building Survey of the steading was carried out in 2017 prior to proposed demolition. |

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|---|---|
| **Asset/Event Number** | 72 |
| **Asset/Event Name** | South Auchtylair |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | NJ94SE 42 |
| **HER Number** | |

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|---|---|
| **Status** | Non-designated Heritage Asset |
| **Easting** | 397704 |
| **Northing** | 843030 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A rectangular area of ground, enclosing at least four buildings<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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| | |
|---|---|
| **Asset/Event Number** | 73 |
| **Asset/Event Name** | Wells |
| **Type of Asset/Event** | Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 397864 |
| **Northing** | 842980 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Wells annotated on the historic maps<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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|---|---|
| **Asset/Event Number** | 74 |
| **Asset/Event Name** | Skelmuir Cottages |
| **Type of Asset/Event** | Cottage(S) (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SE 64 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 398030 |
| **Northing** | 843100 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | (Name cited as Skelmuir Cottages and location as NJ 9803 4310). Site of two now-destroyed cottages depicted on the OS 1st edition map (1867).<br><br>NMRS, MS/2059. |

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|---|---|
| **Asset/Event Number** | 75 |

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|---|---|
| **Asset/Event Name** | North Auchtylair |
| **Type of Asset/Event** | Farmhouse (Period Unassigned), Farmstead (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SE 48 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 398170 |
| **Northing** | 843490 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | L-shaped farmstead associated with gardens and a well annotated on a historic map<br><br>* Aberdeenshire, Sheet XXI Survey date: 1870, Publication date: 1873 |

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|---|---|
| **Asset/Event Number** | 76 |
| **Asset/Event Name** | Brae of Coynach |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | LB16055; NJ94SE 31 |
| **HER Number** | |
| **Status** | Listed Building- Category B |
| **Easting** | 399039 |
| **Northing** | 844059 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | A collection of buildings, incuding a U-shaped structure located within a area of landscpaing including a garden and area of woodland to the north<br><br>*Aberdeenshire, Sheet XXII Survey date: 1868-70, Publication date: 1872<br><br>LB16055 |

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| | |
|---|---|
| **Asset/Event Number** | 77 |
| **Asset/Event Name** | Brae Of Coynach, Mill Ponds |
| **Type of Asset/Event** | Mill Pond(S) (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SE 66 |
| **HER Number** | NJ94SE0050 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 399504 |
| **Northing** | 843904 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |

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|---|---|
| **Description** | (Name cited as Brae of Coynach and location as NJ 9918 4380). Remains of two mill ponds depicted on the OS 1st edition map (1867).<br><br>NMRS, MS/2059.<br><br>Two mill ponds are depicted on the 1867 1st edition OS map with a lade leading to the east towards Mill of Clola. By the 1888 edition there is only one large mill dam though the lade is still evident. Today there is still a pond but the lade is no longer evident. |

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|---|---|
| **Asset/Event Number** | 78 |
| **Asset/Event Name** | Skelmuir Cottages |
| **Type of Asset/Event** | Cottage(S) (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SE 32.02 |
| **HER Number** | NJ94SE0048 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 398150 |
| **Northing** | 843030 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | Site of two now destroyed rectangular cottages that are depicted on the 1867 1st edition OS map. |

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|---|---|
| **Asset/Event Number** | 79 |
| **Asset/Event Name** | Clola |
| **Type of Asset/Event** | Farmstead (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SE 63 |
| **HER Number** | NJ94SE0047 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 399750 |
| **Northing** | 844250 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | (Name cited as Clola and location as NJ 9975 4425). Site of now-destroyed farmstead depicted on the OS 1st edition map (1867). The map depicts a U-shaped range of buildings, a seperate L-shaped farmhouse, and several small enclosures.<br><br>NMRS, MS/2059.<br><br>Site of a now destroyed farmstead that is depicted on the 1867 1st edition OS map. It shows a U-shaped range of buildings, a separate Z-plan building, and a small rectangular building, together with several small enclosures. By the time of the 2nd edition OS map, 1888, the smallest building had been removed, and the Z-plan building modified to a T-plan. The U-plan remains unchanged. These buildings and enclosures have since all been removed, although a later building, Aucthmill, stands on the site of the enclosures at the north end of the farmstead |

site.

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|---|---|
| **Asset/Event Number** | 80 |
| **Asset/Event Name** | Mill Of Clola |
| **Type of Asset/Event** | Farmhouse (Period Unassigned) |
| **Listing No./NRHE Number** | NJ94SE 33 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 399686 |
| **Northing** | 844480 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | NJ94SE 33.00 9967 4451<br><br>NJ94SE 33.01 9966 4468 watermill<br><br>several buildings surrounding a road and associated with a well<br><br>*Aberdeenshire, Sheet XXII Survey date: 1868-70, Publication date: 1872 |

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| | |
|---|---|
| **Asset/Event Number** | 81 |
| **Asset/Event Name** | Cowles Well |
| **Type of Asset/Event** | Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 399521 |
| **Northing** | 844258 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Annotation on a historic map<br><br>*Aberdeenshire, Sheet XXII Survey date: 1868-70, Publication date: 1872 |

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|---|---|
| **Asset/Event Number** | 82 |
| **Asset/Event Name** | Post Office |
| **Type of Asset/Event** | Building |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |

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|---|---|
| **Easting** | 400196 |
| **Northing** | 844380 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Post office annotated on historic map<br><br>*Aberdeenshire, Sheet XXII Survey date: 1868-70, Publication date: 1872 |

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|---|---|
| **Asset/Event Number** | 83 |
| **Asset/Event Name** | Denvale |
| **Type of Asset/Event** | Hammer (Stone) |
| **Listing No./NRHE Number** | NK04SW 1 |
| **HER Number** | NK04SW0001 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 400180 |
| **Northing** | 844340 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |
| **Description** | NK04SW 1 0018 4434.<br><br>(NK 0018 4434) Stone Hammer found AD 1849 (NAT)<br><br>OS 6" map, (1959).<br><br>A stone hammer found by Mr Davidson (M Davidson, Bog of Durie) in 1849 was given to "a gentleman from Edinburgh".<br><br>Name Book 1870.<br><br>A stone hammer was found in this vicinity in 1849, and given to 'a gentleman from Edinburgh' by the finder Mr Davidson. Now no trace. |

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|---|---|
| **Asset/Event Number** | 84 |
| **Asset/Event Name** | Denvale |
| **Type of Asset/Event** | Cist (Period Unassigned) |
| **Listing No./NRHE Number** | NK04SW 2 |
| **HER Number** | NK04SW0002 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 400290 |
| **Northing** | 844620 |
| **Parish** | Old Deer |
| **Council** | Aberdeenshire |

| | |
|---|---|
| **Description** | NK04SW 2 0029 4462.<br><br>(NK 0029 4462) Stone Cist and Urn found AD 1849 (NAT)<br><br>OS 6" map, (1959).<br><br>A cist, containing an urn filled with small pieces of bone and blackish earth, was found during quarrying.<br><br>Name Book 1870.<br><br>No further information.<br><br>Visited by OS (RL) 27 April 1972.<br><br>A short cist was found in this area during quarrying being carried out in the 19th Century. It contained an urn filled with small pieces of bone and blackish earth. |

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|---|---|
| **Asset/Event Number** | 85 |
| **Asset/Event Name** | Buildings and well |
| **Type of Asset/Event** | Buildings |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 400126 |
| **Northing** | 844882 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Two buildings associated with an annotation of a well on a histori cmap<br><br>*Aberdeenshire, Sheet XXII Survey date: 1868-70, Publication date: 1872 |

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|---|---|
| **Asset/Event Number** | 86 |
| **Asset/Event Name** | Building and well |
| **Type of Asset/Event** | Fordsmouth |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 401083 |
| **Northing** | 845582 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A building associated with a well likely associated with Fordsmouth to the east<br><br>*Aberdeenshire, Sheet XXII Survey date: 1868-70, Publication date: 1872 |

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|---|---|
| **Asset/Event Number** | 87 |
| **Asset/Event Name** | Fordmouth |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 401233 |
| **Northing** | 845633 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A U-shaped courtyard farm open to the SE north of a road associated with ancillary buildings and a well<br><br>*Aberdeenshire, Sheet XXII Survey date: 1868-70, Publication date: 1872 |

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|---|---|
| **Asset/Event Number** | 88 |
| **Asset/Event Name** | Mill of Inverquhonery |
| **Type of Asset/Event** | Mills; Mill Lead; Grain Mill (Period Unassigned) |
| **Listing No./NRHE Number** | NK04NW 73 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 401439 |
| **Northing** | 845858 |
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | Centre point of sluice and mill lead<br><br>*Aberdeenshire, Sheet XXII Survey date: 1868-70, Publication date: 1872 |

| | |
|---|---|
| **Asset/Event Number** | 89 |
| **Asset/Event Name** | INVERQUHOMERY |
| **Type of Asset/Event** | Standing Structure |
| **Listing No./NRHE Number** | NK04NW12 |
| **HER Number** | NK04NW0075 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 401672 |
| **Northing** | 846415 |
| **Parish** | Longside |

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|---|---|
| **Council** | Aberdeenshire |
| **Description** | Remains of a designed landscape probably dating from the 19th Century.<br><br>Masson and Glennie. (1990) Inverquhomery House, Longside: {sale particulars}. {Peterhead}. RCAHMS Shelf Number: D.5.13.INV.S |

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|---|---|
| **Asset/Event Number** | 90 |
| **Asset/Event Name** | Mill-croft |
| **Type of Asset/Event** | Farmstead (Period Unassigned) |
| **Listing No./NRHE Number** | NK04NW 74 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 401706 |
| **Northing** | 846500 |
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | Depicted associated with a well on a historic map<br><br>*Aberdeenshire, Sheet XXII Survey date: 1868-70, Publication date: 1872 |

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| | |
|---|---|
| **Asset/Event Number** | 91 |
| **Asset/Event Name** | Inverquhomery |
| **Type of Asset/Event** | Water Meadow (Post Medieval) |
| **Listing No./NRHE Number** | NK04NW 66 |
| **HER Number** | NK04NW0076 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 402065 |
| **Northing** | 847255 |
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | Remains of Water Meadows line the north and south banks of the South Ugie Water east of Mintlaw between Baluss and Ugiebank farmsteads. The layout of the Meadows is visible on vertical aerial photographs taken in 1973 and 1988. From south of Baluss farmstead there is a small area of Water Meadow between the current course of the river and an oxbow lake to the east. To the east of this is the largest area of meadows in a flat-bottomed gentle valley. This is crossed by an extensive arrangement of ditches which enclose the whole area and sub-divide it into large rectangular areas. The area to the north of the river is shown clearly on the aerial photographs, with the ditches well defined in two areas divided by a vertical ditch. A site visit in 2005 discovered that these remains have been badly denuded by livestock. To the south of the river, the remains are less well preserved at this point, only appearing faintly on the 1988 aerial photographs together with the cropmark of another oxbow lake. The remains are then more slight further east. They are absent on the south for a section and then, near Ugiebank steading are visible on the 1988 photographs for a further section on the south bank. The northern bank has near continuous coverage of ditches, but some may be more modern drainage ditches. The |

first water meadows to be recorded in Aberdeenshire.

Visible on LiDAR Slope imagery

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| | |
|---|---|
| **Asset/Event Number** | 92 |
| **Asset/Event Name** | Great North of Scotland Railway - Formatine and Buchan Section |
| **Type of Asset/Event** | Railway |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 401915 |
| **Northing** | 848368 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Centre point of railway |
| | *Aberdeenshire, Sheet XXII Survey date: 1868-70, Publication date: 1872 |

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| | |
|---|---|
| **Asset/Event Number** | 93 |
| **Asset/Event Name** | Rifle Range |
| **Type of Asset/Event** | Rifle Range |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 402601 |
| **Northing** | 848540 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A rifle range annotated on historic map |
| | *Aberdeenshire, Sheet XXII Survey date: 1868-70, Publication date: 1872 |

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|---|---|
| **Asset/Event Number** | 94 |
| **Asset/Event Name** | Glen Ugie |
| **Type of Asset/Event** | Pit(S) (Period Unassigned)(Possible) |
| **Listing No./NRHE Number** | NK04NW 76 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 401980 |

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|---|---|
| **Northing** | 848630 |
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | A discrete cluster of four small possible pits has been recorded as cropmarking on oblique aerial photographs (RCAHMSAP 2013).<br><br>Information from RCAHMS 11 February 2015 |

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| | |
|---|---|
| **Asset/Event Number** | 95 |
| **Asset/Event Name** | Ardlaw Hill |
| **Type of Asset/Event** | Kerb Cairn (Prehistoric)(Possible) |
| **Listing No./NRHE Number** | NK04NW 43 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 403110 |
| **Northing** | 848800 |
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | Air photography (AAS/97/13/G28/18, 20 and AAS/97/13/CT, flown 13 November 1997) has recorded what may be the remains of a kerb-cairn in an area of rig-and-furrow cultivation in an area of rough grazing at an altitude of about 50m OD. Only part of the kerb remains (mainly in the southern half) and the location is below the crest of the hill.<br><br>NMRS, MS/712/30. |

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|---|---|
| **Asset/Event Number** | 96 |
| **Asset/Event Name** | Auchlee |
| **Type of Asset/Event** | Enclosure (Period Unassigned)(Possible) |
| **Listing No./NRHE Number** | NK04NW 28 |
| **HER Number** | NK04NW0008 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 403900 |
| **Northing** | 848800 |
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | An enclosure is visible as a cropmark in a cereal crop. It is round ended with an entrance in the south-east. |

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|---|---|
| **Asset/Event Number** | 97 |
| **Asset/Event Name** | Woodside |

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|---|---|
| **Type of Asset/Event** | Rig And Furrow (Medieval) |
| **Listing No./NRHE Number** | NK04NW 41 |
| **HER Number** | NK04NW0033 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 403550 |
| **Northing** | 848850 |
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | Air photography (AAS/97/13/G28/2-4, flown 13 November 1997) has recorded an area of rig-and-furrow cultivation in an area of grazing land on a gentle E-facing slope at an altitude of 35m OD.<br><br>NMRS, MS/712/30.<br><br>An area of reasonably well-preserved rig and furrow lie on the east side of Ardlaw Hill. The area was still covered in woodland in 1888 giving it protection from damage by agricultural ploughing. There are some modern drainage ditches cut through the rigs on the south side.<br><br>Visible on DSM LiDAR Slope imagery |

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| | |
|---|---|
| **Asset/Event Number** | 98 |
| **Asset/Event Name** | Woodside |
| **Type of Asset/Event** | Building |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 403966 |
| **Northing** | 849052 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Three buildings associated within a well on a historic<br><br>*Aberdeenshire, Sheet XIV Survey date: 1869-70, Publication date: 1872 |

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|---|---|
| **Asset/Event Number** | 99 |
| **Asset/Event Name** | Millbank House |
| **Type of Asset/Event** | House (19th Century) |
| **Listing No./NRHE Number** | LB9421; NK04NW 61 |
| **HER Number** | NK04NW0090 |
| **Status** | Listed Building- Category B |
| **Easting** | 404391 |
| **Northing** | 849040 |

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|---|---|
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | House and farmstead, still in use, depicted on the 1st and 2nd edition OS maps. The house is a large L-plan building, of two storeys, built sometime before 1828. It is harled, on a granite plinth, with a deeply recessed front door topped by a fanlight. The farmstead, a short distance to the NW of the house, is a U-plan steading open to the SE, which originally had a horse-engine attached to the outer W elevation. The house was built by Thomas and Robert Kilgour, who owned of the nearby Auchlee Mill which closed in 1828 and has since been lost. The house is B-Listed. A photo survey of the farmstead was carried out in 2013 prior to its conversion into a dwellinghouse.<br><br>Before 1828. Main part very large 2-storey 3-window harled margins, granite base, course and eaves course. Door deeply recessed. Fanlight, original woodwork, 2-window gables with 2 attic windows, big coped chimneys; square stair projection a back. Low 2-storey back wing perhaps earlier, pienided N gable; roof swept down to lean-to W. side.<br><br>Statement of Special Interest<br>Associated with the former woollen mill which closed in 1828 and of which no remains are in evidence. |

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|---|---|
| **Asset/Event Number** | 100 |
| **Asset/Event Name** | Millbank |
| **Type of Asset/Event** | Enclosure (Period Unassigned) |
| **Listing No./NRHE Number** | NK04NW 50 |
| **HER Number** | NK04NW0037 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 404330 |
| **Northing** | 848960 |
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | (Location cited as NK 0433 4897). This enclosure with a drystone wall is situated in flat agricultural ground at an altitude of about 25m OD.<br><br>NMRS, MS/712/38.<br><br>Site of enclosure with drystone wall, depicted on the 2nd edition OS map. |

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| | |
|---|---|
| **Asset/Event Number** | 101 |
| **Asset/Event Name** | Millbank |
| **Type of Asset/Event** | Building (Period Unassigned) |
| **Listing No./NRHE Number** | NK04NW 51 |
| **HER Number** | NK04NW0038 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 404650 |
| **Northing** | 848800 |

| | |
|---|---|
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | NK04NW 51 0465 4880<br><br>This ruined building is situated on a gentle SW-facing slope in agricultural ground at an altitude of about 25m OD.<br><br>NMRS, MS/712/38.<br><br>Site of three buildings, depicted on the 1st and 2nd edition OS maps. Not clear if any upstanding remains survive. |

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|---|---|
| **Asset/Event Number** | 102 |
| **Asset/Event Name** | Rora |
| **Type of Asset/Event** | Term Pending |
| **Listing No./NRHE Number** | NK04NE 42 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 405080 |
| **Northing** | 849050 |
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | Exact location uncertain at time of Architecture Catalogue Update.<br><br>A courtyard farmstead depicted on a historic map<br><br>*Aberdeenshire, Sheet XIV Survey date: 1869-70, Publication date: 1872 |

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| | |
|---|---|
| **Asset/Event Number** | 103 |
| **Asset/Event Name** | UGIE CANAL |
| **Type of Asset/Event** | Earthwork |
| **Listing No./NRHE Number** | |
| **HER Number** | NK04NE0025 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 408869 |
| **Northing** | 849168 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Remains of canal, now disused, which runs from NK 082 499 - NK 099 490. |

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|---|---|
| **Asset/Event Number** | 104 |

| | |
|---|---|
| **Asset/Event Name** | NEWSEAT |
| **Type of Asset/Event** | Standing Structure |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 407663 |
| **Northing** | 848678 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps associated with a well |

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| | |
|---|---|
| **Asset/Event Number** | 105 |
| **Asset/Event Name** | River Ugie |
| **Type of Asset/Event** | Pit (Period Unassigned) |
| **Listing No./NRHE Number** | NK04NE 17.01 |
| **HER Number** | NK04NE0034 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 408500 |
| **Northing** | 848970 |
| **Parish** | Peterhead |
| **Council** | Aberdeenshire |
| **Description** | In August 1998 CFA excavated an isolated pit in advance of the construction of a gas pipeline. It was situated on a gentle NW-facing slope in an area of agricultural ground at an altitude of about 20m OD; excavation showed that it measured 0.78 by 0.62m and 0.18m deep and was filled with dark brown sandy clay containing degraded sandstone fragments.<br><br>NMRS, MS/712/38. |

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|---|---|
| **Asset/Event Number** | 106 |
| **Asset/Event Name** | ST FERGUS PIPELINE |
| **Type of Asset/Event** | Event |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Event |
| **Easting** | 408569 |
| **Northing** | 848824 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A watching brief was carried out in 1998 by CFA along the route of a pipeline. Features recorded are: a truncated spread of ash (NK05SE0015), a crescent low mound of ash |

(NK05SE0016), ash spread filling a depression (NK05SE0017), flint and pottery artefacts (NK05SE0018), a curvilinear slot probably representing the remains of a foundation trench (NK05SE0019), a double circular palisade, hut stance and possible ring ditch (NK05SE0010), flint and pottery artefacts (NK04NE0036), two burnt mounds (NK04SE0053), an isolated pit (NK04NE0034) and a linear ditched feature (NK04NE0035).

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|---|---|
| **Asset/Event Number** | 107 |
| **Asset/Event Name** | Well |
| **Type of Asset/Event** | Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 408444 |
| **Northing** | 848851 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | An area of landscpaing associated with a well<br><br>*Aberdeenshire, Sheet XV Survey date: 1869, Publication date: 1872 |

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| | |
|---|---|
| **Asset/Event Number** | 108 |
| **Asset/Event Name** | River Ugie |
| **Type of Asset/Event** | Grain Mill (Period Unassigned), Lade (Period Unassigned), Sluice (Period Unassigned), Structure |
| **Listing No./NRHE Number** | NK04NE 17 |
| **HER Number** | NK04NE0038 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 408796 |
| **Northing** | 849104 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | An archaeological desk-based assessment and rapid field survey was undertaken in March 1997 on the proposed route of a pipeline running from St Fergus Offtake Station to the proposed pressure reducing station at Peterhead Power Station. Five sites situated within the corridor examined were listed in the NMRS. The following are amongst the sites identified in the assessment:<br><br>NK 0861 4929 - Levees.<br><br>NK 0852 4943<br><br>NK 0872 4935 - Levees.<br><br>NK 0855 4947<br><br>NK 0894 4889- Mill lade (site of). |

NK 0873 4928

NK 0892 4894 Sluice (site of).

NK 0899 4894 Corn mill (site of).

NK 0890 4893 Stepping stones (site of).

NK 0845 4885 (centre) Structure, well (site of), track (site of).

Several other enclosures, wells, tracks, field boundaries and dykes were also recorded. Fuller report in the NMRS.

Sponsor: Penspen Ltd.

R Strachan 1997.

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| | |
|---|---|
| **Asset/Event Number** | 109 |
| **Asset/Event Name** | Stonemills |
| **Type of Asset/Event** | Building (Period Unassigned) |
| **Listing No./NRHE Number** | NK04NE 33 |
| **HER Number** | NK04NE0029 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 408770 |
| **Northing** | 849220 |
| **Parish** | St Fergus |
| **Council** | Aberdeenshire |
| **Description** | This ruined building is situated next to a well on a gentle NW-facing slope in agricultural ground at an altitude of about 20m OD.<br><br>[Well indicated on 1973 edition of OS 1:10,000 map].<br><br>NMRS, MS/712/38. |

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|---|---|
| **Asset/Event Number** | 110 |
| **Asset/Event Name** | Building |
| **Type of Asset/Event** | Building |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 409148 |
| **Northing** | 849189 |
| **Parish** | |
| **Council** | Aberdeenshire |

| | |
|---|---|
| **Description** | Building depicted on historic map<br><br>*Aberdeenshire, Sheet XV Survey date: 1869, Publication date: 1872 |

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| | |
|---|---|
| **Asset/Event Number** | 111 |
| **Asset/Event Name** | Cairnhill |
| **Type of Asset/Event** | Farmstead (Period Unassigned) |
| **Listing No./NRHE Number** | NK04NE 34 |
| **HER Number** | NK04NE0030 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 409450 |
| **Northing** | 849080 |
| **Parish** | St Fergus |
| **Council** | Aberdeenshire |
| **Description** | This ruined farmstead is situated on a moderate S-facing slope in agricultural ground at an altitude of about 35m OD.<br><br>NMRS, MS/712/38.<br><br>Farmstead, depicted on the 1st and 2nd edition OS maps as an L-plan range and rectangular building forming three sides of a court open to the south. To the east is a T-plan house with attached garden enclosure. Current maps indicate that the west wing of the range and the smaller building have since been removed, and the rest of the range has been altered and extended. |

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|---|---|
| **Asset/Event Number** | 112 |
| **Asset/Event Name** | Hallmoss Cottage |
| **Type of Asset/Event** | Farmstead (Period Unassigned)(Possible) |
| **Listing No./NRHE Number** | NK04NE 27 |
| **HER Number** | NK04NE0117 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 409950 |
| **Northing** | 849050 |
| **Parish** | St Fergus |
| **Council** | Aberdeenshire |
| **Description** | What may be a farmstead, comprising one roofed and one unroofed building is depicted on the 1st edition of the OS 6-inch map (Aberdeenshire 1874, sheet xv). One roofed building and one enclosure are shown on the current edition of the OS 1:10000 map (1973).<br><br>Information from RCAHMS (AKK) 29 March 1999. |

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| | |
|---|---|
| **Asset/Event Number** | 113 |

# Gazetteer of Heritage Assets and Event

| | |
|---|---|
| **Asset/Event Name** | HALLMOSS BRIDGE |
| **Type of Asset/Event** | Bridge (Period Unassigned) |
| **Listing No./NRHE Number** | NK14NW143 |
| **HER Number** | NK14NW0596 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 410009 |
| **Northing** | 849009 |
| **Parish** | St Fergus |
| **Council** | Aberdeenshire |
| **Description** | Standing Structure- BRIDGES<br><br>This bridge, which is visible on the 1st edition of the OS 6-inch map (Aberdeenshire 1872, sheet xv) and on the current edition of the OS 1:10000 map (1990), is situated just to the N of Hallmoss Basin (NK04NE 13.02) at the start of the Inverquinzie Branch of the canal (NK14NW 143.01).<br><br>Information from RCAHMS (MD) 6 June 2002. |

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| | |
|---|---|
| **Asset/Event Number** | 114 |
| **Asset/Event Name** | Saint Fergus And North Ugie Water Canal, Hallmoss Basin |
| **Type of Asset/Event** | Canal Basin (Period Unassigned) |
| **Listing No./NRHE Number** | NK04NE 13.02 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 409980 |
| **Northing** | 848980 |
| **Parish** | Longside |
| **Council** | Aberdeenshire |
| **Description** | This basin, at the junction of the main canal and the Inverquinzie branch, is clearly shown on the 1st edition of the OS 6-inch map (Aberdeenshire 1872, sheet xv).<br><br>Information from RCAHMS (MD) 30 May 2002.<br><br>LIN 15. NK 0549 4857 to NK 1028 4876 and NK 1047 5096.<br><br>Formerly LIN 536.<br><br>History.<br><br>As early as 1793 the notion of constructing this canal to open up the countryside inland from Peterhead was being mooted. The purpose was to obviate difficulties caused by the absence of convenient markets and seaports. Admiral James Fergusson of Pitfour commenced work on this private canal before the end of the century in the parish of St. Fergus for the purpose of benefiting his estates which were located in the Longside and Old Deer parishes. However, although he built four miles, the undertaking, which was abandoned about 1800, was never completed due to problems in negotiating with neighbouring heritors. It is not apparent whther the canal, which was disused by 1868 and indeed filling up by 1845, achieved any more than |

offering a supply of water. The original plan had been to cut the canal along the north bank of the River Ugie, entering the sea some distance to the north of Peterhead, but, as stated above, only part of this was ever built.

Nonetheless, although Fergusson failed to reach Peterhead, during the early part of the nineteenth century a branch heading north to Inverquinzie (close to St. Fergus) was constructed so that shell-sand could be conveyed inland to act as manure on the farms. This sand, taken fron the sea-shore close to the mouth of the Black Water (NK 106 532) was expected to bring great benefits. Road transport was presumably to have been used to take the sand to Inverquinzie. Certainly, although a subsidiary canal crossing the Scotstoun Flats appears to be suggested on the maps of Robertson (1822) and Gibb (1858), this was not the case. These flats are approximately forty feet lower than Inverquinzie and the wide ditch in the area was in actuality part of a substantial land drainage scheme. This branch, however, also failed and by 1837 was rapidly filling up and only regarded as useful as a reservoir to supply water for the farms.

According to Thomson's map of 1826, the canal ran from Annachie (NK 1057 5303) to the River Ugie at NK 0549 4857, whence the South Ugie Water was utilised as far as the lake in the parkland of Pitfour House (NJ 97 48). At this point the canal reappeared and continued as far as Bogenjohn (NJ 93 52). Whyte's map of 1842 does not show this latter part from the lake to Bogenjohn, but indicates a spur from Hallmoss (NK 1998 4897) to NK 1028 4876. It was intended that this spur would extend to Peterhead but it was never completed. It is possible that the proposed course of the canal from Pitfour to Bogenjohn may have been inserted into Thomson's map, as well as a projection north of Inverquinzie.

New Statistical Account, Volume 12, 1845; A Graham 1967-8; J Lindsay 1968.

Summary.

(Map sheets NK04NE, NK05SE, NK14NW and NK15SW).

NB. The line and sites are taken from the 1st edition of the OS 6-inch maps (Aberdeenshire 1872, sheets xxii, xiv and xv).

The canal (NK04NE 13.00) commences on map sheet NK04NE, heading generally NE from a point just W of the junction of North Ugie Water with South Ugie Water, keeping to the N of the River Ugie. After twice passing briefly into map sheet NK05SE it heads S then E, leaving the map sheet just S of Hallmoss Cottage. There are four features traceable on this map sheet. Firstly, there is a small basin (NK04NE 13.03) formed by the widening of the canal on its NW side and then a small bridge (NK04NE 13.04) a little further N. Both sites are a short distance to the S of Artlaw Bridge. As the canal heads S it is crossed by a small bridge (NK04NE 13.01) near Stonemills Corn Mill and, as it turns NE again to leave the map sheet, there is a basin (NK04NE 13.02), which is situated in the Hallmoss area at the junction of the main canal and the Inverquinzie Branch (NK14NW 143.00 and NK15SW 5.00).

Prior to this the waterway (NK05SE 10.00) has described two brief meanders into map sheet NK05SE. Having passed through a small basin (NK05SE 10.02) it crosses the Crooko Burn on a short aqueduct (NK05SE 10.01), just S of Artlaw Bridge. As the canal finally returns to map sheet NK04NE there is a sluice (NK05SE 10.03) to the SW of Edine, associated with its drainage system.

The two branches of the waterway are traceable on map sheet NK14NW, the Peterhead line (NK14NW 143.00) and the Inverquinzie Branch (NK14NW 143.01). The Peterhead line comprises a short stretch of uncompleted canal heading SE towards Peterhead and ending in a field. There is a basin (NK14NW 143.03) in the Hallmoss area, just E of the basin (NK04NE 13.02) on map sheet NK04NE, and situated on the main Peterhead line near its junction with the Inverquinzie Branch. There are four sites associated with this branch as it heads in a mainly northerly direction; a small bridge (NK14NW 143.04) just N of the above-mentioned basins in the Hallmoss area, a very short aquedust (NK14NW 143.02) over what appears to be a drainage channel, a sluice (NK14NW 143.05) at the head of a mill lead heading SE to Lunderton and another small bridge (NK14NW 143.06) a little distance to the N of the sluice.

The Inverquinzie Branch (NK15SW 5.00) continues N on map sheet NK15SW, crossing the Cuttie Burn, which passes through a culvert (NK15SW 5.02) beneath the canal, and terminating in a fairly long, narrow canal basin (NK15SW 5.01) at Inverquinzie.

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| **Asset/Event Number** | 115 |
| **Asset/Event Name** | HALLMOSS AQUEDUCT |
| **Type of Asset/Event** | AQUEDUCTS |
| **Listing No./NRHE Number** | NK14NW143 |
| **HER Number** | NK14NW0598 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 410100 |
| **Northing** | 849170 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Ruined aqueduct.<br><br>Information from OS (CS), transferred from field sheet dated December 1968.<br><br>This aqueduct is visible on the 1st edition of the OS 6-inch map (Aberdeenshire 1872, sheet xv) and on the current edition of the OS 1:10000 map (1990).<br><br>Information from RCAHMS (MD), 6 June 2002. |

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|---|---|
| **Asset/Event Number** | 116 |
| **Asset/Event Name** | LUNDERTON FARM |
| **Type of Asset/Event** | |
| **Listing No./NRHE Number** | NK14NW1 |
| **HER Number** | NK14NW0001 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 410228 |
| **Northing** | 849190 |
| **Parish** | St Fergus |
| **Council** | Aberdeenshire |
| **Description** | Site of a souterrain found in the 1860s in a natural hillock. The chamber was aligned north-south with a narrow entrance passage at the South end circa 0.61 m wide. The sides were 1.21-1.82 m high and built of rough boulders, clay and turf. The floor was of earth with the remains of a fireplace, covered with 76 cm deep of burned peat ashes, on the east side of the floor. No artefacts were found. No trace remains to indicate site.<br><br>On the farm of Lunderton is a naturally dry gravelly hillock, on which is a mound 8 to 10ft high, in a cultivated, wet, clay, field at the side of what had been a large loch. Within the mound was a small chamber about 8ft east to west by 12ft north to south, with an earth floor, on undisturbed sub-soil, and the remains of a fireplace on the east side covered with 3ins of peat ash. There was a narrow passage or entrance about 2ft wide, at the south end of the mound. |

The sides of the chamber stood 4 to 6 ft in height and were formed of "rough boulders of stone and clay, or turf" except for the north end which was partly natural soil. Nothing was found within the chamber but boulders which had tumbled down from the sides.

A Murray 1863.

There is no ground evidence of this structure on the farm of Lunderton. The farmer has heard of such a feature and remembers being told by an Edinburgh Archaeologist several years ago that the probable site was on the summit of a hillock at NK 1024 4921. A water tank has been erected at the spot. The farmer confirmed that the hillock is gravelly and that the field in which it lies is of wet clay with poor drainage.

Visited by OS (EGC) 30 November 1962.

No change.

Visited by OS (RL) 17 December 1968.

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|---|---|
| **Asset/Event Number** | 117 |
| **Asset/Event Name** | Saint Fergus And North Ugie Water Canal, Inverquinzie Branch |
| **Type of Asset/Event** | Canal (Period Unassigned) |
| **Listing No./NRHE Number** | NK14NW 143.01 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 410370 |
| **Northing** | 849380 |
| **Parish** | St Fergus |
| **Council** | Aberdeenshire |
| **Description** | NK14NW 143.01 1000 4902 to 1029 4999. LIN 15. |

Formerly LIN 536.

For Lunderton Aqueduct (NK 1009 4917), see NK14NW 143.02.

(Inverquinzie branch)

NK 1000 4903 - 1009 4917

Canal deepened to form modern ditch and contained by fences.

NK 1009 4917 - 1038 4939

NW bank of canal ploughed down and barely visible.

NK 1038 4939 - 1028 4999

Disused canal well-preserved as a marshy basin, 7-10m wide.

Information from OS (CS), transferred from field sheet dated December 1968.

From Inverquinzie (NK 104 509) 'the cut pursues a sinuous course' 'to a point 160 yds W of Lunderton' (NK 103 493); 'beyond this point it has been filled up, but its line is perpetuated by a

field ditch and is shown by the 25-inch OS map of 1870 to have joined the main canal at Hallmoss' (NK 0999 4897). 'Near Lunderton, it still holds some water.'

A Graham 1969.

This branch is clearly marked on the 1st edition of the OS 6-inch map (Aberdeenshire 1872, sheet xv) and also the current edition of the OS 1:10000 map (1990) as canal (disused). It heads nE and then NW from a junction with the main line of the canal (NK14NW 143.00) at Hallmoss Basin (NK04NE 13.02).

Information from RCAHMS (MD) 6 June 2002.

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| | |
|---|---|
| **Asset/Event Number** | 118 |
| **Asset/Event Name** | Buildings |
| **Type of Asset/Event** | Buildings |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 410170 |
| **Northing** | 848910 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Buildings depicted as Hallcross at a historic map<br><br>*Aberdeenshire, Sheet XV Survey date: 1869, Publication date: 1872 |

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|---|---|
| **Asset/Event Number** | 119 |
| **Asset/Event Name** | LUNDERTON |
| **Type of Asset/Event** | Listed Building |
| **Listing No./NRHE Number** | LB19799; NK14NW399 |
| **HER Number** | NK14NW0404 |
| **Status** | Listed Building- Catgeory C |
| **Easting** | 410518 |
| **Northing** | 849332 |
| **Parish** | St Fergus |
| **Council** | Aberdeenshire |
| **Description** | Farmstead, still in use, with a C-listed farmhouse built in circa 1800. It is shown on the 1st edition OS map as a U-plan steading with a range extending to the west. There are two buildings to the west, a pond to the south and a roadside building to the east. The farmhouse has a U-plan northern section and is set within a wooded garden enclosure. On the 2nd edition OS map there are various additions to the steading and the pond has been infilled. Current OS maps show further additions and alterations to the steading, with the range extending to the west depicted as roofless. The smaller of the buildings to the west has been mostly removed, possibly with some walls remaining, and the roadside building to the east has been removed. There are some alterations shown to the farmhouse, which is a two-storey, three-window |

building constructed from coursed red granite with blue granite at the lintels. A piend roof has large coped chimneys at each gable. The door is deeply recessed and there is a single-storey back wing.

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|---|---|
| **Asset/Event Number** | 120 |
| **Asset/Event Name** | Lunderton |
| **Type of Asset/Event** | Unidentified Flint(S) (Flint) |
| **Listing No./NRHE Number** | NK14NW 169 |
| **HER Number** | NK14NW0086 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 410535 |
| **Northing** | 849388 |
| **Parish** | St Fergus |
| **Council** | Aberdeenshire |
| **Description** | NK 105 493. Three flints (an end scraper and two flakes) were found on the farm of Lunderton. Returned to finder - details with NMS (ARCH TTNC 1997/10).<br><br>F Hunter 1999. |

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|---|---|
| **Asset/Event Number** | 121 |
| **Asset/Event Name** | Lunderton Cottage |
| **Type of Asset/Event** | Farmstead (Period Unassigned) |
| **Listing No./NRHE Number** | NK14NW 168 |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 410590 |
| **Northing** | 849300 |
| **Parish** | St Fergus |
| **Council** | Aberdeenshire |
| **Description** | A farmstead, comprising six roofed, two unroofed buildings and four enclosures are depicted on the 1st edition of the OS 6-inch map (Aberdeenshire 1874, sheet xv). Four roofed buildings and three enclosures are shown on the current edition of the OS 1:10000 map (1990).<br><br>Information from RCAHMS (AKK) 29 March 1999 |

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|---|---|
| **Asset/Event Number** | 122 |
| **Asset/Event Name** | Mill Lead |
| **Type of Asset/Event** | Mill Lead |
| **Listing No./NRHE Number** | |
| **HER Number** | |

| | |
|---|---|
| **Status** | Non-designated Heritage Asset |
| **Easting** | 410534 |
| **Northing** | 849429 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Mill lead annotated on the historic map to the north of Lunderton<br><br>*Aberdeenshire, Sheet XV Survey date: 1869, Publication date: 1872 |

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| | |
|---|---|
| **Asset/Event Number** | 123 |
| **Asset/Event Name** | Building and Well |
| **Type of Asset/Event** | Building and Well |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 411449 |
| **Northing** | 849117 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Building and Well annoated on historic maps<br><br>*Aberdeenshire, Sheet XV Survey date: 1869, Publication date: 1872 |

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| | |
|---|---|
| **Asset/Event Number** | 124 |
| **Asset/Event Name** | Drain/ Lade |
| **Type of Asset/Event** | Water Management |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 405095 |
| **Northing** | 848713 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A NW-SE aligned linear feature depicted on a historic maps<br><br>*Aberdeenshire, Sheet XIV Survey date: 1869-70, Publication date: 1872<br><br>A linear feature and bank visisble on DTM Hillshade imagery possibly associated with two rectangular platforms |

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|---|---|
| **Asset/Event Number** | 125 |
| **Asset/Event Name** | Field drain |
| **Type of Asset/Event** | Field drain (Modern) |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 393658 |
| **Northing** | 844125 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A small circular mound c. 5m in diamater and 1m tall, under grass. The landowner explained that this was a mounded area of soil over a field drain that he had excavated, one of several within this area. While the mound is outwith the Site, the drain extends into Site to the northwest to Asset 127.<br><br>*SW<br>*Walkover Survey<br>*21/06/2023 |

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| | |
|---|---|
| **Asset/Event Number** | 126 |
| **Asset/Event Name** | Field drain |
| **Type of Asset/Event** | Field drain (Modern) |
| **Listing No./NRHE Number** | |
| **HER Number** | |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 393625 |
| **Northing** | 844189 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A open section of ground measuring c. 1m by 1m, full of water. The landowner explained that this was an area he had excavated in an attempt to unblock an underlying field drain that likely leads to Asset 125 to southeast.<br><br>*SW<br>*Walkover Survey<br>*21/06/2023 |

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| | |
|---|---|
| **Asset/Event Number** | 127 |
| **Asset/Event Name** | Ditch |
| **Type of Asset/Event** | Drainage ditch (Unknown date) |
| **Listing No./NRHE Number** | |
| **HER Number** | |

| | |
|---|---|
| **Status** | Non-designated Heritage Asset |
| **Easting** | 383910 |
| **Northing** | 845013 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | A broad linear ditch measuring c. 2-3m wide and c. 40m long, aligned north-south, under grass. Gradually sloping sides, c. 0.3-4m deep. Leads downhill to the south towards a drainage ditch that feeds the Little Water stream course. Possibly a former open cut drainage ditch since silted up. Unknown date .<br><br>*SW<br>*Walkover Survey<br>*21/06/2023 |

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| | |
|---|---|
| **Asset/Event Number** | 128 |
| **Asset/Event Name** | Kiddshill |
| **Type of Asset/Event** | Farmstead |
| **Listing No./NRHE Number** | |
| **HER Number** | NJ94SW0111 |
| **Status** | Non-designated Heritage Asset |
| **Easting** | 393405 |
| **Northing** | 843863 |
| **Parish** | |
| **Council** | Aberdeenshire |
| **Description** | Farmstead depicted on historic OS maps. |

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GREEN VOLT

# Appendix 13.1

## Green Volt Transport Assessment

Onshore EIA Report: Volume 3

Pell Frischmann

# Green Volt Grid Connection: Onshore Infrastructure

## Transport Assessment

August 2023

107749

| **Report Ref.** | | **Green Volt Grid Connection_TA_v2** | | | | |
|---|---|---|---|---|---|---|
| **File Path** | | **https://pellf.sharepoint.com/sites/EdinburghOfficeTeam/Shared Documents/General/Projects/107749 Flotation Energy Green Volt/01 - WIP/Reports/Appendix 13.1 - Green Volt Transport Assessment A2.docx** | | | | |
| **Rev** | **Suit** | **Description** | **Date** | **Originator** | **Checker** | **Approver** |
| V1 | | Draft for client comment | 12-July-2023 | E Moran | S Cochrane | G Buchan |
| V2 | | Updated following review | 31-July-2023 | E Moran | S Cochrane | G Buchan |
| V3 | | Final | 02-August-2023 | E Moran | S Cochrane | G Buchan |
| | | | | | | |

Ref. reference. Rev revision. Suit suitability.

**Prepared for**

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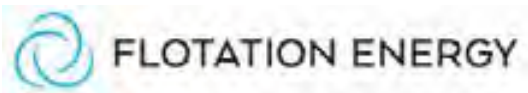


Pell Frischmann

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## Appendices

# 1 Introduction

## 1.1 Purpose of the Report

Pell Frischmann Ltd. (PF) has been commissioned by Flotation Energy Ltd., on behalf of Green Volt Offshore Windfarm Ltd. (the Applicant), to undertake a Transport Assessment (TA) for the proposed Green Volt Onshore Infrastructure development (Proposed Development).



The report identifies the key transport and access issues associated with the Proposed Development. The TA identifies where the Proposed Development may require mitigation works to accommodate the predicted traffic; however, the detailed design of these remedial works is beyond the agreed scope of this report.

## 1.2 Report Structure

Following this introduction, the TA report is structured as follows:

- Chapter Two describes the Proposed Development;
- Chapter Three reviews the relevant transport and planning policies;
- Chapter Four sets out the methodology used within this assessment;
- Chapter Five describes the baseline transport conditions;
- Chapter Six describes the trip generation and distribution of traffic in the Study Area;
- Chapter Seven summarises the traffic impact assessment;
- Chapter Eight considers mitigation proposals for development related traffic within the study network; and
- Chapter Nine summarises the findings of the TA and outlines the key conclusions.

# 2 Proposed Development

## 2.1 Site Location

The Proposed Development is to be located between the proposed interface point for the offshore/onshore cabling to the north of Peterhead and the New Deer Substation, Turriff[1]. The proposed Route Corridor of the Proposed Development is presented in Figure 1 below.

**Figure 1 Proposed Route Corridor (courtesy of Green Cat Renewables)**

## 2.2 Proposed Development

In order to connect the proposed Green Volt Offshore Wind Farm to the national grid, a new buried export cable is required to connect the development at the offshore/onshore interface, to proposed new substation beside the existing National Grid New Deer Substation (NGNDSS).

The Proposed Development therefore consists of electrical cables and a new substation, in addition to a small number of temporary work elements required as part of the installation process. The key elements of the Proposed Development are as follows:

- Landfall/Horizontal Directional Drilling (HDD) compound;
- Joint bays (underground);
- Electrical cables installed in a single trench;
- Temporary working area alongside trench;
- Temporary storage and welfare compounds that move along the cable route;

[1] Please note that the Proposed Development comprises of the Northern Cable Route Corridor detailed in the Green Volt Offshore Windfarm – Onshore Infrastructure: EIA Scoping Report, December 2022.

- Temporary compounds associated with trenchless crossings that move along the route; and
- A new substation with temporary construction compound.

The Proposed Development would have an operational life of 50 years.

# 3 Transport Policy Review

## 3.1 Introduction

This appendix of the EIA Report provides an overview of the relevant national and local transport planning policy and guidance.

### 3.1.1 National Planning Framework 4

The National Planning Framework 4 (NPF4) was approved by Scottish Parliament and was adopted on 13 February 2023. Policy 11: Energy within the NPF4 notes that:

*"Development proposals for all forms of renewable, low-carbon and zero emissions technologies will be supported. These include:*

- *Wind farms including repowering, extending, expanding and extending the life of existing wind farms;*
- *Enabling works, such as grid transmission and distribution infrastructure; and*
- *Energy storage, such as battery storage and pumped storage hydro.*

*In addition, project design and mitigation will demonstrate how the following impacts are addressed:*

- *Impacts on communities and individual dwellings, including, residential amenity, visual impact, noise and shadow flicker;*
- *Public access, including impact on long distance walking and cycling routes and scenic routes;*
- *Impacts on road traffic and on adjacent trunk roads, including during construction; and*
- *Cumulative impacts."*

### 3.1.2 Planning Advice Note (PAN) 75

Planning Advice Note (PAN) 75: Planning for Transport provides advice on the requirements for Transport Assessments. The document notes that:

*"transport assessment to be produced for significant travel generating developments. Transport Assessment is a tool that enables delivery of policy aiming to integrate transport and land use planning."*

*"All planning applications that involve the generation of person trips should provide information which covers the transport implications of the development. The level of detail will be proportionate to the complexity and scale of the impact of the proposal.... For smaller developments the information on transport implications will enable local authorities to monitor potential cumulative impact and for larger developments it will form part of a scoping exercise for a full transport assessment. Development applications will therefore be assessed by relevant parties at levels of detail corresponding to their potential impact."*

### 3.1.3 Transport Assessment Guidance (2012)

Transport Scotland's (TS) *Transport Assessment Guidance* was published in 2012. It aims to assist in the preparation of Transport Assessments (TA) for development proposals in Scotland such that the likely transport effects can be identified and dealt with as early as possible in the planning process. The document sets out requirements according to the scale of development being proposed.

The document notes that a TA will be required where a development is likely to have significant transport effects but that the specific scope and contents of a TA will vary for developments, depending on location, scale and type of development.

## 3.2 Local Policy and Guidance

### 3.2.1 Aberdeenshire Local Development Plan (2023)

The Aberdeenshire Local Development Plan (ALDP) was adopted in January 2023. In relation to the Proposed Development, the ALDP's Policy C2 Renewable Energy C2.1 notes that:

*"We will support renewable energy developments, including solar, wind, biomass (energy from biological material derived from living, or recently living organisms) and hydroelectricity projects, as well as energy storage projects, which are in appropriate sites and of the appropriate design. Assessment of the acceptability of such developments will take account of any effects on: socio-economic aspects; renewable energy targets; greenhouse gas emissions; communities; landscape and visual aspects; natural heritage; carbon rich soils; the historic environment; tourism and recreation; aviation, defence, telecommunications and broadcasting interests; road traffic; hydrology; and opportunities for energy storage."*

Section 14: The Responsibilities of Developers, Policy RD1.8 Access to New Development notes that:

*"Any new private access onto a public road must be designed to the satisfaction of Aberdeenshire Council's Road and Transportation Service and, in the case of a trunk road, Transport Scotland. Developers should be aware of the Aberdeenshire Standards for Road Construction Consent and Adoption, and the need for Roads Construction Consent in most instances. A Transport Assessment (or for smaller proposals a Transport Statement) may be asked for, to demonstrate that the development (and any proposed mitigation measures) will not have significant transport impacts on existing transport infrastructure and services."*

### 3.2.2 Use of Wind Energy in Aberdeenshire: Guidance for Developers – Supplementary Planning Guidance (2005)

In relation to transportation, the supplementary guidance document states that:

*"Consideration should be given to potential cumulative impact on … traffic and transport"*

It should be noted that Aberdeenshire Council is currently at Stage 3 (Examination) of the local development plan process for their Local Development Plan 2022. It is expected that the LDP 2022 will be adopted in the first half of 2022.

## 3.3 Policy Summary

The Proposed Development can align with the stated policy objectives and the design of the Site and proposed mitigation measures will ensure compliance with both national and local objectives.

# 4 Study Methodology

## 4.1 Introduction

There are three phases of the Proposed Development, which have been considered in this assessment and are as follows:

- The construction phase;
- The operational phase; and
- The decommissioning phase.

## 4.2 Project Phases – Transport Overview

Of the three aforementioned phases, the construction phase is considered to have the greatest potential impact in terms of transport. Construction plant, bulk materials and transformers will be transported to Site, these may potentially cause a significant increase in traffic on the study network.

The operational phase is restricted to occasional maintenance operation which generate significantly lower volumes of traffic that are not considered to be in excess of daily traffic variation levels on the road network.

The decommissioning phase involves fewer trips on the network than the construction phase, as minor elements of infrastructure such as cables are likely to be left in place.

It should be noted however that the construction effects are temporary and transitory in nature.

## 4.3 Scoping Discussions

The Applicant submitted a request for Scoping Opinion to the Scottish Ministers in respect of the Environmental Impact Assessment. While the Scoping Report outlined that the topic of Traffic and Transport should be scoped out of the assessment, Aberdeenshire Council Officers requested that the topic should be included in the assessment. Scoping responses were received from Aberdeenshire Council Officers and Transport Scotland. These can be found in **Appendix 1.4** of the **Onshore EIA Report**.

# 5 Baseline Conditions

## 5.1 Access Arrangements

Access to the Proposed Development will be taken from newly provided access junctions along the cable route. Materials will be delivered to the Proposed Development via these access junctions. The locations of the newly provided access junctions along the route of the Proposed Development are shown in Figure 2.

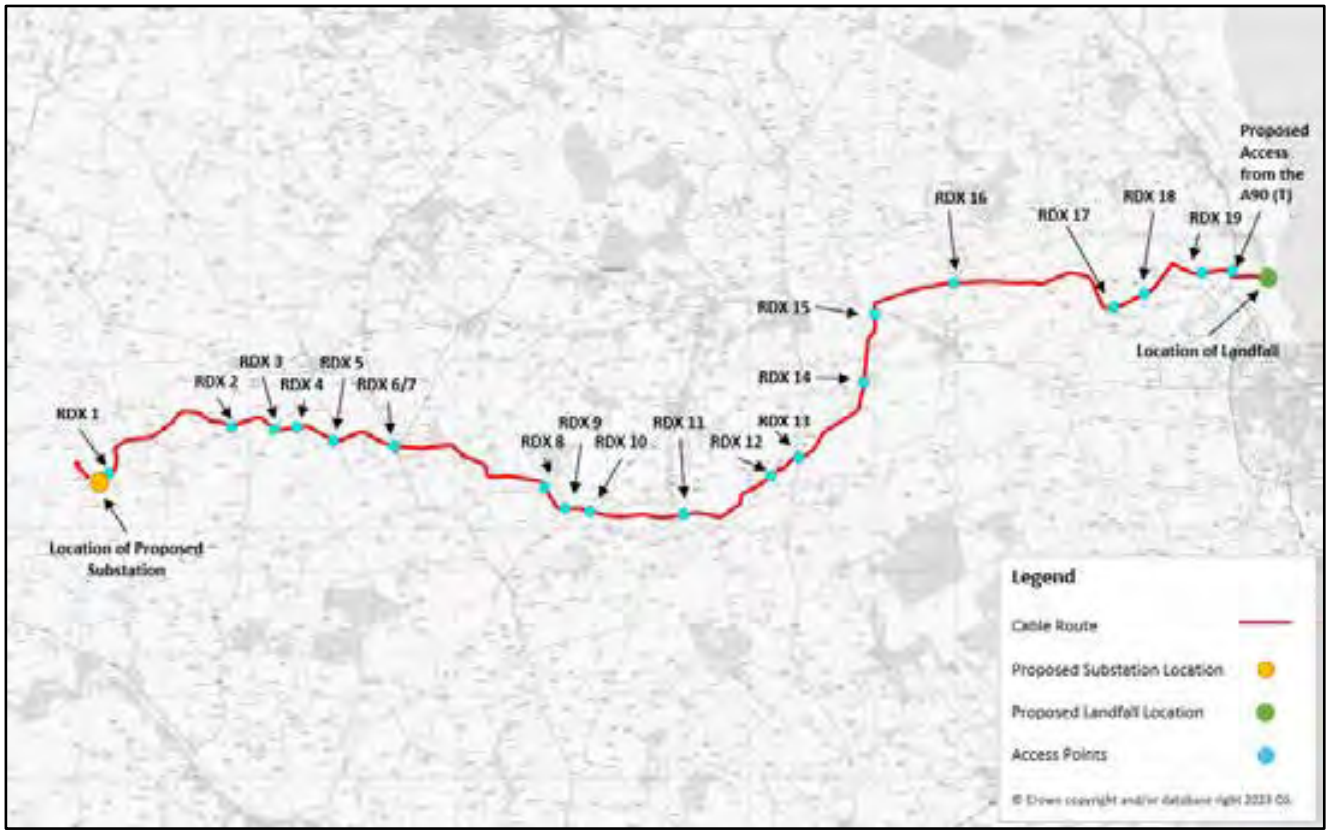


**Figure 2 Proposed Access Points**

The locations of the accesses are as detailed in Table 1.

**Table 1 Access Points**

| Access Point | Road Name | Location |
|---|---|---|
| RDX1 | Unnamed | Approx. 550 m southeast of New Deer Substation |
| RDX2 | Unnamed | Approx. 1.5 km east of Tillyfar |
| RDX3 | B9170 | Approx. 300 m southwest of Unnamed road (East of Tillyfar) / B9170 junction |
| RDX4 | Unnamed | Approx. 350 m south of B9170 / Unnamed road signed from Knaven |
| RDX5 | Lang Stracht | Approx. 1.65 km south of B9170 / Stoneybank Terrace junction |
| RDX6 | A948 | At A948 / B9106 crossroads |
| RDX7 | B9106 | At A948 / B9106 crossroads |
| RDX8 | Woodside | Approx. 1.6 km east of Kiddshill / Woodside junction |
| RDX9 | Unnamed | Approx. 260 m north of B9030 / Unnamed road signed for Maud junction |
| RDX10 | B9030 | Approx. 550 m east of B9030 / Unnamed road signed for Maud junction |
| RDX11 | Unnamed | Approx. 2.4 km south of B9030 / Mill Street junction (near Kinnadie) |
| RDX12 | Unnamed | Approx. 60 m southeast of road signed as Milton of Clola / road to Stuartfield junction |
| RDX13 | A952 | Approx. 1.55 km south of A952 / Yokieshill Cottages crossroads |

| Access Point | Road Name | Location |
|---|---|---|
| RDX14 | Yokieshill Cottage | Approx. 245 m southwest of Yokieshill Cottages / Inverquhomery Cottages junction |
| RDX15 | A950 | Approx. 1.55 km west of A950 / Nether Aden Road junction |
| RDX16 | Station Terrace | Approx. 685 m north of Bridgend Road / Station Terrace |
| RDX17 | Unnamed | Approx. 585 m north of Longside Airfield Industrial Estate |
| RDX18 | Unnamed | Class C road to the east of RDX 17 |
| RDX19 | Unnamed road leading to Rora | Approx. 800 m northwest of A90 (T) / Unnamed road leading to Rora junction |
| Proposed Access from the A90 (T) | A90 (T) | Western access approx. 465 m north of A90 (T) / Unnamed road leading to Rora junction and eastern access approx. 325 m north of A90 (T) / Unnamed road leading to Rora junction |

The proposed access junctions located along the local road network will comprise bellmouth junctions and will be designed in accordance with Aberdeenshire Council's standards. Applications for the junctions will be made to Aberdeenshire Council through the technical approval process and applications for Road Opening Permits would be made following technical approval.

It is proposed that the cable element of the Proposed Development will commence works at the Substation and construction will continue from east to west, and then finishing at the Landfall / HDD compound to the west of Craigewan links golf course.

A construction haul road will be provided adjacent to the cable route which will facilitate the movement of construction plant and materials involved in construction activities.

Two temporary Main Site Compounds are to be provided, one of which is located near the existing NGNDSS and the other located from an upgraded access to the west of the A90 (T). The Main Site Compounds have been identified as the most suitable areas to accommodate the required material, plant and equipment storage. These sites could each accommodate approximately 100% of the entire onshore cable route storage and mobilisation requirements. Other mobilisation and storage areas along the route will be utilised at the time of construction.

The existing gated access to the temporary compound to the west of the A90 (T) and new access to the east of the A90 (T) will be designed in accordance with the Design Manual for Roads and Bridges (DMRB) guidelines.

The proposed layout of a typical access junction provided on the local road network, as well as the proposed layout of the access layout along the A90 (T), are presented in **Appendix A**.

The Construction Execution Plan (CEP), which was prepared by Stockton, is provided in **Appendix 5.1** of the **Onshore EIA Report** and outlines the main construction activities during construction. In Section 7.7 Construction Sections of the CEP information regarding the method of construction/cable laying along the route is provided. For all the crossing locations, the CEP notes that:

*"Insufficient geotechnical data at time of writing this document means that a specific trenchless methodology cannot be determined, although it is likely that HDD installation would be the initial preferred methodology, with minor crossings utilising HDD mini rigs ("Ditch Witch"), with a typical maximum install length of 350-400m. Larger crossings will be assessed and appropriate methodologies assessed."*

In addition to the above, it is noted in the CEP that open cut methods may be undertaken at RDX8 and RDX9. The CEP notes that:

*"if undertaken by opencut methods, would involve a road closure, with resultant traffic management, including diversions. Open cut operations would be undertaken by the mainline trenching crew, with trench(es) cut through the road, Ducting installed, backfilled, and a temporary running surface installed, with the final road*

*finish completed following completion of all opencut roads. Opencut of public roads for installation of infrastructure is usually reserved for minor roads and tracks. Large highways are usually installed with trenchless techniques, in order to minimise disruption.*

*Dependent upon the prevailing constraints, it may be possible to install the opencut road crossing without closing the highway for 1-2 days. It is common practice to utilise road plates and traffic control once the trench has crossed the road way, and the ducts installed."*

## 5.2 Study Area Determination

The geographic scope was determined through a review of Ordnance Survey (OS) plans and an assessment of the potential origin locations of construction staff and supply locations for construction materials.

The Study Area for this assessment includes parts of the A90 (T), A981, A952, A950, A948, A947, B9030, B9170, unnamed road at Rora Dairy, unnamed road at NGNDSS and other minor roads/tracks providing local access, such as Woodside and Tortorston Road.

The Study Area network is illustrated in Figure 3.

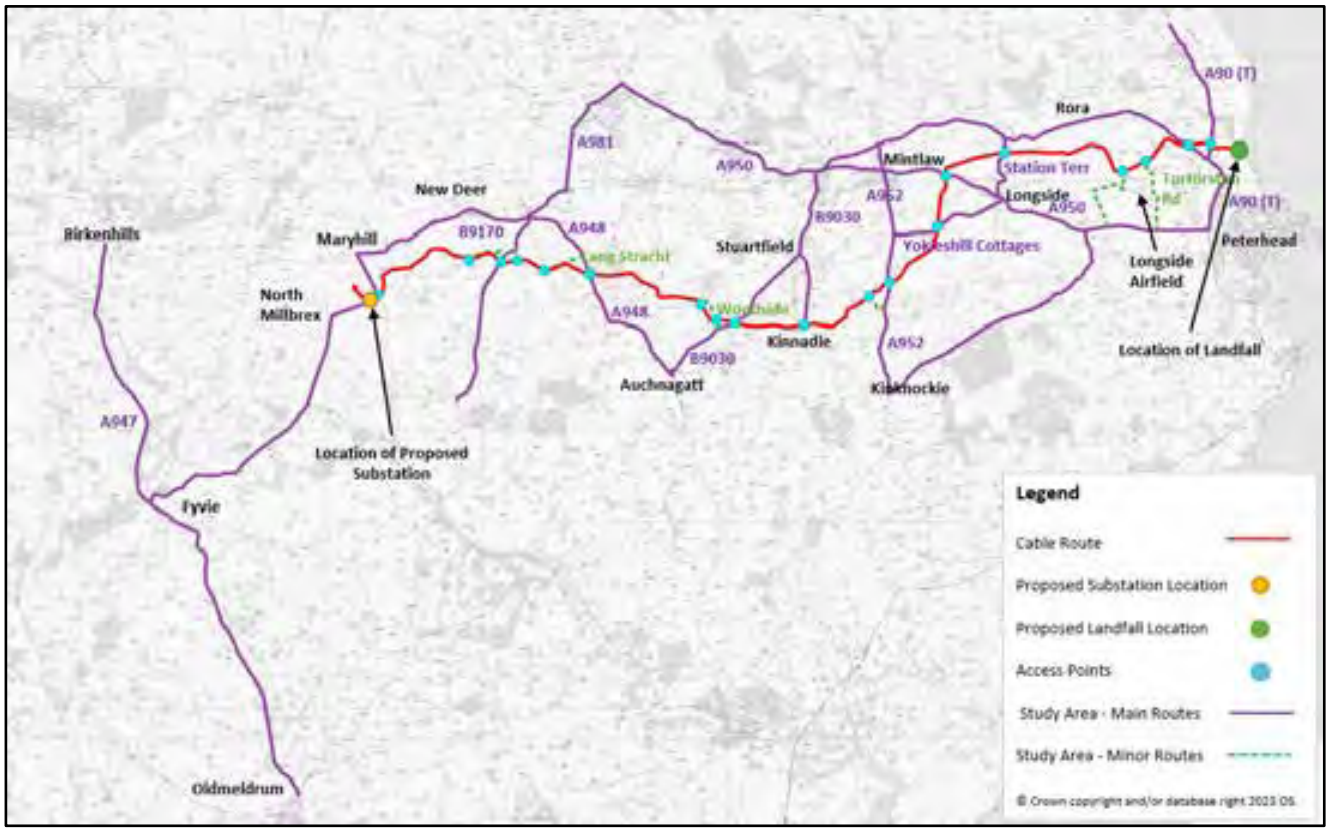


**Figure 3 Study Area**

## 5.3 Road Access

**A90 (T)**

The A90 (T) forms part of the trunk road network and provides a connection between Fraserburgh and Edinburgh. The A90 (T) is maintained by Amey on behalf of Transport Scotland. Within the Proposed Development's study area, the A90 (T) is a two-way single carriageway road and is mainly subject to the national speed limit, however, this reduces to 30 miles per hour (mph) when travelling through St Fergus. The A90 (T) appears to be mainly of a good standard, however, there are locations along the road, which shows some sign of deterioration.

**A981**

The A981 comprises a single two-way carriageway road, which provides a connection between New Deer and Fraserburgh. The A981 is maintained by Aberdeenshire Council and is mainly subject to the national speed limit, however this reduces to 30 mph when travelling through New Deer, within the study area. The A981 appears to be mainly of a good standard.

**A952**

The A952 consists of a single two-way carriageway road which provides a connection between Lonmay and Toll of Birness. The A952 is maintained by Aberdeenshire Council and appears to be of a good standard. The A952 is mainly subject to the national speed limit, however, this reduces to 30 mph or 40 mph when travelling through Mintlaw, within the study area.

**A950**

The A950 comprises a single two-way carriageway road which provides a connection between Peterhead and New Pitsligo, via Longside and Mintlaw. The A950 is maintained by Aberdeenshire Council and appears to be of a good standard. The A950 is mainly subject to the national speed limit, however, this reduces to 30 mph or 40 mph when travelling through Longside and Mintlaw, within the study area.

**A948**

The A948 comprises a single two-way carriageway road which provides a connection between Ellon and New Deer. The A948 is maintained by Aberdeenshire Council and appears to be of a good standard. The A948 is mainly subject to the national speed limit, however, this reduces to 30 mph when travelling through New Deer, within the study area.

**A947**

The A947 comprises a single two-way carriageway road which provides a connection between Aberdeen and Banff. The A947 is maintained by Aberdeenshire Council and Aberdeen Council and appears to be of mainly good standard however there are a number of locations along the road which show signs of deterioration and repair. The A947 is mainly subject to the national speed limit, however, this reduces when going through urban areas.

**B9030**

The B9030 comprises a single two-way carriageway road which provides a connection between Old Deer and Auchnagatt. The B9030 is maintained by Aberdeenshire Council and appears to be mainly of good standard however there are a small number of locations along the B9030 which show signs of deterioration. The B9030 is mainly subject to the national speed limit, however, this reduces to 30 mph when travelling through Stuartfield and Auchnagatt, within the study area.

**B9170**

The B9170 consists of a single two-way carriageway road which provides a connection between Methlick and New Deer. The B9170 is maintained by Aberdeenshire Council, and appears to be mainly of a good standard, however, there are a small number of signs of deterioration along the B9170 within the study area. The B9170 is mainly subject to the national speed limit, however, this reduces to 30 mph when travelling through New Deer, within the study area.

**Unnamed Road, at Rora Dairy**

The unnamed road at Rora Dairy consists of a single two-way carriageway road which provides a connection between A90 (T) and Millbank. The unnamed road is maintained by Aberdeenshire Council, and appears to be mainly of a good standard. The unnamed road is mainly subject to the national speed limit.

**Unnamed Road, at NGNDSS**

The unnamed road, at NGNDSS, comprises a single two-way carriageway road and is maintained by Aberdeenshire Council. The unnamed road contains passing places, and shows evidence of deterioration and previous repair. The unnamed road is subject to the national speed limit.

**Minor Routes**

There are a number of roads which provide access to the Proposed Development and are shown previously in Figure 3 as Minor Routes. These Minor Routes include Woodside, Tortorston Road and Lang Stracht. The Minor Routes roads are mainly subject to the national speed limit, however, there is a section of Tortorston Road which is subject to a 30 mph speed limit.

**Timber Routes**

A number of the roads within the Study Area form part of the agreed route network used for the extraction of timber and are therefore regularly used by HGV traffic. This includes the A82(T) and A87(T) which are ‘Agreed Routes’ and the U1667 Ardachy Road, which is a ‘Consultation Route’.

The Agreed Timber Route Map has been developed by The Timber Transport Forum who are a partnership of the forestry and timber industries, local government, national government agencies, timber hauliers and road and freight associations. One of the key aims of the forum is to minimise the impact of timber transport on the public road network, on local communities and the environment and a way of achieving this is to categorise the roads leading to forest areas in terms of their capacity to sustain the likely level of timber haulage vehicles i.e., HGVs. The routes are categorised into four groups, namely; ‘Agreed Routes’, ‘Consultation Routes’, ‘Severely Restricted Routes’ and ‘Excluded Routes’.

‘Agreed Routes’ are categorised as routes used for timber haulage without restriction as regulated by the Road Traffic Act 1988. A-roads are classified as ‘Agreed Routes’ by default unless covered by one of the other road classifications. Those links classed as ‘Consultation Routes’ are categorised as a route which is key to timber extraction, but which are not up to ‘Agreed Route’ standard. Consultation with the local authority is required, and it may be necessary to agree limits of timing, allowable tonnage etc. before the route can be used. B-roads are classified as ‘Consultation Routes’ by default unless covered by one of the other classifications. ‘Severely Restricted Routes’ are not normally to be used for timber transport in their present condition. These routes are close to being Excluded Routes. Consultation with the local authority is required prior to use. Finally, ‘Excluded Routes’ should not be used for timber transport in their present condition. These routes are either formally restricted, or are close to being formally restricted, to protect the network from damaging loads.

## 5.4 Accident Information

Road traffic accident data within the Study Area for the five-year period commencing 01 January 2017 through to the 31 December 2021 was obtained from the online resource crashmap.co.uk[2] which uses data collected by the police about road traffic crashes occurring on British roads.

TA Guidance[3] requires an analysis of the Personal Injury Accident (PIA) information on the road network in the vicinity of any development to be undertaken for at least the most recent 3-year period, or preferably a 5-year period, particularly if the site has been identified as being within a high accident area.

The statistics are categorised into three categories, namely “Slight” for damage only incidents, “Serious” for injury accidents and “Fatal” for accidents that result in a death.

The locations of the recorded accidents within the study area are presented in Figure 4.

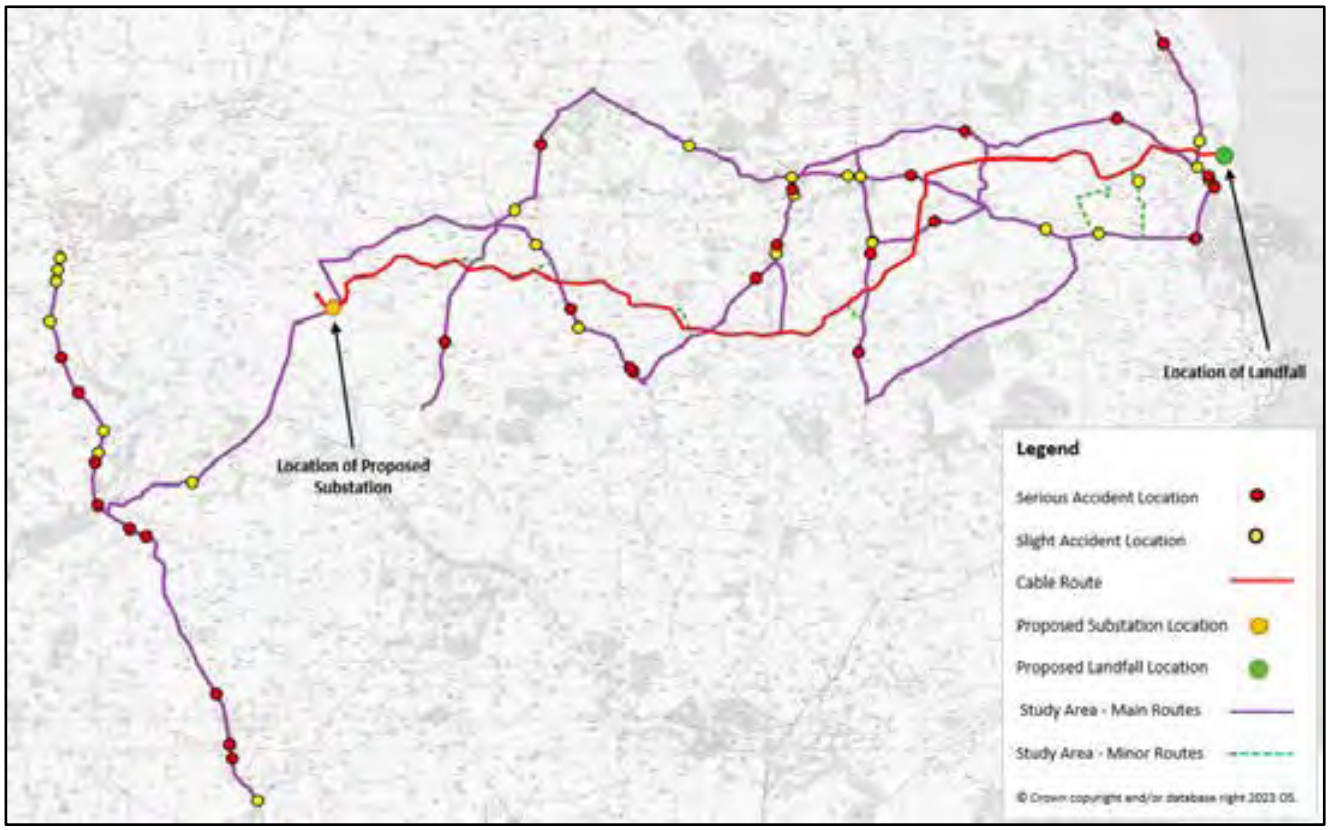


**Figure 4 Accident Locations**

A summary analysis of the incidents indicates that:

- A total of 55 accidents were recorded within the Study Area during the study period, of which, 28 were classified as slight and 27 were classified as serious. No fatalities were recorded within the Study Area.
- A total of 52 accidents involved cars, five accidents involved motorcycles, seven accidents involved HGVs and two accidents involved pedestrians. A total of 18 accidents involved young drivers.
- Two separate incidents involved young pedestrians in Mintlaw, which were both classified as slight. One incident was recorded at the A950 / Newlands Road priority junction and one incident was recorded on the western arm of the roundabout at The Square.
- A total of three separate incidents were recorded within a distance of 100 m along the A90 (T), at the bridge over River Ugie. The road in the vicinity of the bridge is winding in nature. One of the incidents

[2] https://www.crashmap.co.uk/
[3] https://www.transport.gov.scot/media/4589/planning_reform_-_dpmtag_-_development_management__dpmtag_ref__17__-_transport_assessment_guidance_final_-_june_2012.pdf

involved a motorcycle, one incident was recorded as a single-vehicle accident involving a car, and one incident involved two cars. The two separate incidents involving cars were classified as slight and the incident involving a motorcycle was classified as serious.

- Two separate accidents were recorded in the same location along the A947, approximately 600 m to the south of Birkenhills. Both were classified as slight and were recorded as multi-vehicle collisions involving cars. There is a slight bend along the A947 in the vicinity of the area where the accidents were recorded.

In general, there are no clusters of PIAs at any location in the study area or high numbers of accidents involving HGVs for example. Based on the information available, it has been established that there are no specific road safety issues within the immediate vicinity of the Proposed Development that currently require to be addressed or would be exacerbated by the construction of the Proposed Development.

## 5.5 Pedestrian and Cyclist Networks

A review of the Core Paths Plan[4] on the Aberdeenshire Council website indicates that the following Core Paths detailed in Table 2 are located within the vicinity of the Proposed Development or cross the roads within the study area.

**Table 2 Core Paths in the vicinity of the Proposed Development**

| Path No. | Location | Path Type | Length (km) |
|---|---|---|---|
| 7LD.03MP.05 | The path crosses the Minor Routes at Glendaveny Cottages and Tortorston Road. | Existing Core Path | 7.29 |
| 7LD.03MP.04 | The Proposed Development crosses the path north of Crookedneuk | Existing Core Path | 3.84 |
| 208.01 | The path crosses Yokieshill Cottages within the study area. | Existing Core Path | 1.47 |
| 7LD.03FM.10 | The Proposed Development crosses the path at Capelstones | Existing Core Path | 13.41 |

A review of Sustrans' National Cycle Network (NCN) map indicates that a section of NCN Route 1 is located along the Proposed Development's route. NCN Route 1 comprises a combination of on-road and traffic-free cycle route which runs from Dover to Tain and is approximately 2,034 kilometres (km) in length.

The section of NCN Route 1 which is located in the vicinity of the Proposed Development comprises a traffic free route and is located between Auchnagatt and Maud.

Within the study area, NCN Route 1 is required to cross the A981 on a section of the on-road route to the northwest of Maud.

## 5.6 Existing Traffic Conditions

In order to assess the impact of construction traffic within the study area, Automatic Traffic Count (ATC) surveys were undertaken along the unnamed road, at NGNDSS, B9030 northeast of Auchnagatt, A952, Millbreck and A950, east of Mintlaw, between 07 and 13 June 2023. These provide a robust review of all major links around the study network.

The ATC surveys were complimented with existing traffic data obtained from the Department for Transport (DfT) database. Available traffic data from 2019 was used to estimate existing traffic flows, as this data was not affected by Covid 19 travel restrictions. National Road Traffic Forecasts (NRTF) low growth factors were applied to the 2019 data to estimate 2023 flows. The low growth factor for 2019 to 2023 is 1.027.

[4] Available at: https://gis.aberdeenshire.gov.uk/maps/Map.aspx?MapName=Paths&baselayer=OS%20Greyscale

The traffic count locations are as presented in Figure 5 and are described as follows:

1. Unnamed Road, at NGNDSS (ATC);
2. B9170, south of New Deer (DfT 983081);
3. A981, Fordyce Terrace, New Deer (DfT 21004);
4. A948, southeast of New Deer (DfT 1180);
5. A948, north of Nethermuir (DfT 50860);
6. B9030, northeast of Auchnagatt (ATC);
7. A952, Millbreck (ATC);
8. A950, northwest of Old Deer (DfT 20990);
9. A950, east of Mintlaw (ATC);
10. Unnamed Road, at Rora Dairy (DfT 931840);
11. A90, St Fergus (DfT 50805);
12. A90, north of Howe o'Buchan Roundabout (DfT 80573);
13. A947, Birkenhills (DfT 30993); and
14. A947, Tulloch (DfT 84078).


**Figure 5 Traffic Count Location Points**

Traffic count data for 2019 was obtained from the count site information. The 2019 traffic data was then factored to 2023 traffic data by applying a National Road Traffic Forecast (NRTF) low growth. The NRTF low growth factor for 2019 to 2023 is 1.027.

The traffic count data allowed the traffic flows to be split into vehicle classes and the data has been summarised into cars / Light goods vehicles (LGV) and heavy goods vehicles (HGVs) (i.e. all goods vehicles >3.5 tonnes gross maximum weight).

A summary of the 24-hour average daily traffic for each of the count sites is presented in Table 3.

**Table 3 24-hour Average Daily Traffic Data (2023)**

| Site Ref. | Survey Location | Cars & LGV | HGV | Total |
|---|---|---|---|---|
| 1 | Unnamed Road, at NGNDSS | 225 | 100 | 325 |
| 2 | B9170, south of New Deer | 1,562 | 161 | 1,723 |
| 3 | A981, Fordyce Terrace, New Deer | 2,738 | 194 | 2,932 |
| 4 | A948, southeast of New Deer | 853 | 92 | 946 |
| 5 | A948, north of Nethermuir | 1,781 | 146 | 1,927 |
| 6 | B9030, northeast of Auchnagatt | 460 | 102 | 562 |
| 7 | A952, Millbreck | 5,108 | 1,245 | 6,353 |
| 8 | A950, northwest of Old Deer | 2,176 | 261 | 2,437 |
| 9 | A950, east of Mintlaw | 5,743 | 904 | 6,647 |
| 10 | Unnamed Road, at Rora Dairy | 528 | 23 | 550 |
| 11 | A90, St Fergus | 4,546 | 267 | 4,813 |
| 12 | A90, north of Howe o'Buchan Roundabout | 3,740 | 413 | 4,153 |
| 13 | A947, Birkenhills | 5,852 | 534 | 6,386 |
| 14 | A947, Tulloch | 5,142 | 614 | 5,756 |

The two-way seven-day average and 85$^{th}$ percentile speeds observed at the count sites are summarised below in Table 4.

**Table 4 Speed Summary (2023)**

| Site Ref. | Survey Location | Mean Speed (mph) | 85th %ile Speed (mph) | Speed Limit (mph) |
|---|---|---|---|---|
| 1 | Unnamed Road, at NGNDSS | 46.5 | 57.8 | 60.0 |
| 2 | B9170, south of New Deer | No Data Available | | 60.0 |
| 3 | A981, Fordyce Terrace, New Deer | | | 30.0 |
| 4 | A948, southeast of New Deer | | | 60.0 |
| 5 | A948, north of Nethermuir | | | 60.0 |
| 6 | B9030, northeast of Auchnagatt | 47.5 | 58.5 | 60.0 |
| 7 | A952, Millbreck | 57.8 | 65.9 | 60.0 |
| 8 | A950, northwest of Old Deer | No Data Available | | 60.0 |
| 9 | A950, east of Mintlaw | 49.8 | 58.4 | 60.0 |
| 10 | Unnamed Road, at Rora Dairy | No Data Available | | 60.0 |
| 11 | A90, St Fergus | | | 40.0 |
| 12 | A90, north of Howe o'Buchan Roundabout | | | 60.0 |
| 13 | A947, Birkenhills | | | 50.0 |
| 14 | A947, Tulloch | | | 60.0 |

The speed information shown in Table 4 indicates that there is compliance with the current speed limit at the ATC survey locations, with the exception of A952, Millbreck. This indicates that traffic management measures may be required at this location and that Police Scotland may wish to consider enforcement spot checks in this area as part of their wider road policing measures.

## 5.7 Future Traffic Conditions

Construction of the Proposed Development could commence in 2025, if consent is granted, and is anticipated to take up to 30 months depending on weather conditions and ecological constraints.

To assess the likely effects during the construction and typical operational phase, base year traffic flows were determined by applying a NRTF low growth factor to the surveyed traffic flows.

The NRTF low growth factor for 2023 to 2025 is 1.011. These factors were applied to the 2023 traffic data in Table 2 to estimate the 2025 Baseline traffic flows shown in Table 5.

**Table 5 24-hour Average Daily Traffic Data (2025)**

| No. | Survey Location | Cars & LGV | HGV | Total |
|---|---|---|---|---|
| 1 | Unnamed Road, at NGNDSS | 227 | 101 | 329 |
| 2 | B9170, south of New Deer | 1,579 | 163 | 1,742 |
| 3 | A981, Fordyce Terrace, New Deer | 2,768 | 196 | 2,964 |
| 4 | A948, southeast of New Deer | 863 | 93 | 956 |
| 5 | A948, north of Nethermuir | 1,800 | 147 | 1,948 |
| 6 | B9030, northeast of Auchnagatt | 465 | 103 | 568 |
| 7 | A952, Millbreck | 5,164 | 1,259 | 6,423 |
| 8 | A950, northwest of Old Deer | 2,200 | 264 | 2,464 |
| 9 | A950, east of Mintlaw | 5,806 | 914 | 6,720 |
| 10 | Unnamed Road, at Rora Dairy | 534 | 23 | 557 |
| 11 | A90, St Fergus | 4,596 | 270 | 4,865 |
| 12 | A90, north of Howe o'Buchan Roundabout | 3,781 | 417 | 4,199 |
| 13 | A947, Birkenhills | 5,916 | 540 | 6,456 |
| 14 | A947, Tulloch | 5,199 | 621 | 5,820 |

Please note minor variances due to rounding may occur.

# 6 Trip Generation and Distribution

## 6.1 Construction Phase

### 6.1.1 Trip Derivations

Average monthly traffic flow data was used to establish the construction trips associated with the Proposed Development. The Applicant has undertaken a preliminary design of the Proposed Development and PF have estimated traffic movements based upon experience from similar projects.

It should be noted that as the assessment is based upon an indicative construction programme for the Proposed Development, alterations in this programme may increase or decrease traffic flows per month.

Daily construction traffic estimates have been developed and are detailed in Appendix B. The peak of construction activity occurs in Month 5 of the programme and results in 464 daily movements (232 inbound and 232 outbound movements per day). Of these 464 daily movements, 396 movements are associated with HGV moving equipment to mobilise sections of the works as well as the import of track building materials from local quarries and the construction of the Substation and Landfall elements. The remaining 68 movements are associated with construction staff arriving at and departing from the Site.

## 6.2 Distribution of Construction Trips

Materials for the construction of the access tracks are assumed to be sourced from local quarries, the closest of which are located near Methlick and the closest concrete plant is located near Thunderton.

The construction supply contracts have not yet been let and the Applicant will confirm exact sources of material with the Council prior to construction works commencing.

To allow the Offshore Project to connect to the national electrical grid, new transformers will be required. These transformers will be located within the Substation Compound and due to their size and weight are classified as Abnormal Indivisible Loads (AILs). These will be delivered to the Substation Compound from Port of Peterhead via the A982, A90 (T), A948, B9170, the unnamed road leading to Greens / Maryhill and the unnamed road between Maryhill and North Millbrex where the Substation Compound access will be located. The proposed delivery route is shown in Figure 6.

**Figure 6 Proposed AIL Delivery Route**

Further details regarding the route proposed improvements to facilitate the delivery of the AILs are provided in the Abnormal Load Route Survey Report (RSR) provided in Appendix C.

Equipment and materials to mobilise the Site will be transported to the Site via the A90 (T). Construction staff will be based locally to the Site.

The peak construction traffic flows have been distributed based on assumed origins of materials and staff, and it has been assumed that cable route trips will occur at each access point as a worst-case scenario, as at the time of writing the construction programme is indicative and therefore it is not yet known which section of the cable route will be constructed during the peak month. The peak construction traffic flows are presented in Table 6.

**Table 6 Peak Construction Traffic Flows**

| No. | Survey Location | Cars & LGV | HGV | Total |
|---|---|---|---|---|
| 1 | Unnamed Road, at NGNDSS | 57 | 372 | 429 |
| 2 | B9170, south of New Deer | 39 | 354 | 393 |
| 3 | A981, Fordyce Terrace, New Deer | 39 | 311 | 350 |
| 4 | A948, southeast of New Deer | 39 | 293 | 332 |
| 5 | A948, north of Nethermuir | 39 | 293 | 332 |
| 6 | B9030, northeast of Auchnagatt | 39 | 293 | 332 |
| 7 | A952, Millbreck | 39 | 293 | 332 |
| 8 | A950, northwest of Old Deer | 39 | 311 | 350 |
| 9 | A950, east of Mintlaw | 39 | 306 | 346 |
| 10 | Unnamed Road, at Rora Dairy | 39 | 297 | 336 |
| 11 | A90, St Fergus | 10 | 0 | 10 |
| 12 | A90, north of Howe o'Buchan Roundabout | 21 | 321 | 342 |
| 13 | A947, Birkenhills | 38 | 0 | 38 |
| 14 | A947, Tulloch | 0 | 0 | 0 |

Please note minor variances due to rounding may occur.

## 6.3 Decommissioning Phase

Prior to decommissioning of the Proposed Development, a traffic assessment would be undertaken and appropriate traffic management procedures followed.

The decommissioning phase would result in fewer trips on the road network than the construction or operational phases as it is considered likely that elements of infrastructure such as cables would be left in place.

# 7 Traffic Impact Assessment

## 7.1 Construction Impact – 2025 Baseline Flows

The peak month traffic data was combined with the future year (2025) traffic data to allow a comparison between the baseline results to be made. The increase in traffic volumes is shown as percentage increases for each class of vehicle in Table 7.

**Table 7 2025 Peak Month Daily Traffic Data**

| No. | Survey Location | Cars & LGV | HGV | Total | Cars & LGV % Increase | HGV % Increase | Total % Increase |
|---|---|---|---|---|---|---|---|
| 1 | Unnamed Road, at NGNDSS | 285 | 473 | 758 | 25.2% | 368.2% | 130.7% |
| 2 | B9170, south of New Deer | 1,619 | 517 | 2,136 | 2.5% | 217.3% | 22.6% |
| 3 | A981, Fordyce Terrace, New Deer | 2,807 | 507 | 3,314 | 1.4% | 158.4% | 11.8% |
| 4 | A948, southeast of New Deer | 902 | 386 | 1,288 | 4.6% | 313.4% | 34.7% |
| 5 | A948, north of Nethermuir | 1,840 | 440 | 2,280 | 2.2% | 198.6% | 17.1% |
| 6 | B9030, northeast of Auchnagatt | 504 | 396 | 900 | 8.4% | 284.0% | 58.5% |
| 7 | A952, Millbreck | 5,203 | 1,552 | 6,755 | 0.8% | 23.3% | 5.2% |
| 8 | A950, northwest of Old Deer | 2,239 | 575 | 2,814 | 1.8% | 117.9% | 14.2% |
| 9 | A950, east of Mintlaw | 5,845 | 1,220 | 7,066 | 0.7% | 33.5% | 5.1% |
| 10 | Unnamed Road, at Rora Dairy | 573 | 320 | 893 | 7.4% | 1301.1% | 60.5% |
| 11 | A90, St Fergus | 4,605 | 270 | 4,875 | 0.2% | 0.0% | 0.2% |
| 12 | A90, north of Howe o'Buchan Roundabout | 3,802 | 739 | 4,541 | 0.5% | 76.9% | 8.1% |
| 13 | A947, Birkenhills | 5,954 | 540 | 6,494 | 0.6% | 0.0% | 0.6% |
| 14 | A947, Tulloch | 5,199 | 621 | 5,820 | 0.0% | 0.0% | 0.0% |

Please note minor variances due to rounding may occur.

The total traffic movements are anticipated to increase by over 30% at the unnamed road, at NGNDSS (130.7% increase), the A948, southeast of New Deer (34.7% increase), the B9030, northeast of Auchnagatt (58.5% increase) and the unnamed road, at Rora Dairy (60.5%). The traffic flows are expected to increase by 429, 332, 332 and 336 daily two-way movements, respectively, which sees an hourly increase of approximately 36, 28, 28 and 28 trips per hour, respectively or approximately two trips per minute on each of the road links.

HGV trips are expected to increase by over 30% on the following links, described as follows:

- Count Point 1. Unnamed road, at NGNDSS (368.2% increase) which sees an increase in HGVs by 372 HGVs per day which equates to approximately 31 HGV trips per hour (16 inbound HGV trips and 15 outbound HGV trips);
- Count Point 2. B9170, south of New Deer (217.3% increase) which sees an increase in HGVs by 354 HGVs per day which equates to approximately 30 HGV trips per hour (approximately 15 inbound HGV trips and 15 outbound trips);
- Count Point 3. A981, Fordyce Terrace, New Deer (158.4% increase) which sees an increase in HGVs by 311 HGVs per day which equates to approximately 26 trips per hour (approximately 13 inbound HGV trips and 13 outbound HGV trips);
- Count Point 4. A948, south-east of New Deer (313.4% increase) which sees an increase in HGVs by 293 HGVs per day which equates to approximately 24 trips per hour (12 inbound HGV trips and 12 outbound HGV trips);

- Count Point 5. A948, north of Nethermuir (198.6% increase) which sees an increase in HGVs by 293 HGVs per day which equates to approximately 24 trips per hour (12 inbound HGV trips and 12 outbound HGV trips);
- Count Point 6. B9030, northeast of Auchnagatt (284.0% increase) which sees an increase in HGVs by 293 HGVs per day which equates to approximately 24 trips per hour (12 inbound HGV trips and 12 outbound HGV trips);
- Count Point 8. A950, northwest of Old Deer (117.9% increase) which sees an increase in HGVs by 311 HGVs per day which equates to approximately 26 trips per hour (approximately 13 inbound HGV trips and 13 outbound HGV trips);
- Count Point 9. A950, east of Mintlaw (33.5% increase) which sees an increase in HGVs by 306 HGVs per day which equates to approximately 26 trips per hour (approximately 13 inbound HGV trips and 13 outbound HGV trips);
- Count Point 10. Unnamed road, at Rora Dairy (1301.1% increase) which sees an increase in HGVs by 297 HGVs per day which equates to approximately 25 trips per hour (13 inbound HGV trips and 12 outbound HGV trips); and
- Count Point 12. A90, north of Howe o'Buchan Roundabout (76.9% increase) which sees an increase in HGVs by 321 HGVs per day which equates to approximately 27 trips per hour (14 inbound HGV trips and 13 outbound HGV trips).

While the increases are statistically significant, it is generally caused by low total flows as well as low HGV flows on roads within the study area. The increases in total and HGV flows detailed above are not considered significant in terms of overall total flows. It should also be noted the construction phase is transitory in nature and the peak of construction activities is short- lived.

A review of existing road capacity has been undertaken using the *Design Manual for Roads and Bridges*, Volume 15, Part 5 “The NESA Manual”. The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the Study Area. The results are summarised in Table 8.

**Table 8 2025 Daily Traffic Data (12 hr)**

| No. | Survey Location | 2025 Baseline Flow | 2025 Base + Development Flows | Theoretical Road Capacity | Spare Road Capacity % |
|---|---|---|---|---|---|
| 1 | Unnamed Road, at NGNDSS | 329 | 758 | 3,360 | 77% |
| 2 | B9170, south of New Deer | 1,742 | 2,136 | 21,600 | 90% |
| 3 | A981, Fordyce Terrace, New Deer | 2,964 | 3,314 | 19,200 | 83% |
| 4 | A948, southeast of New Deer | 956 | 1,288 | 21,600 | 94% |
| 5 | A948, north of Nethermuir | 1,948 | 2,280 | 21,600 | 89% |
| 6 | B9030, northeast of Auchnagatt | 568 | 900 | 19,200 | 95% |
| 7 | A952, Millbreck | 6,423 | 6,755 | 21,600 | 69% |
| 8 | A950, northwest of Old Deer | 2,464 | 2,814 | 21,600 | 87% |
| 9 | A950, east of Mintlaw | 6,720 | 7,066 | 21,600 | 67% |
| 10 | Unnamed Road, at Rora Dairy | 557 | 893 | 3,360 | 73% |
| 11 | A90, St Fergus | 4,865 | 4,875 | 28,800 | 83% |
| 12 | A90, north of Howe o'Buchan Roundabout | 4,199 | 4,541 | 28,800 | 84% |
| 13 | A947, Birkenhills | 6,456 | 6,494 | 28,800 | 77% |
| 14 | A947, Tulloch | 5,820 | 5,820 | 28,800 | 80% |

Please note minor variances due to rounding may occur.

The results indicate there are no road capacity issues with the combined development and ample spare capacity exists within the trunk and local road network to accommodate construction phase traffic.

## 7.2 Committed Development

A review of surrounding developments on the Aberdeenshire Planning Portal has been undertaken which found a number of consented (i.e. committed developments) proposals in the surrounding area. These are noted in Table 9.

**Table 9 Committed Developments**

| Planning Reference | Location | Description | Comments |
|---|---|---|---|
| APP/2021/2089 | Land at Meldrum House Estate, Oldmeldrum | Erection of 34 dwellings | No trip information. Assumed that trips are accounted for in the NRTF growth factors. |
| APP/2019/0175 | Land to the west of St Katherines, Fyvie | Erection of 15 dwellings | No trip information. Assumed that trips are accounted for in the NRTF growth factors. |
| APP/2020/2098 | Crichie Meadows, Stuartfield | Erection of 19 dwellings | No trip information. Assumed that trips are accounted for in the NRTF growth factors. |
| APP/2019/0919 | Sherwood Place, New Deer | Care Resource Centre | The application includes the number of parking spaces however there is no detailed trip and distribution information available. It is assumed that trips are accounted for in the NRTF growth factors. |
| APP/2018/1982 | Hillhead of Auchreddie, New Deer | Continued Operation of Waste Recycling Centre | Trips associated with the Waste Recycling Centre are already assumed to be on the road network. |
| APP/2020/0897 | Longside | Bridgend Quarry Longside | The associated Planning Statement notes that it is anticipated that there will be approximately 4 HGV movements every 3 hours which is expected to have a negligible impact on the road network. It is assumed that trips are accounted for in the NRTF growth factors. |
| APP/2016/1606 | Balring Road, Mintlaw | Northwoods Housing Development | Associated Transport Assessment suggests that total AM trips will equate to 56 trips and total PM trips will equate to 61 trips. There are no traffic flow diagrams or TRICS outputs are not provided in the Appendix of the Transport Assessment. It is assumed that trips are accounted for in the NRTF growth factors. |
| APP/2022/0293 | Land adjacent to Mintlaw Industrial Estate, Station Road, Mintlaw | Erection of Commercial Unit Class 4 (Business), 5 (General Industrial) and 6 (Storage or Distribution) | No Transport Assessment available. Assumed that trips are accounted for in the NRTF growth factors. |
| APP/2016/3352 | Land at Aden Park Estate, Station Road, Mintlaw | Erection of 73 Dwellinghouses and Associated Infrastructure | A Transport Statement was provided as part of the planning submission including TRICS outputs. While there were no flow diagrams provided as part of the submission, the Transport Statement noted that *"Development traffic would therefore be split across two junctions on the A950 and would subsequently split again across a number of routes from the town centre".*<br><br>These trips will be included along the A950 as Committed Development Flows in the Future Baseline Flows. |
| APP/2017/2547 | Nether Aden, Mintlaw | Mixed Use Development - Erection of 500 Dwellinghouse, Business, Community, Services for the Elderly, Retail and 5Ha of Employment Land | Construction has commenced on the site and a small number of dwellings appear occupied. Flow diagrams for the AM and PM peak period flows showing junctions on the local road network are presented in the Transport Assessment as well as the AM and PM peak hours for traffic at the A952 / A90 junction and the A90 / A950 roundabout. |

| Planning Reference | Location | Description | Comments |
|---|---|---|---|
| | | | These trips will be included as Committed Development Flows in the Future Baseline Flows. |
| APP/2021/1712 | Land at Kirkton Approximately 1.2km Southeast of St Fergus Village | Erection of Solar PV Farm of 50MW Capacity and a Battery Energy Storage Facility of 20MW Capacity with Ancillary Development | A review of the associated Transport Statement suggests that the maximum trips per days would equate to 36 movements which is not significant in relation to trunk road trips, of which 29 would be travelling to / from A90 (T) – South and 7 would be traveling to / from A90 (T) North. These numbers of trips are not significant in terms of flows on the trunk road network, it is therefore assumed that these trips would be accounted for in the NRTF growth factors. |
| APP/2020/0227 | Site Newton Road, St Fergus | Erection of 20 Dwellinghouses and Associated Infrastructure | Some of the dwellings appear to be occupied, and construction appears to be taking place on the remaining parts of the site. There is no trip information associated with the development, and it is assumed that trips are accounted for in the NRTF growth factors. |
| APP/2019/2653 | Land Adjacent to the St Fergus Gas Terminal, St Fergus | Erection of 2 Wind Turbines (Hub Height 78m, 119m to Blade Tip), a 5MWp Solar Photovoltaic Farm, Battery Storage Units and Associated Infrastructure | No Transport Statement was undertaken as part of the planning submission as it was noted in the Environmental Impact Assessment Report that: *"Environmental Health were consulted further as to the requirement for a Transport Statement (TS) to be included in the NIA. This was scoped out following agreement that construction traffic was unlikely to increase baseline flows by more than 30% (the relevant threshold of significance) in any category or in total."* It is therefore assumed that trips are accounted for in the NRTF growth factors. |
| APP/2019/2300 | Land Adjacent To The St Fergus Gas Terminal St Fergus | National for Erection of Electricity Substation Comprising Platform Area, Control Building, Associated Plant and Infrastructure, Ancillary Facilities, Access Track and Landscape Works | No trip information. Assumed that trips are accounted for in the NRTF growth factors. |

## 7.3 Construction Impact – 2025 Baseline plus Committed Development Flows

The peak month traffic data was combined with the future year (2025) traffic data plus committed development flows to allow a comparison between the baseline results to be made. The increase in traffic volumes is shown as percentage increases for each class of vehicle in Table 10.

**Table 10 2025 plus Committed Development Flows Peak Month Daily Traffic Data**

| No. | Survey Location | Cars & LGV | HGV | Total | Cars & LGV % Increase | HGV % Increase | Total % Increase |
|---|---|---|---|---|---|---|---|
| 1 | Unnamed Road, at NGNDSS | 285 | 473 | 758 | 25.2% | 368.2% | 130.7% |
| 2 | B9170, south of New Deer | 1,619 | 517 | 2,136 | 2.5% | 217.3% | 22.6% |
| 3 | A981, Fordyce Terrace, New Deer | 2,807 | 507 | 3,314 | 1.4% | 158.4% | 11.8% |
| 4 | A948, southeast of New Deer | 902 | 386 | 1,288 | 4.6% | 313.4% | 34.7% |
| 5 | A948, north of Nethermuir | 1,840 | 440 | 2,280 | 2.2% | 198.6% | 17.1% |

| No. | Survey Location | Cars & LGV | HGV | Total | Cars & LGV % Increase | HGV % Increase | Total % Increase |
|---|---|---|---|---|---|---|---|
| 6 | B9030, northeast of Auchnagatt | 504 | 396 | 900 | 8.4% | 284.0% | 58.5% |
| 7 | A952, Millbreck | 6,980 | 1,552 | 8,531 | 0.6% | 23.3% | 4.1% |
| 8 | A950, northwest of Old Deer | 4,679 | 575 | 5,254 | 0.8% | 117.9% | 7.1% |
| 9 | A950, east of Mintlaw | 7,517 | 1,220 | 8,737 | 0.5% | 33.5% | 4.1% |
| 10 | Unnamed Road, at Rora Dairy | 573 | 320 | 893 | 7.4% | 1301.1% | 60.5% |
| 11 | A90, St Fergus | 4,605 | 270 | 4,875 | 0.2% | 0.0% | 0.2% |
| 12 | A90, north of Howe o'Buchan Roundabout | 3,956 | 739 | 4,695 | 0.5% | 76.9% | 7.9% |
| 13 | A947, Birkenhills | 5,954 | 540 | 6,494 | 0.6% | 0.0% | 0.6% |
| 14 | A947, Tulloch | 5,199 | 621 | 5,820 | 0.0% | 0.0% | 0.0% |

Please note minor variances due to rounding may occur.

As per the traffic impacts in Table 7, which do not include committed development flows, the total traffic movements are anticipated to increase by over 30% at the unnamed road, at NGNDSS, (130.7% increase), A948, southeast of New Deer (34.7%), the B9030, northeast of Auchnagatt (58.5% increase) and the unnamed road, at Rora Dairy (60.5%). The traffic flows are expected to increase by 429, 332, 332 and 336 daily two-way movements, respectively. In terms of increases per hour, this equates to an hourly increase of approximately 36, 28, 28 and 28 trips per hour, respectively or approximately two trips per minute on each of the road links.

The increase in total flows is less on the following links, than at the baseline trips which don't include any committed development flows as in Table 8:

- 7. A952, Millbreck (reduced from 5.2% to 4.1%);
- 8. A950, northwest of Old Deer (reduced from 14.2% to 7.1%);
- 9. A950, east of Mintlaw (reduced from 5.1% to 4.1); and
- 12. A90, north of Howe o'Buchan Roundabout (reduced from 8.1% to 7.9%).

The HGV trips expected to increase by over 30% correspond to those outlined in Table 7.

A review of existing road capacity has been undertaken using the *Design Manual for Roads and Bridges*, Volume 15, Part 5 "The NESA Manual". The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the Study Area. The results are summarised in Table 11.

**Table 11 2025 plus Committed Development Flows Daily Traffic Data (12 hr)**

| No. | Survey Location | 2025 plus Committed Development Baseline Flows | 2025 Base + CD + Development Flows | Theoretical Road Capacity | Spare Road Capacity % |
|---|---|---|---|---|---|
| 1 | Unnamed Road, at NGNDSS | 329 | 758 | 3,360 | 77% |
| 2 | B9170, south of New Deer | 1,742 | 2,136 | 21,600 | 90% |
| 3 | A981, Fordyce Terrace, New Deer | 2,964 | 3,314 | 19,200 | 83% |
| 4 | A948, southeast of New Deer | 956 | 1,288 | 21,600 | 94% |
| 5 | A948, north of Nethermuir | 1,948 | 2,280 | 21,600 | 89% |
| 6 | B9030, northeast of Auchnagatt | 568 | 900 | 19,200 | 95% |
| 7 | A952, Millbreck | 8,199 | 8,531 | 21,600 | 61% |
| 8 | A950, northwest of Old Deer | 4,904 | 5,254 | 21,600 | 76% |
| 9 | A950, east of Mintlaw | 8,392 | 8,737 | 21,600 | 60% |
| 10 | Unnamed Road, at Rora Dairy | 557 | 893 | 3,360 | 73% |

| No. | Survey Location | 2025 plus Committed Development Baseline Flows | 2025 Base + CD + Development Flows | Theoretical Road Capacity | Spare Road Capacity % |
|---|---|---|---|---|---|
| 11 | A90, St Fergus | 4,865 | 4,875 | 28,800 | 83% |
| 12 | A90, north of Howe o'Buchan Roundabout | 4,353 | 4,695 | 28,800 | 84% |
| 13 | A947, Birkenhills | 6,456 | 6,494 | 28,800 | 77% |
| 14 | A947, Tulloch | 5,820 | 5,820 | 28,800 | 80% |

Please note minor variances due to rounding may occur.

The results indicate there are no road capacity issues with the combined developments and ample spare capacity exists within the trunk and local road network to accommodate construction phase traffic.

## 7.4 Conclusion

The above clearly shows that there is ample spare capacity on the road network with the addition of committed development flows and construction trips associated with the Proposed Development.

However, in order to provide a robust assessment within EIA **Chapter 13 - Traffic and Transport** impact assessments, it is proposed that the 2025 Baseline flows (Table 7) without the committed developments will be used. This has been done to ensure that potential impact of the Proposed Development has been considered in full and not diluted, for example, if trips associated with the committed developments were not on the network at the time of construction.

# 8 Framework Traffic Management Measures

## 8.1 Construction Phase

The following measures would be implemented through a Construction Traffic Management Plan (CTMP) during the construction phase. The CTMP would be agreed with Aberdeenshire Council prior to construction works commencing:

- Deliveries to Site shall be scheduled to the normal working times of the Site which are proposed to be 07:00 – 19:00 Monday – Friday and 07:00 – 13:00 on Saturdays and public holidays. Any deliveries to be made outwith these working times will be reviewed on a case by case with the Council basis taking into account a number of factors including, time and impact on local community, noise and traffic disruption;
- Unless otherwise agreed with Aberdeenshire Council, construction activities would in general be undertaken during daytime periods only;
- Preparation of a Path Management Plan to minimise potential conflicts between path users and construction activities. This would include appropriate signage, diversions routes (if required), cross facilities and warning signs;
- Tool box talks to assist construction staff in how to avoid conflicts with walkers and equestrians, including instructions on how to pass horses in safety;
- Adoption of a voluntary speed limit of 20 mph for all construction vehicles through villages which include Longside, Mintlaw, Stuartfield, Old Deer, Auchnagatt, New Deer, Fyvie, Oldmeldrum and Methlick. It is not anticipated that traffic will not travel through Maud village;
- Specific training and disciplinary measures would be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- All reversing operations and the movement of plant/deliveries which will take place on-site will be supervised and controlled;
- Appropriate traffic management measures would be put in place in the vicinity of each of the access junctions to the Site in order to avoid conflict with general traffic, subject to the agreement of the roads authority. Typical measures would include HGV turning and crossing signs and / or banksmen at the site access and warning signs;
- If temporary road closures are required at any locations, appropriate traffic management procedures including diversions will be introduced, in agreement with Aberdeenshire Council;
- The arrangements for Traffic Management will be communicated to the public and local community directly affected by construction traffic via the applicant. Other methods of communication which may be implemented by the project team include letter drops to landowners in the immediate vicinity to planned Traffic Management works, online update notices communicated via the project website and local press releases; and
- All visitors and new staff must undertake a Site induction. During the induction, personnel will be made aware of the Traffic Management Plan and Site rules.
- All drivers would be required to attend an induction to include:
    - A tool box talk safety briefing;
    - The need for appropriate care and speed control;
    - A briefing on driver speed reduction agreements (to slow site traffic at sensitive locations through the villages); and
    - Identification of the required access routes and the controls to ensure no departure from these routes.

Aberdeenshire Council may require an agreement to cover the cost of abnormal wear and tear on the local road network.

Video footage of the pre-construction phase condition of the road network within the study area would be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction stage of the proposed

development. Any necessary repairs would be coordinated with the Roads Authority. Any damage caused by traffic associated with the proposed development, during the construction period that would be hazardous to public traffic, would be repaired immediately.

Any damage to road infrastructure caused directly by construction traffic would be made good, and street furniture that is removed on a temporary basis would be fully reinstated.

There would be a regular road edge review and any debris and mud would be removed from the public carriageway to keep the road clean and safe during the initial months of construction activity, until the construction junction and immediate access track works are complete.

## 8.2 Public Information

Information on the site deliveries would be provided to local media outlets such as local papers and local radio to help assist the public.

Information would relate to expected vehicle movements from the port of entry through to the site access junction. This will assist residents becoming aware of the convoy movements and may help reduce any potential conflicts.

The Applicant would also ensure information was distributed through its communication team via the project website, local newsletters and social media.

## 8.3 Onsite Measures delivered using a Path Management Plan (PMP)

Within the Site, consideration has been given to pedestrians and cyclists alike due to potential interactions between construction traffic and users of the paths and public roads. If required, a Path Planning Study will be conducted post-consent and will be secured through a planning condition. Findings from the study will be used to formulate a set of measures into a Path Management Plan (PMP).

Users of the Core Paths will be separated from construction traffic through the use of barriers. Crossing points will be provided where required, with path users having right of way. Appropriate Traffic Signs Manual Chapter 8 compliant temporary road signage would be provided to assist at these crossing for the benefit of all users.

The principal contractor will ensure that speed limits are always adhered to by their drivers and associated subcontractors. This is particularly important within close proximity to the Core Paths, Rights of Way and at crossing points. Advisory speed limit signage will also be installed on approaches to areas where path users may interact with construction traffic.

Signage will be installed on the Site exits that makes drivers aware of local speed limits and reminding drivers of the potential presence of pedestrians and cyclists in the area. This will also be emphasised in the weekly toolbox talks.

While no scoping response has been received from The British Horse Society, measures implemented on similar schemes will be given consideration as part of the Proposed Development. These measures are predominantly focused are the interactions between HGV traffic and horses. Horses are normally nervous of large vehicles, particularly when they do not often meet them. Horses are flighty animals and will run away in panic if really frightened. Riders will do all they can to prevent this but, should it happen, it could cause a serious accident for other road users, as well as for the horse and rider.

The main factors causing fear in horses in this situation are:

- something approaching them, which is unfamiliar and intimidating;
- a large moving object, especially if it is noisy;
- lack of space between the horse and the vehicle;

- the sound of air brakes; and
- anxiety on the part of the rider.

The British Horse Society has previously recommended the following actions that will be included in the site training for all HGV staff:

- on seeing riders approaching, drivers must slow down and stop, minimising the sound of air brakes, if possible;
- if the horse still shows signs of nervousness while approaching the vehicle, the engine should be shut down (if it is safe to do so);
- the vehicle should not move off until the riders are well clear of the back of the HGV;
- if drivers are wishing to overtake riders, please approach slowly or even stop in order to give riders time to find a gateway or lay by where they can take refuge and create sufficient space between the horse and the vehicle. Because of the position of their eyes, horses are very aware of things coming up behind them; and
- all drivers delivering to the site must be patient. Riders will be doing their best to reassure their horses while often feeling a high degree of anxiety themselves.

## 8.4 Staff Travel Plan

A Staff Travel Plan will be deployed where necessary, to manage the arrival and departure profile of staff and to encourage sustainable modes of transport, especially car-sharing. A package of measures could include:

- appointment of a Travel Plan Coordinator (TPC);
- provision of public transport information;
- mini-bus service for transport of site staff;
- promotion of a car sharing scheme; and
- car parking management.

## 8.5 Operational Phase Mitigation

The permanent site access junction to the proposed Substation Site will be well maintained and monitored during the operational life of the development. Regular maintenance will be undertaken to keep the access junction drainage systems fully operation and to ensure there are no run-off issues onto the public road network.

# 9 Summary & Conclusions

Pell Frischmann Ltd. (PF) has been commissioned by Flotation Energy Ltd. to undertake a Transport Assessment for the Proposed Development, on behalf of Green Volt Offshore Windfarm Ltd (the Applicant).

A combination of new and existing traffic data established a base point for determining the impact during the construction phase and was factored to future levels to help determine the effect of construction traffic on the local road network.

The construction traffic would result in a temporary increase in traffic flows on the road network surrounding the Proposed Development. The peak of construction activity occurs in Month 5 of the programme and results in 464 daily movements (232 inbound and 232 outbound movements per day). Of these 464 daily movements, 396 movements are associated with HGV moving equipment to mobilise sections of the works as well as the import of track building materials from local quarries. The remaining 68 movements are associated with construction staff arriving at and departing from the Site.

A series of mitigation measures and management plans have been proposed and a draft CTMP has been provided to help mitigate and offset the impacts of both the construction and operational phase traffic flows.

No link capacity issues are expected on any of the roads assessed due to the additional movements associated with the Proposed Development. The effects of construction traffic are temporary in nature and are transitory.

# Appendix A Indicative Junction Layouts


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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Onshore Infrastructure Development

Drawing Title: Indicative Junctions

SPA Location: A90 Staggered Junctions

| | Name | Date |
|---|---|---|
| Drawn | SCM | 18/07/2023 |
| Designed | SC | 18/07/2023 |
| Checked | SC | 18/07/2023 |
| Point of Interest | | 1 |

Scale: 1:1000 @ A3

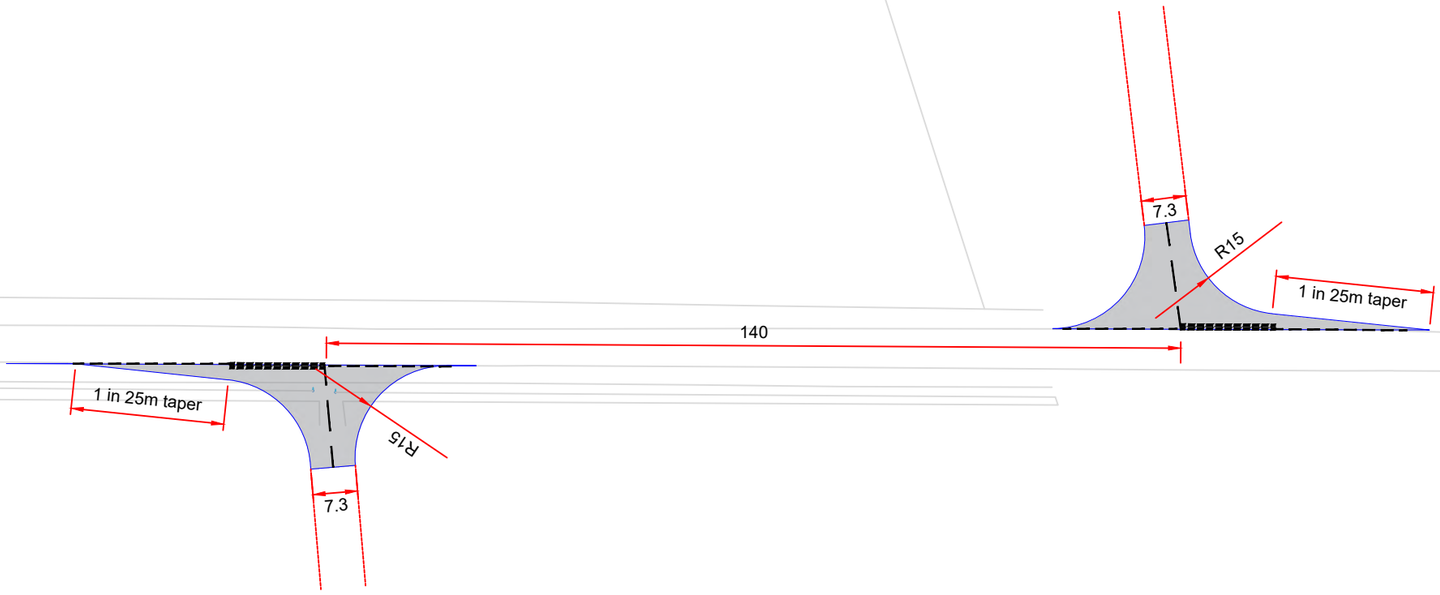
File No.: 230718 Junctions.dwg

Drawing Status: Draft

Drawing No.: SK01

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0



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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Onshore Infrastructure Development

Drawing Title: Indicative Junctions

SPA Location: A90 Staggered Junctions

| | Name | Date |
|---|---|---|
| Drawn | SCM | 18/07/2023 |
| Designed | SC | 18/07/2023 |
| Checked | SC | 18/07/2023 |
| Point of Interest | | 1 |

Scale: 1:1000 @ A3

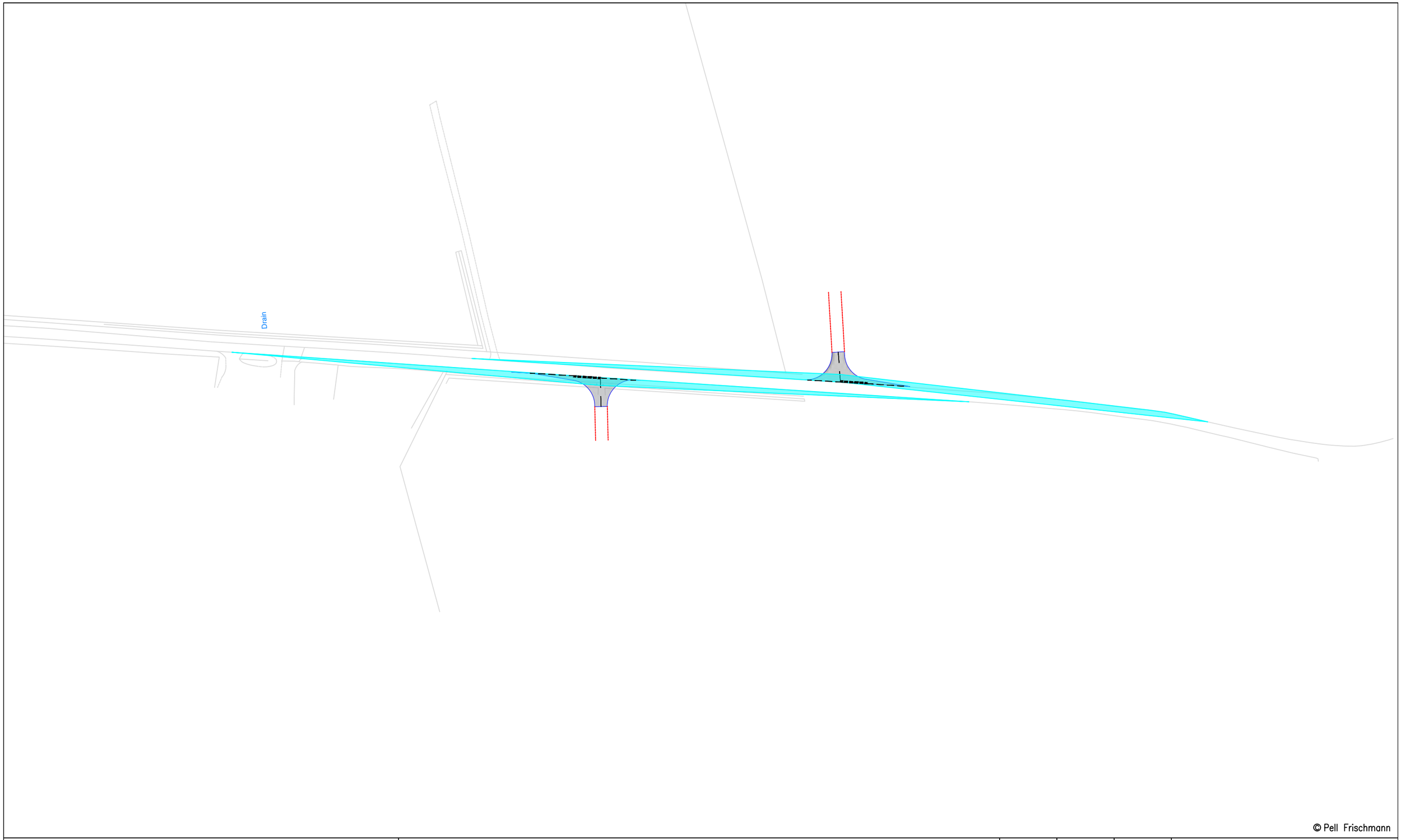
File No.: 230718 Junctions.dwg

Drawing Status: Draft

Drawing No.: SK01A

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0



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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Onshore Infrastructure Development

Drawing Title: Indicative Junctions

SPA Location: 4.5mx 215m Visibility Splay A90 Staggered Junctions

| | Name | Date |
|---|---|---|
| Drawn | SCM | 18/07/2023 |
| Designed | SC | 18/07/2023 |
| Checked | SC | 18/07/2023 |
| Point of Interest | | 2 |

Scale: 1:2000 @ A3

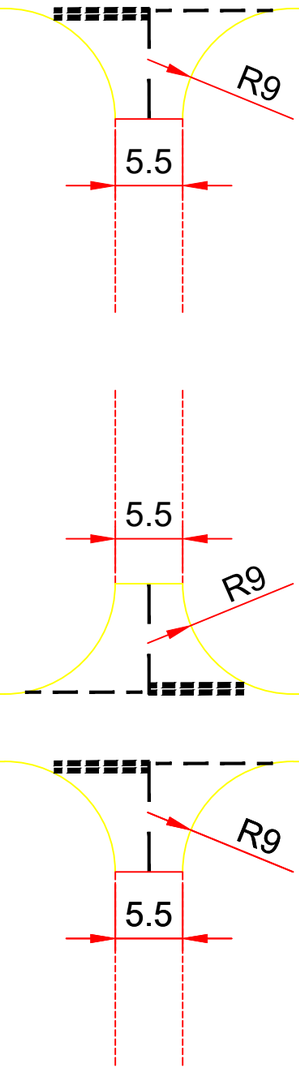
File No.: 230718 Junctions.dwg

Drawing Status: Draft

Drawing No.: SK02

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0



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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over–run | Over–sail

Project: Green Volt Onshore Infrastructure Development

Drawing Title: Indicative Junctions

SPA Location: Indicative Single Access and Crossing Layout

| | Name | Date |
|---|---|---|
| Drawn | SCM | 18/07/2023 |
| Designed | SC | 18/07/2023 |
| Checked | SC | 18/07/2023 |
| Point of Interest | | 2 |

Scale: 1:500 @ A3

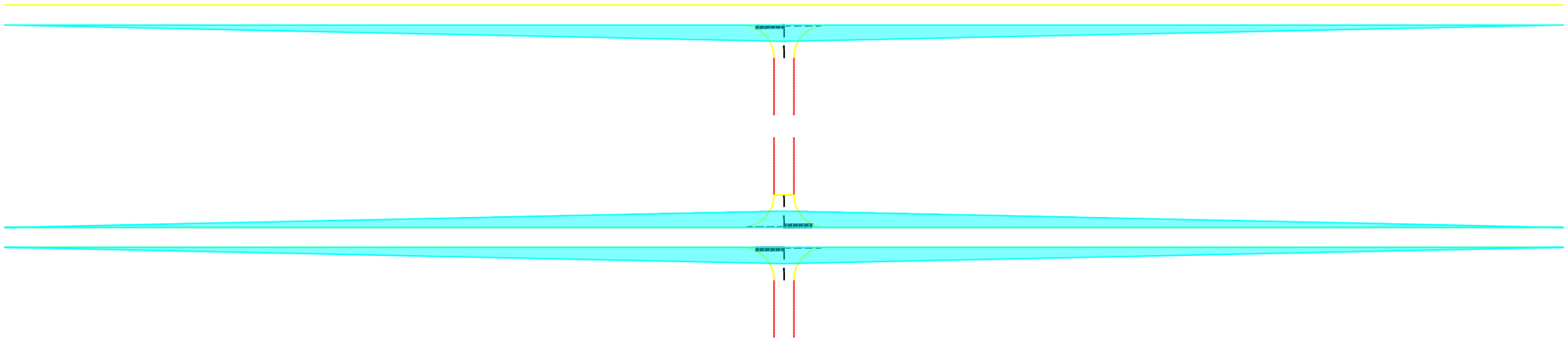
File No.: 230718 Junctions.dwg

Drawing Status: Draft

Drawing No.: SK03

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0





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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Onshore Infrastructure Development

Drawing Title: Indicative Junctions

SPA Location: Indicative Single Access and Crossing Layout 4.5m x 215m Visibility Splay

| | Name | Date |
|---|---|---|
| Drawn | SCM | 18/07/2023 |
| Designed | SC | 18/07/2023 |
| Checked | SC | 18/07/2023 |
| Point of Interest | | 2 |

Scale: 1:1500 @ A3

File No.: 230718 Junctions.dwg

Drawing Status: Draft

Drawing No.: SK04

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0

# Appendix B Construction Traffic Profile

Indicative Programme

| Month | | April | May | June | July | August | September | October | November | December | January | February | March | April | May | June | July | August | September | October | November | December | January | February | March | April | May | June | July | August | September |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2025 | | | | | | | | | 2026 | | | | | | | | | | | | 2027 | | | | | | | | |
| Month No | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| Substation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cabling | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Landfall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Substation** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Set Up | HGV | 200 | 200 | | | | | | | | | | | | | | | | | | | | | | | | | 150 | 150 | 50 | 50 |
| Plant Deliveries | HGV | | 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | 30 |
| Platform | HGV | | | 675 | 675 | 1350 | 1350 | 675 | 337 | 337 | | | | | | | | | | | | | | | | | | | | | |
| Concrete | HGV | | | | | 300 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pre-Cast Concrete | HGV | | | | | | | 200 | | | | | | | | | | | | | | | | | | | | | | | |
| Reinforcement | HGV | | | | 20 | | 20 | | | | | | | | | | | | | | | | | | | | | | | | |
| Road Materials | HGV | | | | | | | | | | 80 | 80 | 80 | 80 | | | | | | | | | | | | | | | | | |
| Drainage | HGV | | | | | | | | | | | | | | 10 | 10 | | | | | | | | | | | | | | | |
| Structures | HGV | | | | | | | | | | | | | | | | 24 | 24 | | | | | | | | | | | | | |
| AIL Movements | HGV | | | | | | | | | | | | | | | | | | 4 | | | | | | | | | | | | |
| Switchgear | HGV | | | | | | | | | | | | | | | | | | | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | | | | |
| Landscaping | HGV | | | | | | | | | | | | | | | | | | | | 80 | 80 | 80 | 80 | 80 | | | | | | |
| General Supplies | HGV | | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 48 | 48 |
| Commissioning | LGV | | | | | | | | | | | | | | | | | | | | | | | | | | | 440 | 440 | 220 | 220 |
| Staff | LGV | | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 198 | 198 |
| ***LGV Total / Day*** | | ***0*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***18*** | ***38*** | ***38*** | ***19*** | ***19*** |
| ***HGV Total / Day*** | | ***9*** | ***16*** | ***35*** | ***36*** | ***79*** | ***67*** | ***44*** | ***20*** | ***20*** | ***8*** | ***8*** | ***8*** | ***8*** | ***5*** | ***5*** | ***5*** | ***5*** | ***5*** | ***8*** | ***12*** | ***12*** | ***12*** | ***12*** | ***12*** | ***8*** | ***8*** | ***11*** | ***11*** | ***6*** | ***6*** |
| ***Total / Day*** | | ***9*** | ***34*** | ***53*** | ***54*** | ***97*** | ***85*** | ***62*** | ***38*** | ***38*** | ***26*** | ***26*** | ***26*** | ***26*** | ***23*** | ***23*** | ***23*** | ***23*** | ***23*** | ***26*** | ***30*** | ***30*** | ***30*** | ***30*** | ***30*** | ***26*** | ***26*** | ***49*** | ***49*** | ***25*** | ***25*** |
| **Landfall** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Set Up | HGV | | 120 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Plant Deliveries | HGV | | 100 | | | | | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| Platform | HGV | | | 230 | 230 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Piling | HGV | | | | 40 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Construction Materials | HGV | | | | | 30 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Remediation | HGV | | | | | 400 | | | | | | | | | | | | | | | | | | | | | | | | | |
| General Materials | HGV | | 96 | 96 | 96 | 96 | 96 | 96 | | | | | | | | | | | | | | | | | | | | | | | |
| Staff | LGV | | 240 | 240 | 240 | 240 | 240 | 240 | | | | | | | | | | | | | | | | | | | | | | | |
| ***LGV Total / Day*** | | ***0*** | ***11*** | ***11*** | ***11*** | ***11*** | ***11*** | ***11*** | | | | | | | | | | | | | | | | | | | | | | | |
| ***HGV Total / Day*** | | ***0*** | ***14*** | ***15*** | ***17*** | ***24*** | ***4*** | ***9*** | | | | | | | | | | | | | | | | | | | | | | | |
| ***Total / Day*** | | ***0*** | ***25*** | ***26*** | ***28*** | ***35*** | ***15*** | ***20*** | | | | | | | | | | | | | | | | | | | | | | | |
| **Cabling** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Set Up | HGV | 463 | 463 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Compound Works | | 231 | 231 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Haul Road | HGV | | 2157 | 2157 | 2157 | 2157 | 2157 | 2157 | 2157 | | | | | | | | | | | | | | | | | | | | | | |
| Backfill Materials | HGV | | | 3792 | 3792 | 3792 | 3792 | 3792 | 3792 | | | | | | | | | | | | | | | | | | | | | | |
| Tape / Tile Deliveries | HGV | | 4 | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | |
| Ducting | HGV | | | 44 | 44 | 44 | 44 | | | | | | | | | | | | | | | | | | | | | | | | |
| Cabling | HGV | | | | 54 | 54 | 54 | 54 | 54 | | | | | | | | | | | | | | | | | | | | | | |
| HDD Works | HGV | | | | | 206 | 206 | | | | | | | | | | | | | | | | | | | | | | | | |
| Transition Bays | HGV | | | | | 94 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Joint Bays & Link Boxes | HGV | | | | | | 287 | 287 | 287 | | | | | | | | | | | | | | | | | | | | | | |
| Demobilisation of Haul Road | HGV | | | | | | | | | | | | | 3019 | 3019 | 3019 | 3019 | 3019 | | | | | | | | | | | | | |
| Demobilistaion of Compounds | HGV | | | | | | | | | | | | | 421 | 421 | 421 | 421 | | | | | | | | | | | | | | |
| General Supplies | HGV | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 44 | 44 | | | | 96 | 96 | 96 | 96 | 96 | | | | | | | | | | | | | |
| Commissioning | LGV | | | | | | | | 440 | 440 | | | | | | | | | | | | | | | | | | | | | |
| Staff | LGV | 432 | 864 | 864 | 864 | 864 | 864 | 864 | 864 | 432 | | | | 864 | 864 | 864 | 864 | 864 | | | | | | | | | | | | | |
| ***LGV Total / Day*** | | ***20*** | ***39*** | ***39*** | ***39*** | ***39*** | ***39*** | ***39*** | ***59*** | ***40*** | ***0*** | ***0*** | ***0*** | ***39*** | ***39*** | ***39*** | ***39*** | ***39*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** |
| ***HGV Total / Day*** | | ***36*** | ***134*** | ***277*** | ***279*** | ***293*** | ***302*** | ***290*** | ***288*** | ***2*** | ***0*** | ***0*** | ***0*** | ***161*** | ***161*** | ***161*** | ***161*** | ***142*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** |
| ***Total / Day*** | | ***56*** | ***173*** | ***316*** | ***318*** | ***332*** | ***341*** | ***330*** | ***347*** | ***42*** | ***0*** | ***0*** | ***0*** | ***200*** | ***200*** | ***200*** | ***200*** | ***181*** | | | | | | | | | | | | | |
| **Whole Project** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***LGV Total / Day*** | | **20** | **68** | **68** | **68** | **68** | **68** | **68** | **77** | **58** | **18** | **18** | **18** | **57** | **57** | **57** | **57** | **57** | **18** | **18** | **18** | **18** | **18** | **18** | **18** | **18** | **18** | **38** | **38** | **19** | **19** |
| ***HGV Total / Day*** | | **45** | **165** | **327** | **332** | **396** | **373** | **343** | **308** | **22** | **8** | **8** | **8** | **169** | **166** | **166** | **166** | **147** | **5** | **8** | **12** | **12** | **12** | **12** | **12** | **8** | **8** | **11** | **11** | **6** | **6** |
| ***Total / Day*** | | **65** | **233** | **395** | **400** | **464** | **441** | **411** | **385** | **79** | **26** | **26** | **26** | **226** | **223** | **223** | **223** | **204** | **23** | **26** | **30** | **30** | **30** | **30** | **30** | **26** | **26** | **49** | **49** | **25** | **25** |

| ***Peak Traffic*** | |
|---|---|
| LGV | 68 |
| HGV | 396 |
| Total | 464 |

# Appendix C Abnormal Loads Route Survey Report

Pell Frischmann

# Green Volt Windfarm

## Abnormal Load Route Survey

August 2023

107749

| | |
|---|---|
| **Report Ref.** | **230704 Green Volt Rsr** |
| **File Path** | **https://pellf.sharepoint.com/sites/EdinburghOfficeTeam/Shared Documents/General/Projects/107749 Flotation Energy Green /Reports/230704 Green Volt RSR.docx** |

| Rev | Suit | Description | Date | Originator | Checker | Approver |
|---|---|---|---|---|---|---|
| 01 | | Draft | 06/07/2023 | Gordon Buchan | Timothy Lockett | Gordon Buchan |
| | | Final | 02/08/2023 | Gordon Buchan | Timothy Lockett | Gordon Buchan |
| | | | | | | |
| | | | | | | |

Ref. reference. Rev revision. Suit suitability.

**Prepared for**

**Flotation Energy Limited**

12 Alva Street
Edinburgh
EH2 4QG

**Prepared by**

**Pell Frischmann**

93 George Street
Edinburgh
EH2 3ES

# Contents



## Figures



## Tables



## Appendices

# 1 Introduction

Pell Frischmann (PF) has been commissioned by Flotation Energy Limited (Flotation), on behalf of Green Volt Offshore Windfarm Ltd (the Applicant), to undertake a survey of the delivery route for Abnormal Indivisible Loads (AIL) associated with the construction and development of the substation for the proposed Green Volt Offshore Windfarm.

The Route Survey Report (RSR) has been prepared to help inform Flotation on the likely issues associated with the development of the proposed Substation Site with regards to on-site transport and access for AIL traffic. The report identifies the key issues associated with AIL deliveries from the Port of Peterhead to the proposed Substation Site and notes that remedial works, either in the form of physical works or as traffic management interventions, will be required to accommodate the predicted loads.

The detailed assessment and subsequent designs of any remedial works are beyond the agreed scope of works between PF and Flotation at this point in time.

It is the responsibility of the equipment supplier to ensure that the entirety of the proposed access route is suitable and meets with their satisfaction. The equipment supplier will be responsible for ensuring that the finalised proposals meet with the appropriate levels of health and safety consideration for all road users and has been made in accordance with the relevant legislation at the time of delivery.

# 2 Site Description & Locations

## 2.1 Proposed Development

The proposed Substation Site is located to the immediate south of the recently constructed New Deer and Moray East substations, near New Deer, Aberdeenshire.

The site is illustrated in Figure 1.

**Figure 1 Site Location**


Construction access to the Site has been reviewed and would be from the east from the public road running between Maryhill and North Millbrex.

To allow the proposed offshore windfarm to connect to the national electrical grid, new transformers will be required. These transformers will be located within the site and due to their size and weight are classified as AIL.

## 2.2 AIL Vehicles

Details of the proposed transformer loads will be confirmed at the detailed design stage of the project, post planning determination. To provide an initial review of access it has been assumed that the transformers will be no larger than those used for the neighbouring Moray East project and that the same access route from the Port of Peterhead will be used.

The candidate transformers have a maximum transport weight of 275 tonnes. The loads would be a maximum of 11.5 metres (m) in length by 4m in width by 4.6m in height. These represent a worst case load and are likely to reduce in scale when the proposed Substation Site is constructed.

To transport loads such as these a two bolster girder frame trailer is to be used, as per the Moray East deliveries. This has ten axles in the front and rear bolster with the load suspended between. An example trailer is illustrated in Figure 2.

**Figure 2 Example Transformer Load Transporter**

The combined weight of the trailer when loaded is 410 tonnes, with an axle loading of 18.8 tonnes.

Various road improvements would be required to enable access. These enhancements are noted in the following sections, however no detailed design options have been undertaken as yet. These would generally be progressed once the client has selected their final preferences for equipment.

The access options have only considered access to the proposed Substation Site boundary. Access within the Site has not been considered at this time.

# 3 Access Route Review

## 3.1 Access Options

Access from the Port of Peterhead has been considered through to the site access junction. The access option is illustrated in Figure 3.

**Figure 3 Access Option**

The proposed route is as follows:

- Exit the port onto Bath Street and turn left;
- Continue west on Charlotte Street and Kirk Street;
- Take the first exit at the roundabout and proceed southbound on the A982 South Street;
- Continue southbound, joining the A90 and proceeding to Ellon;
- Depart the A90 and join the A948 westbound at Ellon;
- Continue on the A848 northbound, passing through Auchnagatt and New Deer;
- Turn onto the B9170 Auchreddie Road West;
- Turn left onto the unclassified road leading to Greens;
- Turn left onto the unclassified road between Maryhill and North Millbrex; and
- Turn right into a new Site access junction.

A review of the access route has been undertaken to review potential areas of interest and constraint.

## 3.2 Routes Description

The following locations were identified from the Site review and are detailed in Table 1. Plans illustrating the location of the constraints and a detailed list of Points of Interest (POI) are provided in Appendix A.

**Table 1 Route Constraints**

| POI | Key Constraint | Details |
|---|---|---|
| 1 | **Bath Street Junction**<br>  | Loads will exit the port onto Bath Street and will proceed to the west.<br>A swept path assessment has been undertaken and indicates that loads will over-run the footway on either side of Merchant's Quay where a temporary load bearing surface will be required. Underground services should be protected at these locations.<br>Parking opposite the junction should be suspended during deliveries. A Temporary Traffic Regulation Order (TTRO) will be required.<br>SK01 is included within Appendix B. |
| 2 | **Kirk Street Junction**<br>  | Loads will turn left onto Kirk Street.<br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required. Traffic management will be necessary to hold back oncoming traffic at the junction.<br>SK02 is included within Appendix B. |
| 3 | **Kirk Street / South Road Roundabout**<br>  | Loads will take the first exit at the roundabout, turning onto South Road.<br>A swept path assessment has been undertaken and indicates that loads will require access to both lanes on the South Road exit.<br>A pedestrian crossing island south of the junction will need to be removed and a load bearing surface provided. The existing bollards and lighting column will need to be removed. Similar works are required to the south at a further crossing island.<br>SK03 is included within Appendix B. |
| 4 | **A90 Invernettie Roundabout**<br>  | Loads will proceed south onto the A90 taking the second exit.<br>A swept path assessment has been undertaken and indicates that the loads will oversail the central island of the junction where one chevron sign should be removed.<br>SK04 is included within Appendix B. |
| 5 | **A90 / A948 Roundabout**<br>  | Loads will turn off the A90, using a contraflow transit of the junction.<br>A swept path assessment has been undertaken and indicates that two lighting columns on the inside of the junction will need to be removed.<br>A temporary load bearing surface is required on the exit splitter island where one road sign and one bollard should be removed.<br>SK05 is included within Appendix B. |

| POI | Key Constraint | Details |
|---|---|---|
| 6 | **A948 / A920 Roundabout**<br>  | Loads will undertake a contraflow transit of the junction, taking the second exit and continuing on the A948.<br><br>A swept path assessment has been undertaken and indicates that one chevron sign will need to be removed to facilitate loads oversailing the central island of the junction.<br><br>SK05 is included within Appendix B. |
| 7 | **A948 Bend near Hilton Croft**<br>  | Loads will continue ahead on the A948.<br><br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location. Oncoming traffic should however he held back in advance of the bend by the lead escorts to allow loads access to both lanes.<br><br>SK06 is included within Appendix B. |
| 8 | **A948 Bridge south of Lammermuir**<br>  | Loads will continue ahead on the A948.<br><br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location. Oncoming traffic should however he held back in advance of the bend by the lead escorts to allow loads access to both lanes.<br><br>SK07 is included within Appendix B. |
| 9 | **A948 at West Auquhaldie**<br>  | Loads will continue ahead on the A948.<br><br>No physical mitigation works are required at this location. Oncoming traffic should however he held back in advance of the bend by the lead escorts to allow loads access to both lanes.<br><br>SK08 is included within Appendix B. |
| 10 | **A948 at Backhill of Auquhaldie**<br>  | Loads will continue ahead on the A948.<br><br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location.<br><br>Convoy management will be required to hold oncoming traffic in advance of the bend.<br><br>SK09 is included within Appendix B. |

| POI | Key Constraint | Details |
|---|---|---|
| 11 | **A948 at Burn of Fortree**<br>  | Loads will continue ahead on the A948.<br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location. The load bed of the trailer however should be elevated to allow loads to oversail the bridge parapets to the west.<br>SK10 is included within Appendix B. |
| 12 | **A948 south of Mill of Elrick**<br>  | Loads will continue ahead on the A948.<br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location. Oncoming traffic should however he held back in advance of the bend by the lead escorts to allow loads access to both lanes.<br>SK011 is included within Appendix B. |
| 13 | **A948 Mill of Elrick**<br>  | Loads will continue ahead on the A948.<br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location. Clearances to the wall and fence on the inside of the bend are constrained.<br>Convoy management will be required to hold oncoming traffic in advance of the bend.<br>SK12 is included within Appendix B. |
| 14 | **A948 at Auchnagatt**<br>  | Loads will continue ahead on the A948.<br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location. Oncoming traffic should however he held back in advance of the bend by the lead escorts to allow loads access to both lanes.<br>SK13 is included within Appendix B. |
| 15 | **A948 at the Barrack Junction**<br>  | Loads will continue ahead on the A948.<br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location. Oncoming traffic should however he held back in advance of the bend by the lead escorts to allow loads access to both lanes.<br>SK14 is included within Appendix B. |

| POI | Key Constraint | Details |
|---|---|---|
| 16 | **A948 Bend**<br>  | Loads will continue ahead on the A948.<br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location.<br>Tree canopy trimming may be required to provide a clear height of 5m.<br>SK15 is included within Appendix B. |
| 17 | **A948 South of Nethermuir**<br>  | Loads will continue ahead on the A948.<br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location. Oncoming traffic should however he held back in advance of the bend by the lead escorts to allow loads access to both lanes.<br>SK16 is included within Appendix B. |
| 18 | **A948 North of Nethermuir**<br>  | Loads will continue ahead on the A948.<br>Loads will oversail the inside verge where one utility will need to be relocated. |
| 19 | **A948 North of the Lang Stracht Junction**<br>  | Loads will continue ahead on the A948.<br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location. Oncoming traffic should however he held back in advance of the bend by the lead escorts to allow loads access to both lanes.<br>SK17 is included within Appendix B. |
| 20 | **A948 Southeast of New Deer**<br>  | Loads will continue ahead on the A948.<br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location. A parking suspension in the layby will be required and a Temporary Traffic Regulation Order (TTRO) will be necessary.<br>Oncoming traffic should however he held back in advance of the bend by the lead escorts to allow loads access to both lanes.<br>SK18 is included within Appendix B. |

| POI | Key Constraint | Details |
|---|---|---|
| 21 | **B9170 / Greens Road Junction**<br>  | Loads will turn left onto Greens Road at the junction.<br>A swept path assessment has been undertaken and indicates that loads will reuse the junction widening works previously provided at this location.<br>SK19 is included within Appendix B. |
| 22 | **Greens Road Bend**<br>  | Loads will continue ahead on Greens Road.<br>A swept path assessment has been undertaken and indicates that no physical mitigation works are required at this location. Oncoming traffic should however he held back in advance of the bend by the lead escorts to allow loads access to both lanes.<br>SK20 is included within Appendix B. |
| 23 | **Greens Road at Little Slacks**<br>  | Loads will continue ahead on Greens Road.<br>A swept path assessment has been undertaken and indicates that loads will oversail the inside of bend, where vegetation trimming works will be required within the adopted verge.<br>SK21 is included within Appendix B. |
| 24 | **Greens Road at Upper Cairnbanno**<br>  | Loads will continue ahead on Greens Road.<br>A swept path assessment has been undertaken and indicates that the tree canopy will need to be trimmed to provide a clearance of 5m from the road.<br>SK22 is included within Appendix B. |
| 25 | **Greens Road at Upperton**<br>  | Loads will continue ahead on Greens Road.<br>A swept path assessment has been undertaken and indicates that loads will pass the bend, however clearances to the wall and fence on the inside of the bend are constrained.<br>SK22 is included within Appendix B. |

| POI | Key Constraint | Details |
|---|---|---|
| 26 | **Burn of Greens**<br>  | Loads will continue ahead on Greens Road.<br>A swept path assessment has been undertaken and indicates that loads should be raised to allow them to oversail the bridge parapets.<br>Following the bridge, one road sign on the inside of the right hand bend should be removed and tree canopy trimmed to provide a clear 5m height clearance.<br>SK23 is included within Appendix B. |
| 27 | **Greens Road Junction**<br>  | Loads will turn left at the junction and will proceed southbound towards the proposed substation location.<br>A swept path assessment has been undertaken and indicates that loads will require a load bearing surface in third party land at the junction. The existing fence should be removed to facilitate access.<br>SK24 is included within Appendix B. |
| 28 | **Site Access Junction**<br>  | Loads will turn right into a new Site access junction and will then proceed to the final location using a private access track. |

## 3.3 Swept Path Assessment Results and Summary

The detailed swept path drawings for the locations assessed are provided in Appendix B and illustrate tracking undertaken for the worst-case loads.

The colours illustrated on the swept paths are:

- Grey / Black – OS / Topographical Base Mapping;
- Green – Vehicle body outline (body swept path);
- Red – Tracked pathway of the wheels (wheel swept path); and
- Purple – The over-sail tracked path of the load where it encroaches out with the trailer (load swept path).

Where mitigation works are required, the extents of over-run and over-sail areas are illustrated on the swept path drawings.

Please note that where assessments have been undertaken using Ordnance Survey (OS) or aerial photography base mapping, there can be errors in the data source. The available OS mapping does not identify the road edge through some sections. An indicative road edge has been provided for illustration only and should be confirmed through a test run or the completion of a topographical survey at these locations.

There are sections of this route where there is no available OS data as new road links have yet to be completed. In these areas, alternative data sources have been used. Reassessment of these areas should be undertaken once more accurate data becomes available.

## 3.4 Land Ownership

The limits of road adoption can vary depending upon the location of the site and the history of the roads agency. The adopted area is generally defined as land contained within a defined boundary where the road agency holds the maintenance rights for the land from the original landowner. In urban areas, this is usually defined as the area from the edge of the footway across the road to the opposing footway back edge.

In rural areas the area of adoption can be open to greater interpretation as defined boundaries may not be readily visible. In these locations, the general rule is that the area of adoption is between established fence / hedge lines or a maximum 2m from the road edge. This can vary between areas and location.

## 3.5 Weight Review

A weight review for the Moray East project was undertaken with Aberdeenshire Council and Transport Scotland in 2018. Several structures were subject to a detailed structural assessment and improvement works.

A revised weight review will be undertaken once the candidate transformer has been confirmed. A full Approval In Principle (AIP) review of all structures of concern will be undertaken with Aberdeenshire Council and any upgrade works will be undertaken prior to loads being delivered to the proposed Substation Site.

## 3.6 Summary Issues

It is strongly recommended that following a review of the RSR, the Applicant should undertake the following prior to the delivery of the first abnormal loads, to ensure load and road user safety:

- Confirm the finalised component dimensions and weights and update the RSR accordingly;
- A revised review of axle loading on structures along the entire access route with the various road agencies is undertaken immediately prior to the loads being transported in case of last minute changes to structures;
- A review of clear heights with utility providers and the transport agencies along the route to ensure that there is sufficient space to allow for loads plus sufficient flashover protection (to electrical installations);
- That any verge vegetation and tree canopies which may foul loads is trimmed prior to loads moving;
- That a review of potential roadworks and or closures is undertaken once the delivery schedule is established in draft form;
- That a test run is completed to confirm the route and review any vertical clearance issues, where practical; and
- That a condition survey is undertaken to ascertain the extents of road defects prior to loads commencing to protect from spurious damage claims.

# 4 Summary

## 4.1 Summary of Access Review

Pell Frishmann has been commissioned by Flotation Energy Limited on behalf of on behalf of the Applicant Green Volt Offshore Windfarm Ltd, to prepare a Route Survey Report to examine the issues associated with the transport of transformer components to the proposed Substation Site, from the Port of Peterhead.

This report identifies the key points and issues associated with the proposed route and outlines the issues that will need to be considered for successful delivery of the components.

The report is presented for consideration to Flotation Energy Limited. Various road modifications, structural reviews and interventions are required to successfully access the Site. If these are undertaken, access to the proposed Substation Site is considered feasible.

# Appendix A Points of Interest

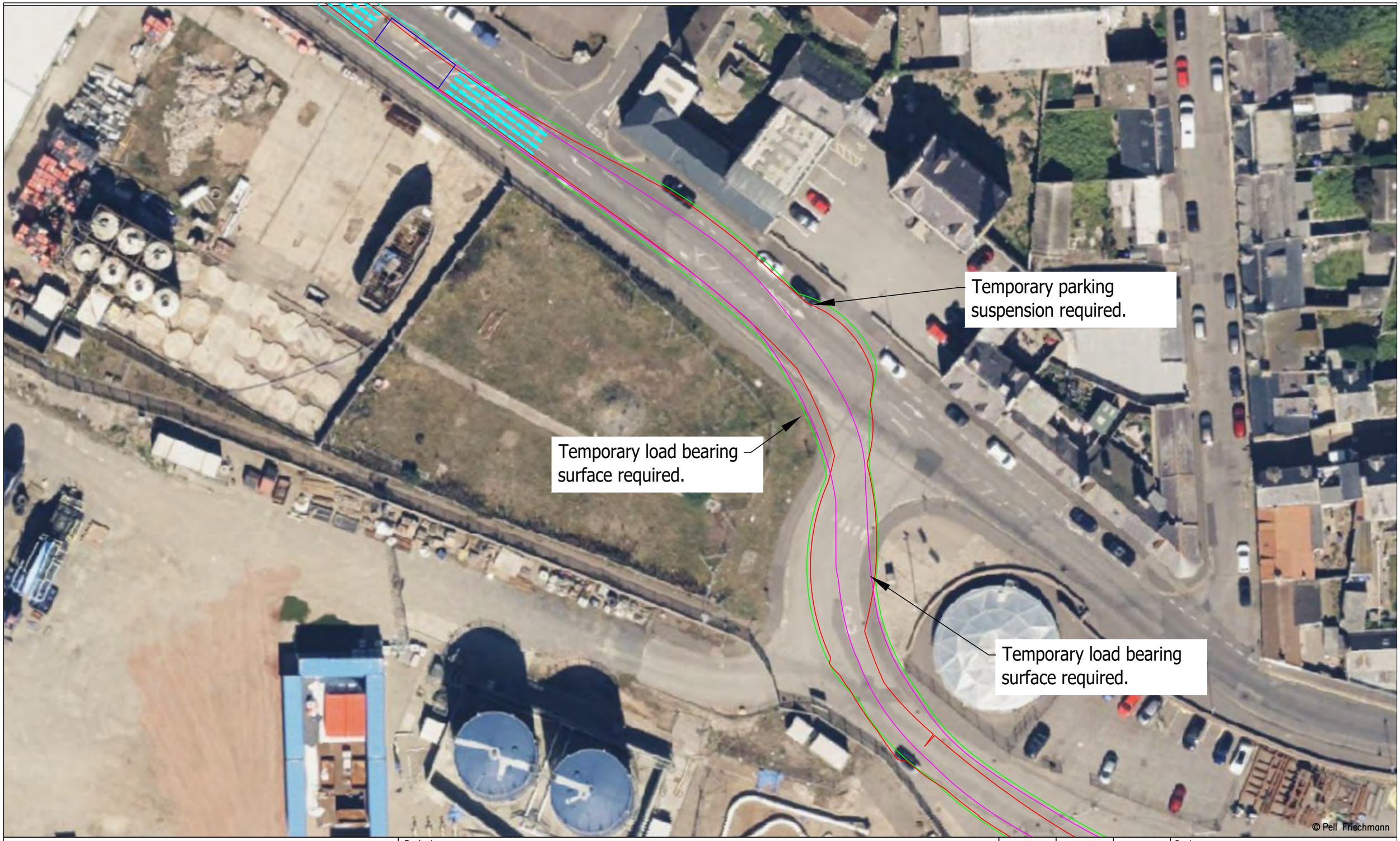

Peterhead
Burnhaven
1
2
3
4


Auchnahyre
Auchmacoy
Ellon
5
6


11
10
9
8
7


16
17
18
15
14
13
12

# Appendix B Swept Path Assessment Drawings

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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: Bath Street Junction

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 1 |

Scale: 1:500 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK01

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0


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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: Kirk Street Junction

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 2 |

Scale: Custom @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK02

Notes:
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Revision: 0

Remove crossing island and provide load bearing surface. Remove bollards and lighting column.



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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: Kirk Street / South Road Roundabout

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 3 |

Scale: Custom @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK03

Notes:
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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over–run | Over–sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A90 Invernettie Roundabout

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 1 |

Scale: 1:500 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK04

Notes:
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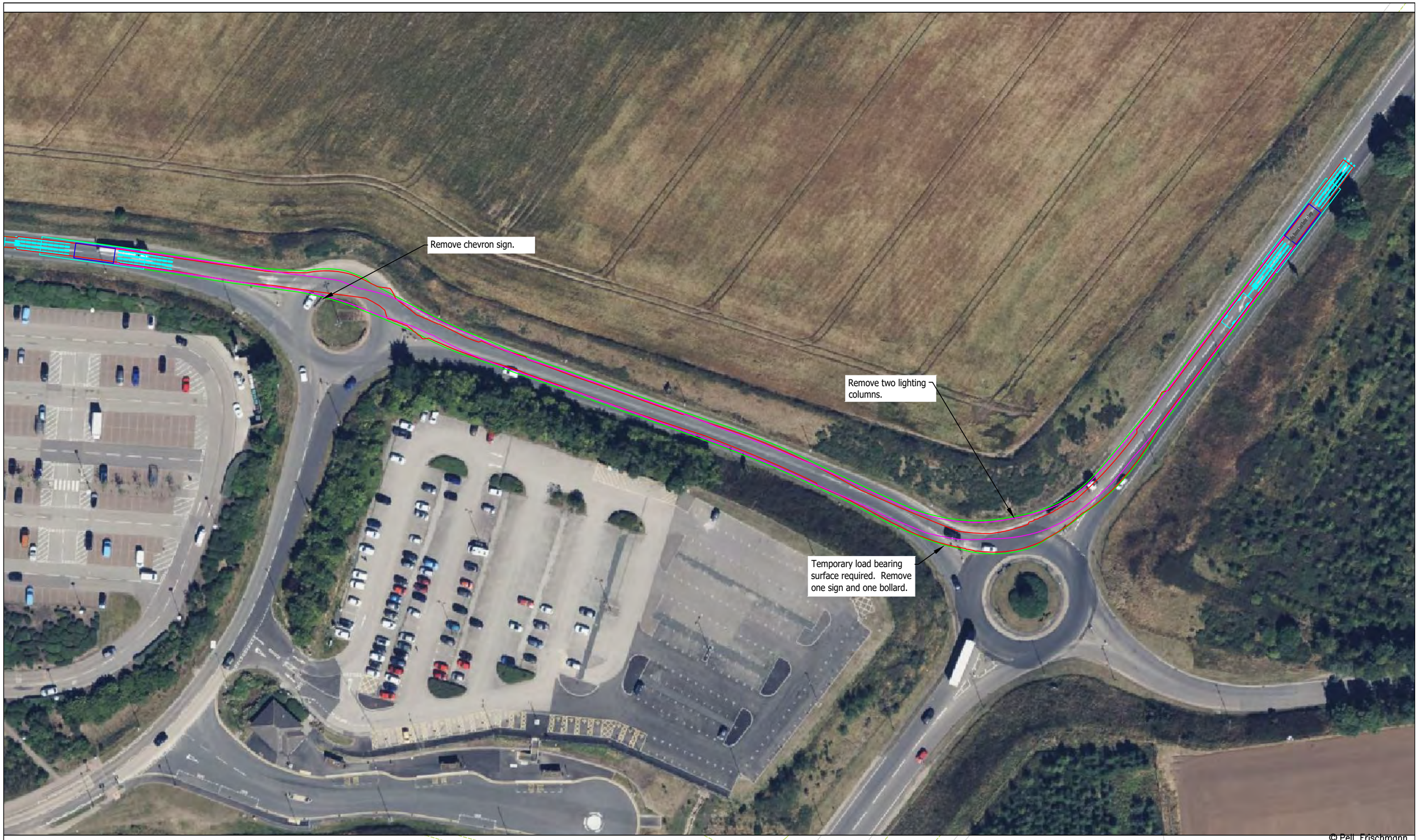




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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A90 / A948 Roundabout & A948 / A920 Roundabouts

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 5 & 6 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK05

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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 bend near Hilton Croft

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 7 |

Scale: 1:500 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK06

Notes:
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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over–run | Over–sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 Bridge south of Lammermuir

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 8 |

Scale: 1:500 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK07

Notes:
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Revision: 0



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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 at West Auquhaldie

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 9 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK08

Notes:
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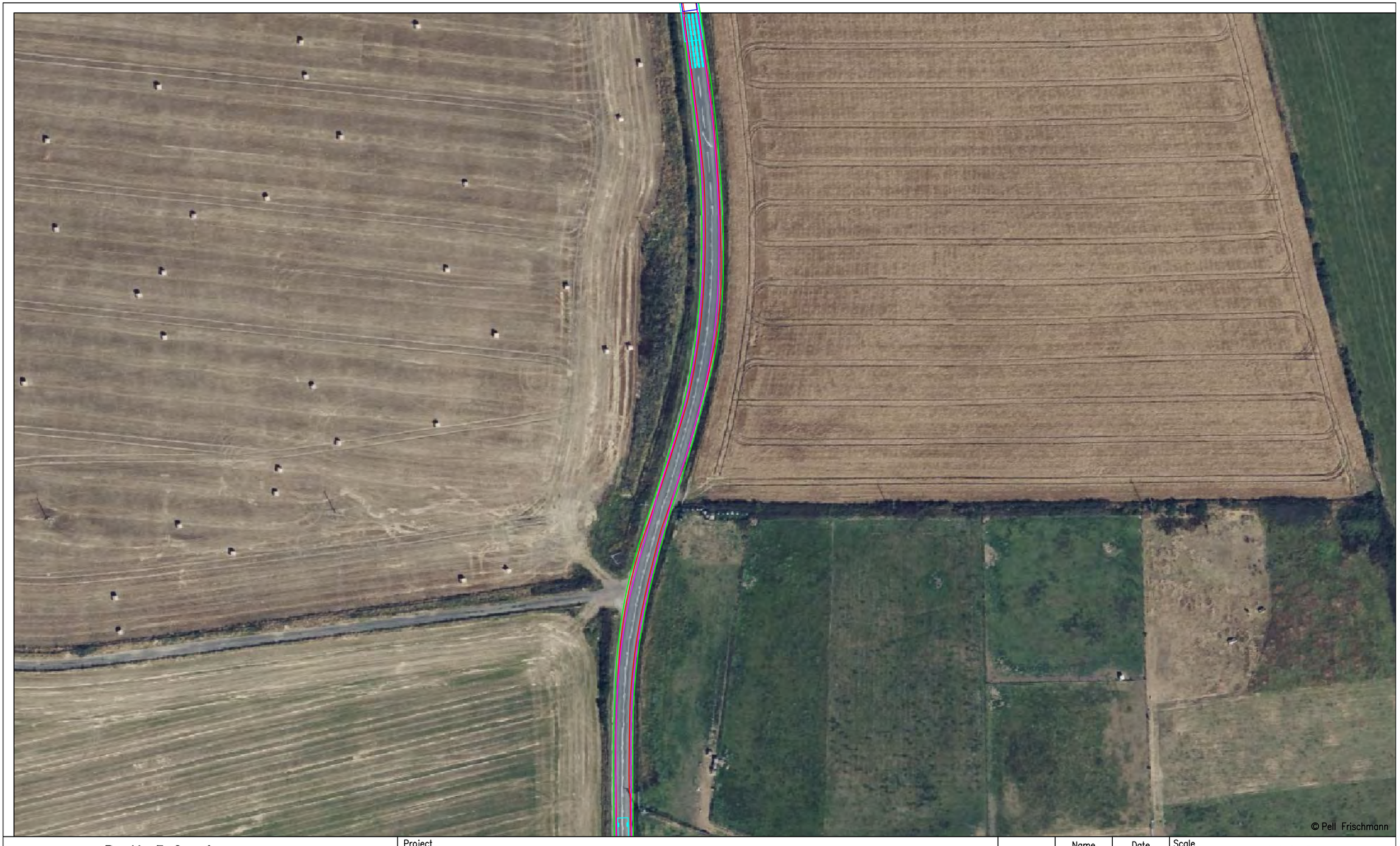


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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over–run | Over–sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 at Backhill of Auquhaldie

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 10 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK09

Notes:
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Revision: 0




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Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 at Burn of Fortree

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 11 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK10

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0

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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over–run | Over–sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 south of Mill of Elrick

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 12 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK11

Notes:
1. All mitigation is subject to confirmation through a test run.
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Client: Flotation Energy Limited

Key: Wheel SPA; Body SPA; Load SPA; Indicative; Over-run; Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 Mill of Elrick

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 13 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK12

Notes:
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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 at Auchnagatt

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 14 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK13

Notes:
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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 at Barrack Junction

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 15 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK14

Notes:
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Revision: 0


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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 Bend

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 16 |

Scale: 1:500 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK15

Notes:
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Revision: 0


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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 South of Nethermuir

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 17 |

Scale: 1:500 @ A3

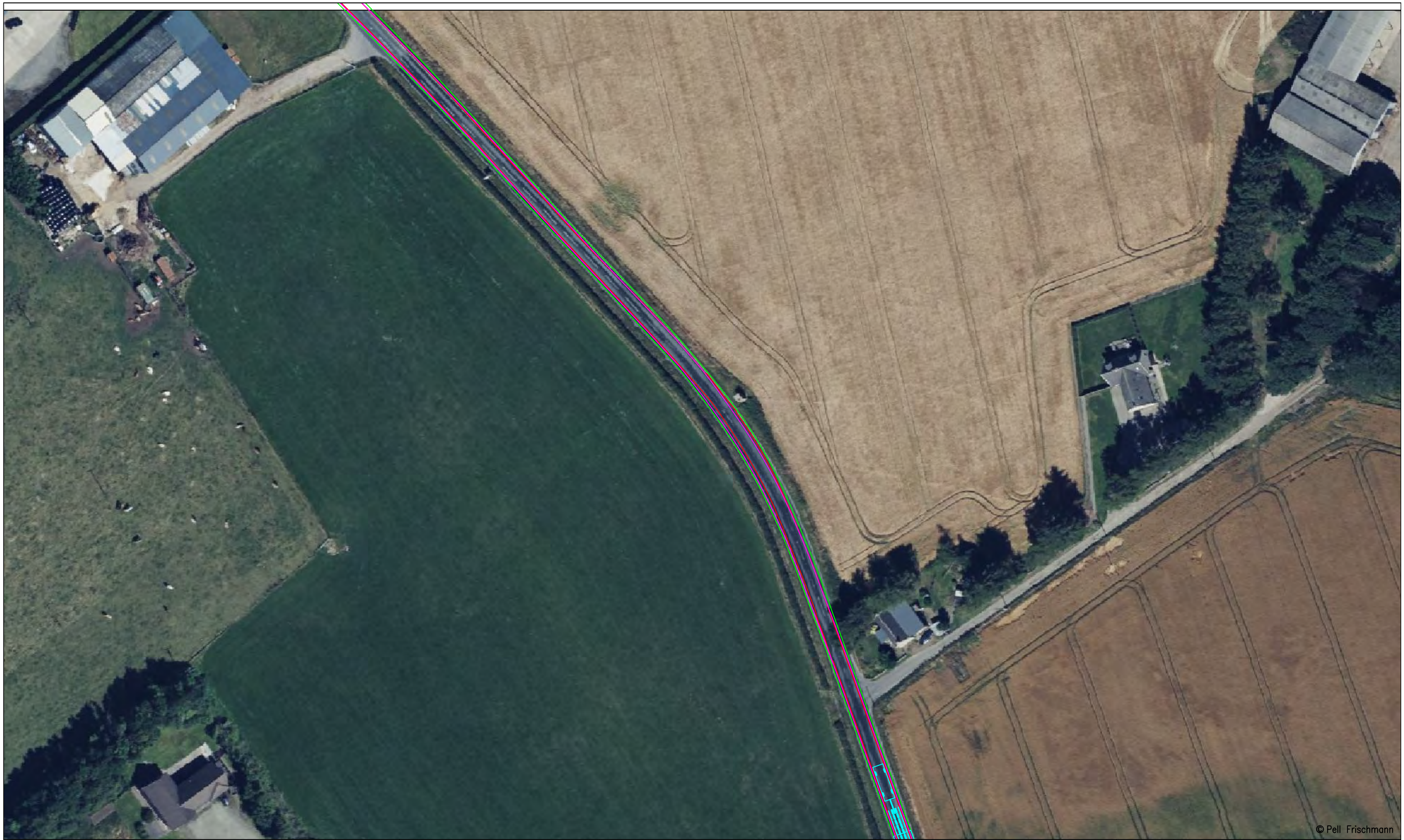
File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK16

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0

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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 North of the Lang Stracht Junction

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 19 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK17

Notes:
1. All mitigation is subject to confirmation through a test run.
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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: A948 Southeast of New Deer

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 20 |

Scale: 1:500 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK18

Notes:
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Reuse existing junction widening works.



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Client: Flotation Energy Limited

Key: Wheel SPA; Body SPA; Load SPA; Indicative; Over-run; Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: B9170 / Greens Road Junction

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 21 |

Scale: 1:500 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK19

Notes:
1. All mitigation is subject to confirmation through a test run.
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Client: Flotation Energy Limited

Key: Wheel SPA; Body SPA; Load SPA; Indicative; Over-run; Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: Greens Road Bend

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 22 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK20

Notes:
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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: Greens Road at Little Slacks

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 22 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK21

Notes:
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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: Greens Road at Upper Cairnbanno and Upperton

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 24 & 25 |

Scale: 1:1000 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK22

Notes:
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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: Burn of Greens

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 26 |

Scale: 1:500 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK23

Notes:
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Create load bearing surface. Remove existing fencing.



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Client: Flotation Energy Limited

Key: Wheel SPA; Body SPA; Load SPA; Indicative; Over-run; Over-sail

Project: Green Volt Floating Windfarm

Drawing Title: Candidate Transformer

SPA Location: Greens Road Junction

| | Name | Date |
|---|---|---|
| Drawn | TL | 06/07/2023 |
| Designed | GB | 05/07/2023 |
| Checked | GB | 05/07/2023 |
| Point of Interest | | 27 |

Scale: 1:500 @ A3

File No.: 230705 tracking.dwg

Drawing Status: Draft

Drawing No.: SK24

Notes:
1. All mitigation is subject to confirmation through a test run.
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GREEN VOLT

# Appendix 13.2

## Green Volt Framework TMP

Onshore EIA Report: Volume 3

Pell Frischmann

# Green Volt Onshore Infrastructure Development

## Framework Traffic Management Plan

August 2023

107749

| | | | | | | |
|---|---|---|---|---|---|---|
| **Report Ref.** | | **Framework CTMP_v2** | | | | |
| **File Path** | | **https://pellf.sharepoint.com/sites/EdinburghOfficeTeam/Shared Documents/General/Projects/107749 Flotation Energy Green Volt/01 - WIP/Reports/Green Volt TMP V2.docx** | | | | |
| **Rev** | **Suit** | **Description** | **Date** | **Originator** | **Checker** | **Approver** |
| V1 | | TMP – Draft for Client Comment | 18/07/2023 | E Moran | S Cochrane | S Cochrane |
| V2 | | TMP – Updated | 31/07/2023 | E Moran | S Cochrane | G Buchan |
| V3 | | TMP – Final | 02/08/2023 | E Moran | S Cochrane | G Buchan |
| | | | | | | |
| Ref. reference. Rev revision. Suit suitability. | | | | | | |

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FLOTATION ENERGY

Pell Frischmann

# Contents



**Figures**

## Tables



## Appendices

# 1 Introduction

## 1.1 Report Purpose

Pell Frischmann Ltd. (PF) has been commissioned by Flotation Energy Ltd., on behalf of Green Volt Offshore Windfarm Ltd. (the Applicant), to undertake a framework Construction Traffic Management Plan (CTMP) for the proposed Green Volt Onshore Infrastructure development (Proposed Development).



The report identifies the key transport management and routing associated with the construction of the Proposed Development, including the route for abnormal indivisible loads (AILs)

The following measures are considered in the framework CTMP:

- Proposed Development – including the Site location, description of the Proposed Development and an indicative Construction Programme;
- Access Strategy – including the location of the proposed access points, routes to Site, potential diversion routes and routeing management;
- Traffic Impact Mitigation Measures – including measures for a Core Path Management Plan, Staff Travel Plan, measures for construction traffic including signage strategy, providing information to the general public, measures for all traffic such as Site induction briefings;
- Wear and Tear Agreement – including procedures for road condition survey, interim survey, final survey and repairs; and
- Abnormal Load Assessment – including details on the abnormal loads to be delivered to the Site, abnormal load delivery vehicles, vehicle routeing, escort strategy and contingency plan.

The measures outlined in this framework document will be agreed with Aberdeenshire Council and Transport Scotland prior to construction works commencing. A finalised CTMP can then be secured by planning condition.

# 2 Proposed Development Description

## 2.1 Site Location

The Proposed Development is to be located between the proposed interface point for the offshore / onshore cabling to the north of Peterhead and the New Deer Substation, Turriff. The proposed Route Corridor of the Proposed Development is presented in Figure 1 below.

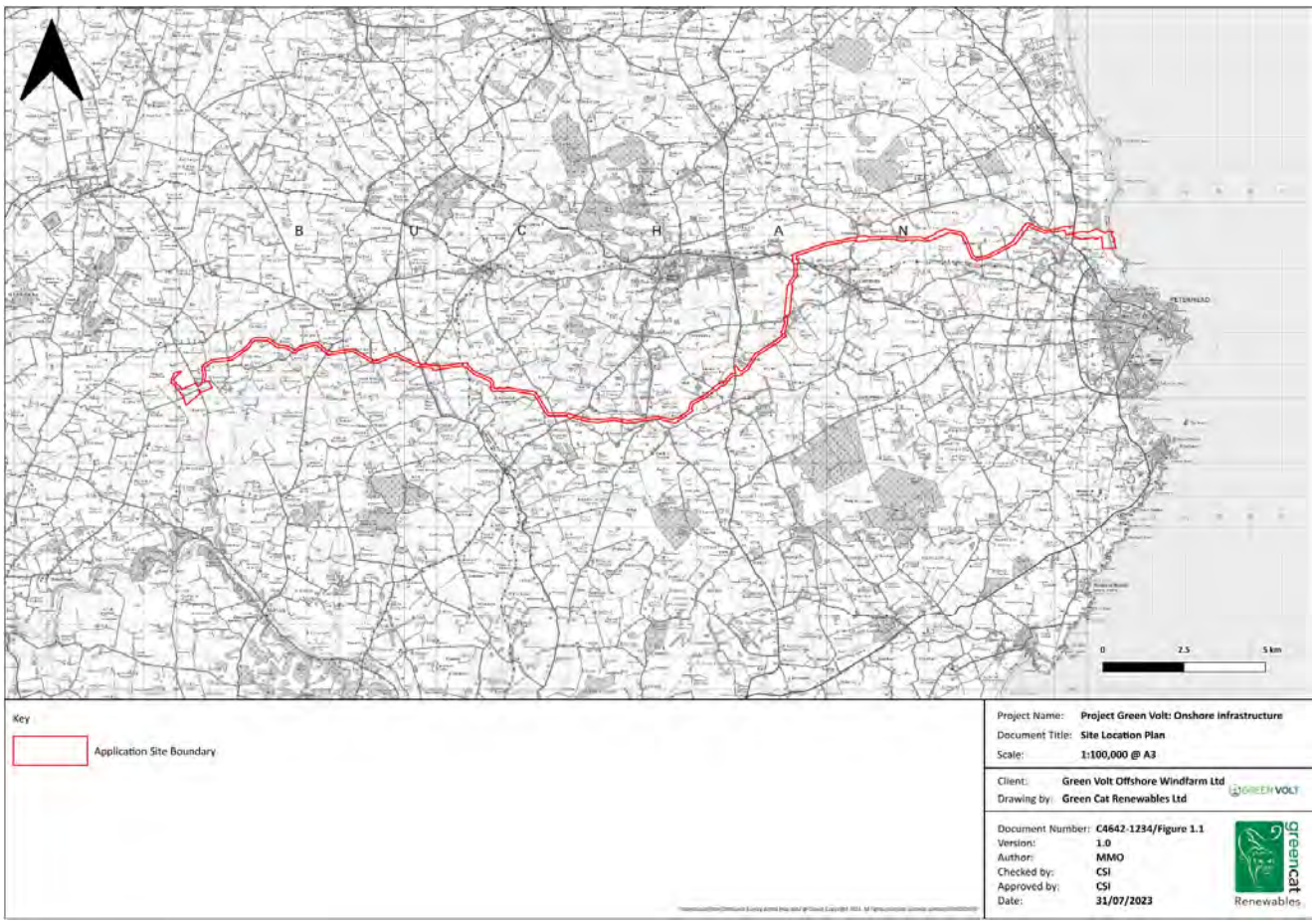


**Figure 1 Proposed Development Overview (courtesy of Green Cat Renewables)**

## 2.2 Proposed Development

In order to connect the proposed Green Volt Offshore Wind Farm to the national grid, a new buried export cable is required to connect the development at the offshore / onshore interface, to proposed new substation, located next to the existing New Deer Substation.

The Proposed Development therefore consists of electrical cables and a new substation, in addition to a small number of temporary work elements required as part of the installation process. The key elements of the Proposed Development are as follows:

- Landfall / Horizontal Directional Drilling (HDD) compound;
- Joint bays (underground);
- Electrical cables installed in a single trench;
- Temporary working area alongside trench;
- Temporary storage and welfare compounds that move along the cable route;
- Temporary compounds associated with trenchless crossings that move along the route; and
- A new substation with temporary storage and welfare compound.

The Proposed Development would have an operational life of 50 years.

## 2.3 Construction Programme

The construction works are expected to last for a 30 month period, with works commencing in 2025. The proposed construction activity programme is provided in Figure 2.

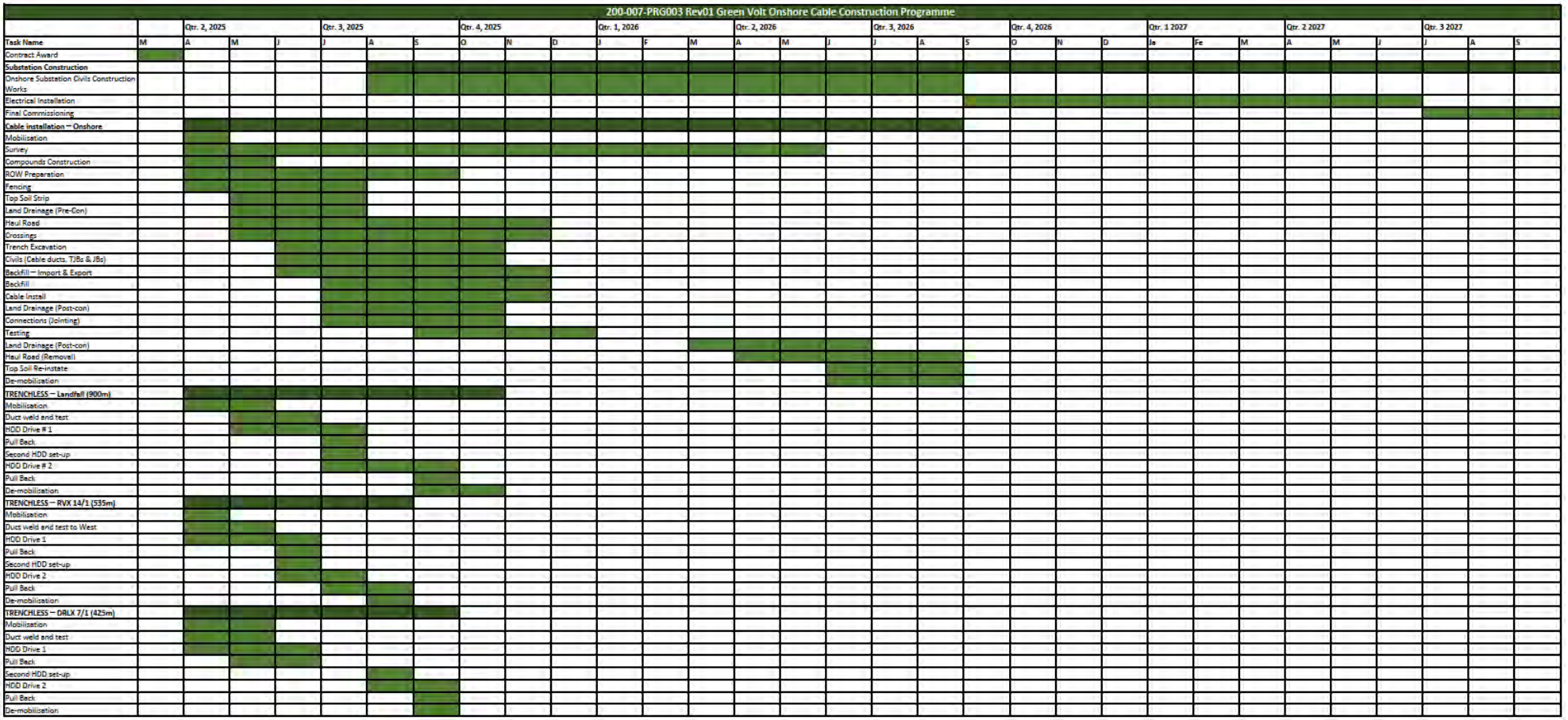


**Figure 2 Indicative Construction Programme**

Average monthly traffic flow data was used to establish the construction trips associated with the Proposed Development. The Applicant has undertaken a preliminary design of the Proposed Development and PF have estimated traffic movements based upon experience from similar projects. The construction programme and associated traffic movements over the 30 month construction period are illustrated in **Appendix 13.1: Transport Assessment**.

# 3 Access Strategy

It is proposed that the Site will be accessed by 20 access junctions along the proposed cable route. A total of 19 access junctions will be located on the local road network and a staggered access junction will be located on the A90 (T) on the trunk road network. The locations of the proposed access junctions are shown as Access Points in Figure 3.

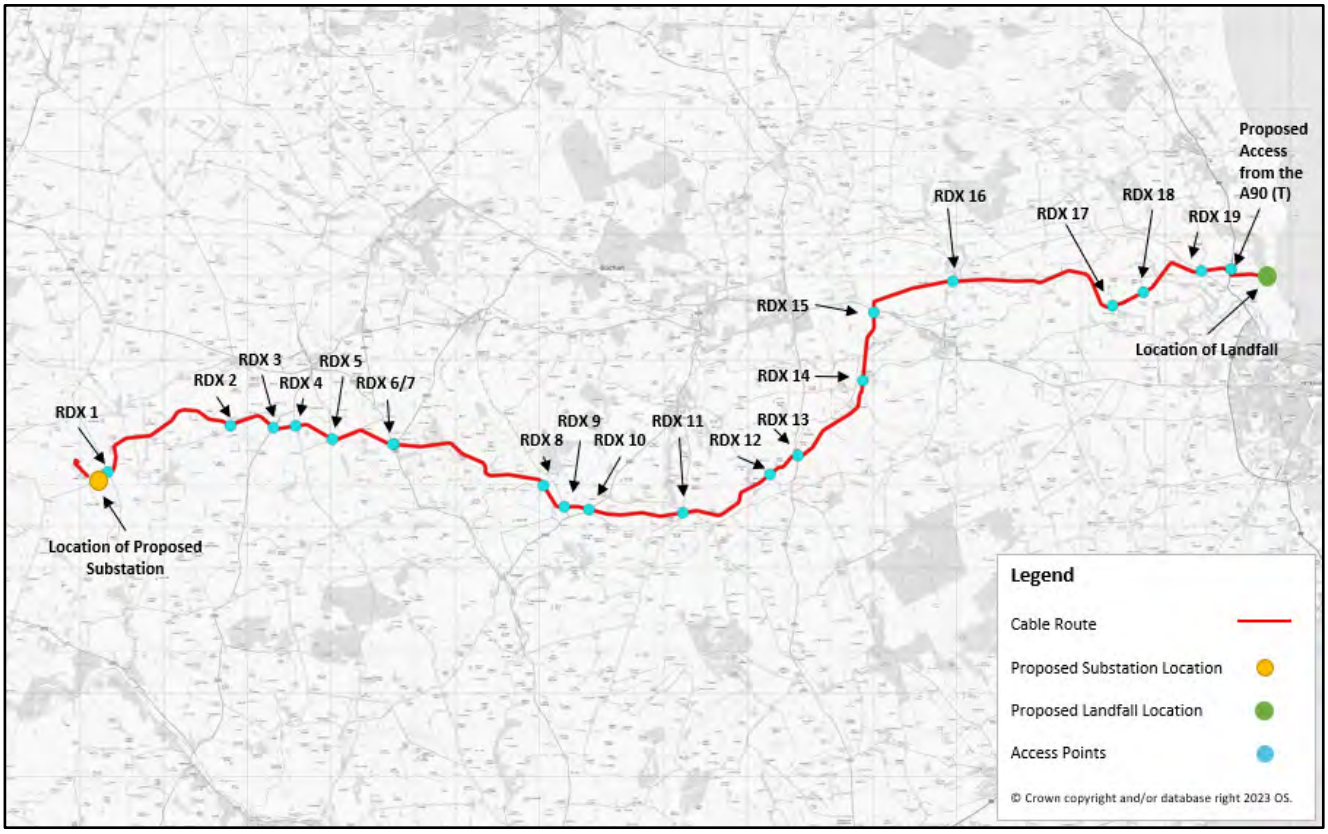


**Figure 3 Proposed Access Junction Locations**

Junction locations which are prefixed by RDX are to be located where the proposed cable route will cross roads on the local road network. The proposed location of the proposed junction accesses on the A90 (T) is to be approximately 465 metres (m) and 325 (m) north of A90 (T) / Unnamed road leading to Rora junction, respectively. The locations of the proposed access junctions are presented in Table 1.

**Table 1 Access Points**

| Access Point | Road Name | Location |
|---|---|---|
| RDX1 | Unnamed | Approx. 550 m south-east of New Deer Substation |
| RDX2 | Unnamed | Approx. 1.5 km east of Tillyfar |
| RDX3 | B9170 | Approx. 300 m south-west of Unnamed road (East of Tillyfar) / B9170 junction |
| RDX4 | Unnamed | Approx. 350 m south of B9170 / Unnamed road signed from Knaven |
| RDX5 | Lang Stracht | Approx. 1.65 km south of B9170 / Stoneybank Terrace junction |
| RDX6 | A948 | At A948 / B9106 crossroads |
| RDX7 | B9106 | At A948 / B9106 crossroads |
| RDX8 | Woodside | Approx. 1.6 km east of Kiddshill / Woodside junction |
| RDX9 | Unnamed | Approx. 260 m north of B9030 / Unnamed road signed for Maud junction |
| RDX10 | B9030 | Approx. 550 m east of B9030 / Unnamed road signed for Maud junction |
| RDX11 | Unnamed | Approx. 2.4 km south of B9030 / Mill Street junction (near Kinnadie) |

| Access Point | Road Name | Location |
|---|---|---|
| RDX12 | Unnamed | Approx. 60 m south-east of road signed as Milton of Clola / road to Stuartfield junction |
| RDX13 | A952 | Approx. 1.55 km south of A952 / Yokieshill Cottages crossroads |
| RDX14 | Yokieshill Cottage | Approx. 245 m south-west of Yokieshill Cottages / Inverquhomery Cottages junction |
| RDX15 | A950 | Approx. 1.55 km west of A950 / Nether Aden Road junction |
| RDX16 | Station Terrace | Approx. 685 m north of Bridgend Road / Station Terrace |
| RDX17 | Unnamed | Approx. 585 m north of Longside Airfield Industrial Estate |
| RDX18 | Unnamed | Class C road to the east of RDX 17 |
| RDX19 | Unnamed road leading to Rora | Approx. 800 m north-west of A90 (T) / Unnamed road leading to Rora junction |
| Proposed Access from the A90 (T) | A90 (T) | Western access approx. 465 m north of A90 (T) / Unnamed road leading to Rora junction and eastern access approx. 325 m north of A90 (T) / Unnamed road leading to Rora junction |

The proposed layout of a typical access junction provided on the local road network, as well as the proposed layout of the accesses along the A90 (T), are presented in Appendix A.

## 3.1 Routes to Site

The roads which are proposed to be used as delivery routes (within the Study Area) to the Main Construction Compounds, the Substation Compound and cable route access locations are presented in Figure 4.

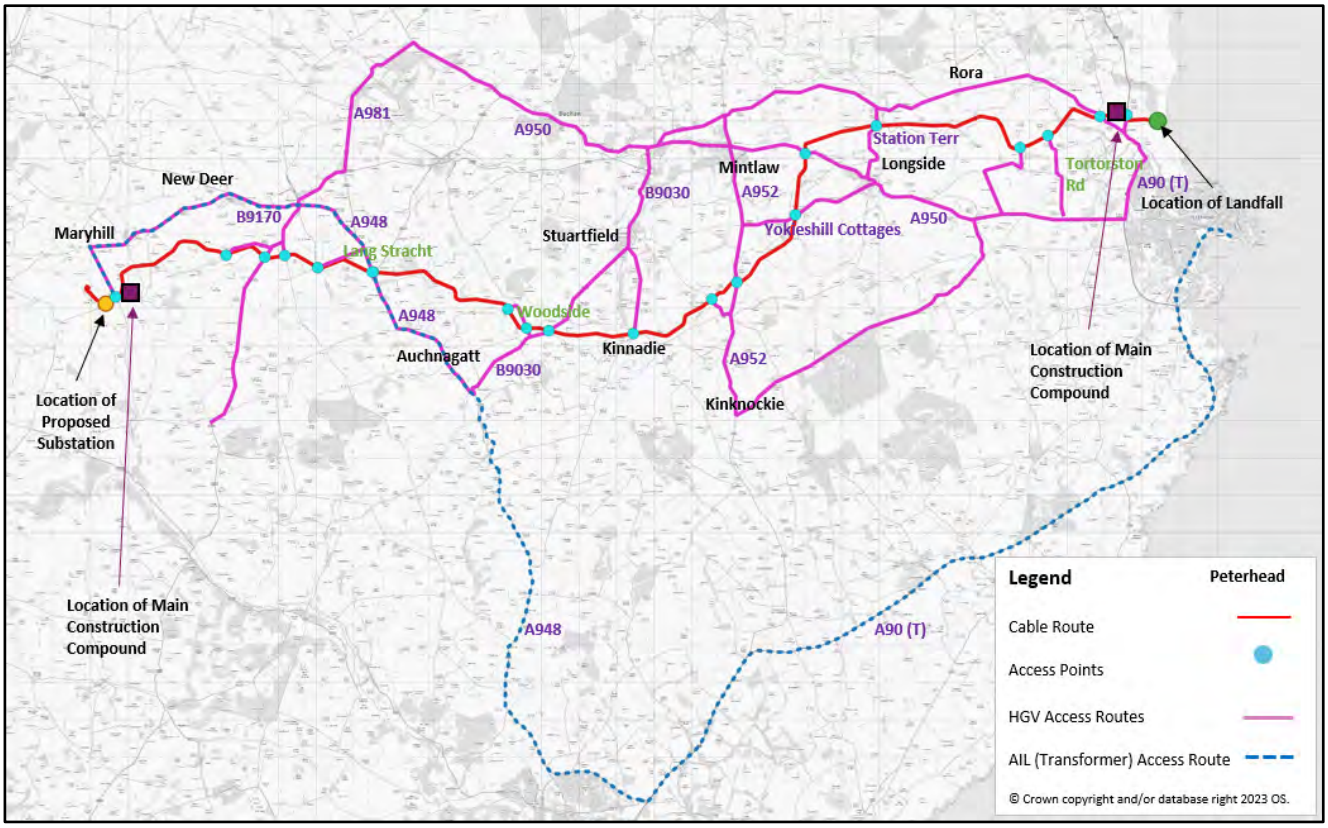


**Figure 4 Proposed Delivery Routes**

The route which the delivery vehicles will take to each of the access points will be dependent on the materials being delivered, however, it is proposed that these deliveries will travel along designated routes, as outlined above.

Staff are expected to be based locally and it is assumed that they will travel to the Main Site Compounds via A947 from Turriff, and via the A90 (T) where car parking facilities will be available. Staff will then be transported to the relevant area of the Site in work vehicles such as vans, 4x4 vehicles or minibuses.

## 3.2 Potential Diversion Routes

While is it proposed that the construction of the cable route will be undertaken by trenchless methods, there is a possibility that opencut methods may need to be undertaken at road crossing points RDX8 and RDX9. Should this be necessary, there may be a requirement for a temporary road closure to be put in place, with associated traffic management measures and diversion routes for existing road users.

If required, Temporary Road Closures will be made under the appropriate application with Aberdeenshire Council.

Potential diversion routes are illustrated in Figure 5.

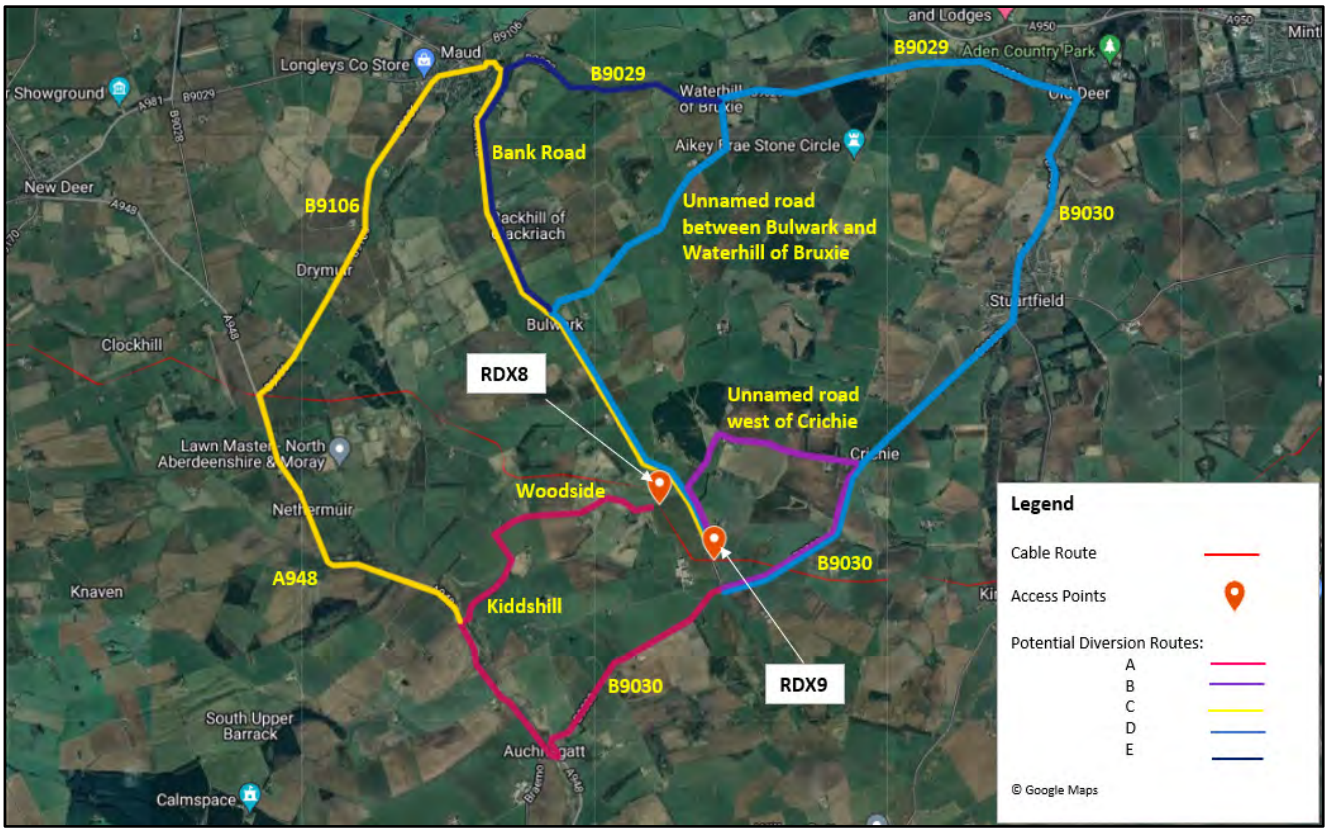


**Figure 5 Potential Diversion Routes**

The potential diversion routes are as follows:

- Potential Diversion Route A includes Woodside to the west of RDX8 and Kiddshill which leads to the A948.
- Potential Diversion Route B comprises a section of the road to the north of RDX9 and the unnamed road west of Crichie which leads to the B9030.
- Potential Diversion Route C consists of a section of the road to the north of RDX9, Bank Road, B9029 west of Bank Road / B9029 junction, B9106 south of B9106 / B9029 / Henry Lane junction and the A948 south of B9106 / A948 junction.
- Potential Diversion Route D comprises a section of the road to the north of RDX9, the unnamed road between Bulwark and Waterhill of Bruxie, B9029 to the east of Waterhill of Bruxie and B9030 south of B9029 / B9030 junction.

- Potential Diversion Route E consists of an alternative section of a diversion route to Potential Diversion Route D, where vehicles continuing traveling north along Bank Road and then B9029 east of Bank Road / B9029 junction before continuing on Potential Diversion Route D.

## 3.3 Route Management

All regular delivery contractors will be provided with a copy of the agreed CTMP. Drivers will be required to attend a Site induction briefing at which details of the Site and driving rules will be communicated. The utilisation of the agreed routes and the wider principles set out within the CTMP will be a requirement of any contractual agreement between the Applicant and the contractor assigned to import construction materials.

Emphasis will also be placed on courteous driving outside the Site on public roads. Both the Applicant and their appointed Principal Contractors will require regular delivery contractors to display unique identification on their vehicles so that any potential complaints from the Site or public can be investigated.

All deliveries will enter and exit the Sites via the identified access routes only. A banksman will assist in directing drivers to the delivery point within each Site area. Delivery drivers who have not previously been inducted will be given a visitor briefing at that point.

The relevant contractor will be required to implement induction procedures and regular updates for all drivers to establish and promote an overall culture of safety and awareness of other road users.

# 4 Construction Traffic Management Plan

## 4.1 Core Path Management Plan

Consideration will be given to pedestrians and cyclists alike due to potential interactions between construction traffic and users of the core path network in the vicinity of the Proposed Development. These measures will be formulated into a Core Path Management Plan.

The Principal Contractor will ensure that speed limits are always adhered to by their drivers and associated subcontractors. This is particularly important within close proximity to the core path network and at any crossing points, where there is the possibility of any interaction. Advisory speed limit signage will also be installed on approaches to areas where core path users may interact with construction traffic.

Signage will be installed on the Site exits that makes drivers aware of local speed limits and reminding drivers of the potential presence of pedestrians and cyclists in the area. This will also be emphasised in weekly toolbox talks.

With regards to the possible interaction between construction traffic and horses, the British Horse Society has previously provided comment and advice on this matter on similar projects. Consideration will be given to implementing measures that focus around the interactions between HGV traffic and horses. Horses are normally nervous of large vehicles, particularly when they do not often meet them. Horses are flight animals and will run away in panic if really frightened. Riders will do all they can to prevent this but, should it happen, it could cause a serious accident for other road users, as well as for the horse and rider.

The main factors causing fear in horses in this situation are:

- Something approaching them, which is unfamiliar and intimidating;
- A large moving object, especially if it is noisy;
- Lack of space between the horse and the vehicle;
- The sound of air brakes; and
- Anxiety on the part of the rider.

The British Horse Society recommends the following actions, that will be included in the Site training for all HGV staff:

- On seeing riders approaching, drivers must slow down and stop, minimising the sound of air brakes, if possible;
- If the horse still shows signs of nervousness while approaching the vehicle, the engine should be shut down (if it is safe to do so);
- The vehicle should not move off until the riders are well clear of the back of the HGV;
- If drivers are wishing to overtake riders, please approach slowly or even stop in order to give riders time to find a gateway or lay by where they can take refuge and create sufficient space between the horse and the vehicle. Because of the position of their eyes, horses are very aware of things coming up behind them; and
- All drivers delivering to the Site must be patient. Riders will be doing their best to reassure their horses while often feeling a high degree of anxiety themselves.

## 4.2 Staff Travel Plan

In order to reduce traffic impacts from construction personnel, all staff will be encouraged to utilise car-sharing and the use of crew buses wherever possible. A Staff Travel Plan will be provided and motorcycle and cycle parking facilities will be provided at the Site compounds.

## 4.3 Traffic Management Measures

Wherever reasonably possible, local suppliers such as quarries and concrete works are proposed to help minimise traffic levels of the network. Upon selection of the Principal Contractor, wider area routing information will be made available and final numbers of traffic movements confirmed.

The following measures would be implemented through the CTMP during the construction phase:

- Contractual requirement in the Balance of Plant contract that contractors will only use the agreed access routes. Failure to follow the traffic management measures proposed would be a contractual matter and could result in contractors being dismissed from the Site;
- Direction signage signposting traffic on the agreed access routes;
- Identification numbers of HGV and vans to allow easy recognition;
- Providing the public with details of how to report use of unapproved routes or driving issues of concern;
- Using GPS trackers to allow the monitoring of bulk delivery vehicle movements;
- Setting out Site staff disciplinary measures for those who ignore the agreed access routes and enforcing these throughout the construction period;
- All Site vehicles will feature “white noise” reversing warning devices to reduce noise disruption when on Site;
- All materials delivery lorries (dry materials) will be sheeted to reduce dust and stop spillage on public roads;
- Specific training and disciplinary measures will be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- Wheel cleaning facilities will be established at the Site entrances. A road sweeper would also be provided at Site to ensure that the road network is kept clean;
- Adoption of a voluntary speed limit of 20 mph for all construction vehicles through villages which include Longside, Mintlaw, Stuartfield, Old Deer, Auchnagatt, New Deer, Fyvie, Oldmeldrum and Methlick. It is not anticipated that HGV traffic will travel through Maud village;
- Site induction for all staff instructing them on what route to Site they can use to enter and exit the Site and obtaining their acknowledgement that there is only one approved access route. The induction would include:
    - A tool box talk safety briefing;
    - The need for appropriate care and speed control;
    - A briefing on driver speed reduction agreements (to slow Site traffic at sensitive locations through towns and villages on the route); and
    - Identification of the required access routes and access junction operation and the controls to ensure no departure from these routes.

A junction signage strategy will be prepared and agreed with Aberdeenshire Council and Transport Scotland prior to works commencing. The strategy will include the following:

- Direction signage to ensure vehicles keep to the approved construction traffic routes;
- Site access signage to advise other road users of increased movements at the junctions; and
- Chapter 8 (Traffic Signs Manual) “Slow Down” signage near the access junctions.

Regular maintenance will be undertaken at the sign locations to keep the plates clean and to ensure that verge vegetation does not obscure them.

## 4.4 Liaison Group

To assist with general traffic management proposals and measures during the construction period, it is proposed that a Traffic Management Group be formed to help advise of progress, issues and to feedback public comments. The suggested structure of this group would include, but would not be limited to the following:

- Local Road Manager from Aberdeenshire Council;

- Network Manager from Transport Scotland;
- Local ward elected members;
- A representative from the local Community Council(s);
- A representative from the Principal Contractor; and
- A senior member from the Applicant's team.

This group would help co-ordinate works and provide a robust conduit for information and issues that may arise. It is suggested that it would meet every two months during the construction period, although specific construction activities may warrant changes in frequency over that time.

Pages with information about the construction of the Proposed Development will be available on the project website. These will be updated throughout the construction period. If visitors to the Site are unable to find the answer to their question on the webpages, an email address will be provided on the project website to contact the Applicant. In addition, details will also be circulated via a newsletter advising about ongoing activities. A telephone number for the Principal Contractor would be published during operational hours to resolve any traffic management problems that occur and these calls would be logged and reported to the Applicant on a weekly basis to monitor the situation.

All contractors will be monitored through regular spot-checks to ensure they follow the approved access routes. Access Routes identified will be clearly defined in all sub-contracts and signposted.

Use of a visible vehicle identification system should be employed to ensure compliance with the agreed routes and driver behaviour standards. This will allow the public to identify any rogue vehicles to the Site office for easy recognition and review.

The Applicant will also create a protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic wherever possible.

## 4.5 Public Information

Information on AIL deliveries would be provided to local media outlets such as local papers and local radio to help assist the public.

Information would relate to expected vehicle movements from the Port of Entry (POE) through to the Site access junction. This will assist residents becoming aware of the movements and may help reduce any potential conflicts.

The Applicant would also ensure information was distributed through its communication team via the Project website, local newsletters and social media.

## 4.6 Turning Facilities & Banksmen

For safety reasons both onsite and for other road users, the Site accesses have been designed so all vehicles can enter and exit the Site in a forward gear. No vehicle shall reverse onto public roads and shall enter / exit the Site using forward gear only.

A banksman will be provided at the Site accesses to help guide traffic within the Site and to ensure health and safety access for the Site. The banksman will be in radio contact with the wider Site compound to advise of movements to and from the Site.

Upon completion of construction works, a gate will be provided on the access track leading to the substation. The gate will be set back from the public road to ensure that vehicles can stop at the gate without blocking back onto the public road.

## 4.7 Operational Phase Mitigation

Site entrance roads will be well maintained and monitored during the operational life of the development. Regular maintenance will be undertaken to keep the Site access track drainage systems fully operation and to ensure there are no run-off issues onto the public road network.

# 5 Wear & Tear Agreement

The wear & tear agreement will address concerns about possible damage to the public road, verges and structures. It will be based upon condition surveys of the road to ensure that the condition of the road does not deteriorate as a result of the construction works.

## 5.1 Road Condition Survey

A video footage survey of the pre-construction phase condition of the public will be undertaken prior to works commencing to ensure that an accurate review of the road condition is. The exact extents of the condition survey area will be agreed with Aberdeenshire Council prior to the survey being undertaken.

The High Definition (HD) baseline video review will be undertaken to review the road condition. This will include the carriageway, verge and street furniture. The condition survey would also feature still images for the survey and would measures specific defects to monitor their progression. Locations of points would be accurately logged using a GPS tracker.

To agree the current state of the road, the report would be agreed with the Council prior to construction works commencing.

## 5.2 Interim Surveys

Any immediate necessary repairs would be coordinated with the Council. Any damage caused by traffic associated with the Proposed Development, during the construction period that would be hazardous to public traffic, would be repaired immediately.

During construction activities, a general road wear and tear review would be undertaken every four months during construction. Interim reviews will be undertaken by the principal contractor on a regular basis and the progress reports issued to the Applicant.

Any damage to road infrastructure caused directly by construction traffic would be made good, and street furniture that is removed on a temporary basis would be fully reinstated.

There would be a regular road edge review and any debris and mud would be removed from the public carriageway to keep the road clean and safe during the initial months of construction activity, until the construction junction and immediate access track works are complete.

Where defects occur, the principal contactor will ensure that they maintain a stockpile of road repair material on site to undertake repair works quickly and efficiently, when authorised by the Council to undertake interventions.

## 5.3 Final Survey

Upon completion of construction activities, a follow-on condition review will be undertaken within four weeks of the site being substantially complete and a defects list prepared. Works required to reinstate the road back to its original condition would be undertaken at the Applicant's expense following a review by the Council.

## 5.4 Repairs

Where there are cases where defects will need to be undertaken quickly and the contractor will have arrangements in place to respond to serious and significant defects within agreed hours.

# 6 Abnormal Load Movements

## 6.1 Abnormal Indivisible Loads (AIL)

The UK Government describes an AIL as *"any load that cannot be broken down into smaller loads without undue expense or risk of damage".* AIL movements remain a reserved matter for the UK parliament.

There are four main pieces of legislation that cover AIL movements as defined by the Government.

- The Road Vehicles (Construction & Use) Regulation 1986;
- This covers all aspects of the vehicles setup from the weights and dimensions through to the braking system and environmental standards.
- The Road Vehicles (Authorised Weight) Regulations 1998;
- This regulation sets the limited maximum weight of the vehicle and axle loading of different vehicle categories.
- The Road Vehicles (Authorisation of Special Types) (General) Order 2003;
- The STGO is for vehicles not covered by either of the above Regulations and covers wind turbine component delivery vehicles which are categorised as N3 for the tractor units and O4 for the specifically designed trailers. It states that the Police, the relevant highway and bridge authorities or the Secretary of State may need to be notified of vehicle movement, dependent on the size of the load.
- Notifications can be made online through the 'Highway Agency's Electronic Service Delivery for Abnormal Loads (ESDAL) System' or in paper form using the BE16 form for Special Orders.
- The Road Vehicles Lighting Regulation 1989 (Authorisation of Special Types) (General) Order 2003;
- This regulation defines whether front, side and rear lamps and reflectors are mandatory and which ones are permitted and which are not permitted.

Applications for a 'Vehicle Special Order' (VSO) should be made to the Vehicle Certification Agency (VCA) and it is recommended that applications are applied for at least 8 weeks prior to planned vehicle movements.

To support the movement of abnormal loads the Police may be required to stop other traffic. In order to bolster existing powers, a Temporary Traffic Regulation Order (TTRO) will be required to cover the delivery period to allow the Police to stop and redirect where necessary.

## 6.2 Proposed Loads

To allow the proposed offshore windfarm to connect to the national electrical grid, new transformers will be required. These transformers will be located within the Substation Compound and due to their size and weight are classified as AIL.

Details of the proposed transformer loads will be confirmed at the detailed design stage of the project, post planning determination. To provide an initial review of access it has been assumed that the transformers will be no larger than those used for the neighbouring Moray East project and that the same access route from the Port of Peterhead will be used.

The candidate transformers have a maximum transport weight of 275 tonnes. The loads would be a maximum of 11.5 m in length by 4 m in width by 4.6 m in height. These represent a worst case load and are likely to reduce in scale when the proposed Substation Site is constructed.

To transport loads such as these a two bolster girder frame trailer is to be used, as per the Moray East deliveries. This has ten axles in the front and rear bolster with the load suspended between. An example trailer is illustrated in Figure 6.

**Figure 6 Example Transformer Load Transporter**

The combined weight of the trailer when loaded is 410 tonnes, with an axle loading of 18.8 tonnes.

Various road improvements would be required to enable access. These enhancements are noted in the following sections, however no detailed design options have been undertaken as yet. These would generally be progressed once the Applicant has selected their final preferences for equipment.

The access options have only considered access to the proposed Substation Site boundary. Access within the Site has not been considered at this time.

## 6.3 Route Surveys

A Route Survey Report (RSR) has been prepared in relation to the movement of AILs associated with the transformers from the POE to the Substation Site and is presented in **Appendix 13.1 Transport Assessment**. The report identifies the key issues associated with AIL deliveries from the Port of Peterhead to the proposed Substation Site and notes that remedial works, either in the form of physical works or as traffic management interventions, will be required to accommodate the predicted loads.

## 6.4 Management Measures

There are a number of traffic management measures that could help reduce the effect of AIL deliveries.

All AIL deliveries would be undertaken at appropriate times (to be discussed and agreed with the relevant roads authorities and police) with the aim to minimise the effect on the local road network. It is likely that the AIL convoys would travel in the early morning periods, before peak times while general construction traffic would generally avoid the morning and evening peak periods.

The majority of potential conflicts between construction traffic and other road users will occur with AIL vehicles. General construction traffic is not likely to come into conflict with other road users as the vehicles are smaller and road users are generally more accustomed to them.

Advance warning signs would be installed on the A90 (T) and Aberdeenshire Council road network. Information signage could be installed to help assist drivers and an example is illustrated in Figure 7. Flip up panels (shown in grey) would be used to mask over days where convoys would not be operating. When no convoys are moving, the sign would be bagged over by the Traffic Management contractor.

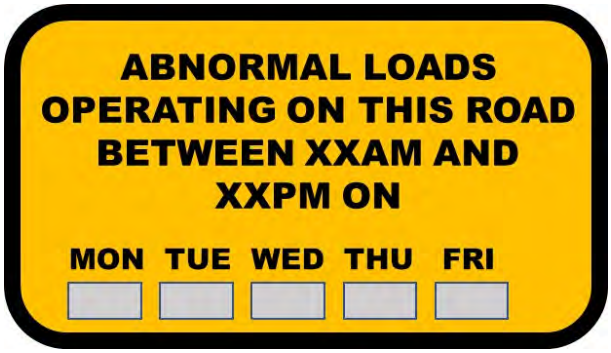


**Figure 7 Example Information Sign**

This signage will assist in helping improve driver information and allow other road users to consider alternative routes or times for their journey (where such options exist).

The location and numbers of signs would be agreed post consent and would form part of the wider Traffic Management Proposal for the Proposed Development.

The Abnormal Load Transport Management Plan would also include:

- A diary of proposed delivery movements to liaise with the communities to avoid key dates such as local events;
- A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic; and
- Proposals to establish a construction liaison committee to ensure the smooth management of the project / public interface with the Applicant, the construction contractors, the local community, and if appropriate, the police forming the committee. This committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.

## 6.5 AIL Traffic Management Measures

AIL movements must be escorted by the Police. Given the size of the proposed loads, it is expected that at least three private escorts and a minimum of two police escort vehicles are likely to be required (exact requirement will be confirmed with the police). The likely deployment of escorts will be as follows:

- The first police escort vehicle will be the advance escort and will be located sufficiently ahead of the convoy, to advise the convoy in good time of traffic stoppages, constraints and oncoming hazards;
- The second police escort and first civilian escort will provide support to the first escort at junction closures and would be located at the front of the lead vehicle; and
- The second civilian escort will be located behind the last vehicle to protect the rear of the convoy and ensure that following vehicles do not attempt dangerous overtaking manoeuvres. A third escort will be located at this location to provide support at the rear if the convoy and to prevent dangerous overtaking.

Before the convoys depart the POE, the Lead Driver should check weather and traffic conditions and ensure this information is included within the daily toolbox talks.

There will be locations where general traffic flows will need to be stopped to allow the safe manoeuvre of the loads. In these circumstances the advance escorts will ensure that the traffic is stopped before the convoys enters the affected section. The advance escorts will confirm through radio contact that the area is clear and safe for transit. Should general traffic fail to observe the request to stop, the advance escort will advise the convoy to immediately halt and will then proceed to remove the rogue traffic. The convoy must not start without approval from the advance escort.

In areas where the load is likely to, or is close to straddling the centre line, the advance escort should be positioned to give advance warning to the convoy such that evasive action can be taken. In constrained areas

and other locations where verges are potentially soft the drivers must exercise care to ensure the trailer wheels do not leave the road surface as this may result in adverse load stability conditions.

Urban areas along the route pose different challenges for the abnormal loads. Whilst the vehicle speeds will be less than those in the rural sections of the route, there are more potential conflicts with other road users to be aware of. These include:

- Pedestrians and cyclists;
- Local vehicular traffic;
- Parked vehicles;
- Side junctions; and
- Street furniture.

Within urban areas, the convoy escorts will need to be aware of all road and footway users at turn sections within the route. At these locations there is potential for load over-sail and reference to the swept path assessment drawings is considered essential to identify these areas. It is important to note that only the Police have the power to request that vehicles and pedestrians move.

Within urban areas there is a higher chance of parked vehicles along the route and a possibility that parked cars will restrict available road width. Whilst these areas will not impede the loads they do create a further zone where the load drivers and escorts will need to take care of conflicts that include restricted road widths, car doors opening and pedestrians crossing the road between parked vehicles.

Information relating to AIL movements will be provided directly to residents living in the immediate vicinity of the access route. Information on the movement of the abnormal load convoys would also be provided to local media outlets by the Principal Contractor (or their appointed AIL delivery contractors) to help assist the public. Information would be provided to local newspapers and radio stations.

The Applicant / Principal Contractor will commit to ensuring that reasonable notice is given to local residents and communities regarding any potential disruption

The project website will also be used to help advise of movements. Information would relate to expected vehicle movements on the route. It is hoped that this level of information will make residents aware of convoy movements and help reduce any conflicts.

## 6.6 AIL Convoy Health & Safety Measures

All staff working on the project will be inducted before entering the Site. This will be undertaken prior to the commencement of AIL movements.

A daily Tool Box Talk for all convoy staff to be held at the start of each working day and carried out by the appointed Transport Co-ordinator or Appointed Lead Driver. A detailed record of the talk should be kept and filed once the convoy has arrived at the Site.

The Tool Box Talks will cover a minimum of the following matters:

- The current version of the CTMP to be carried by all convoy vehicles;
- Identification of any updates since the previous version of the CTMP;
- Requirement to have a CB radio (fixed or portable), with fully charged batteries;
- Anticipated transport restrictions in each section of the route;
- Driver instructions on incident reporting;
- Driver instructions on trailer steering methodology, and availability of assistance;
- Instructions on areas requiring traffic stoppage, and methodology for convoy passing through these areas;
- The welfare arrangements for drivers;

- A summary of the predicted weather, traffic and road conditions; and
- Any questions on the contingency plans.

Each of the convoy vehicles must be suitably equipped with hazard warning devices to warn all other road users. All the tractor, trailer and escort vehicles operating on the project must have the following:

- Tractor units to have beacon bars on the roof and 3M reflective markings on both sides;
- All vehicle warning signage to be in English;
- Trailer units to have amber beacons on the rear with 3M reflective markings on both sides;
- All escort vehicles will have beacon bars on the roof, with 360 degree motion for all round visibility, and 3M reflective markings;
- Fire extinguisher and first aid kit; and
- Certified cargo lashing straps are to be used at all times. Certification must be carried and made available for inspection, kept within the cab.

All hazard warning equipment must be checked and cleaned at the start of each day. Additional cleaning of the warning equipment may be required throughout the day and must be undertaken when required.

All relevant personnel must have the appropriate Personal Protective Equipment (PPE). All PPE clothing must be 'CE' marked to show it meets current standards and should be appropriate for use in trunk road situations (i.e. must be full coats with reflective bands on the arms).

## 6.7 Emergency & Contingency Plan

To ensure access for emergency service vehicles, a coordination protocol will be established with the blue light emergency services. As the AIL convoys are escorted by the Police, the Police will be aware of potential access issues for ambulances and fire service vehicles and can take appropriate action on the route to pull to the side of the road or mount a verge to allow emergency vehicles past.

The civilian escort vehicles carry equipment to make running repairs to vehicles in the unlikely event of a breakdown. Further spares and equipment can also be based at the Site for faster responses in case of mechanical issues.

The haulier will establish contracts with local suppliers to attend to any punctures and tyre issues, to minimise any stoppage time on the route.

# Appendix A Indicative Junction Layouts

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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Onshore Infrastructure Development

Drawing Title: Indicative Junctions

SPA Location: A90 Staggered Junctions

| | Name | Date |
|---|---|---|
| Drawn | SCM | 18/07/2023 |
| Designed | SC | 18/07/2023 |
| Checked | SC | 18/07/2023 |
| Point of Interest | | 1 |

Scale: 1:1000 @ A3

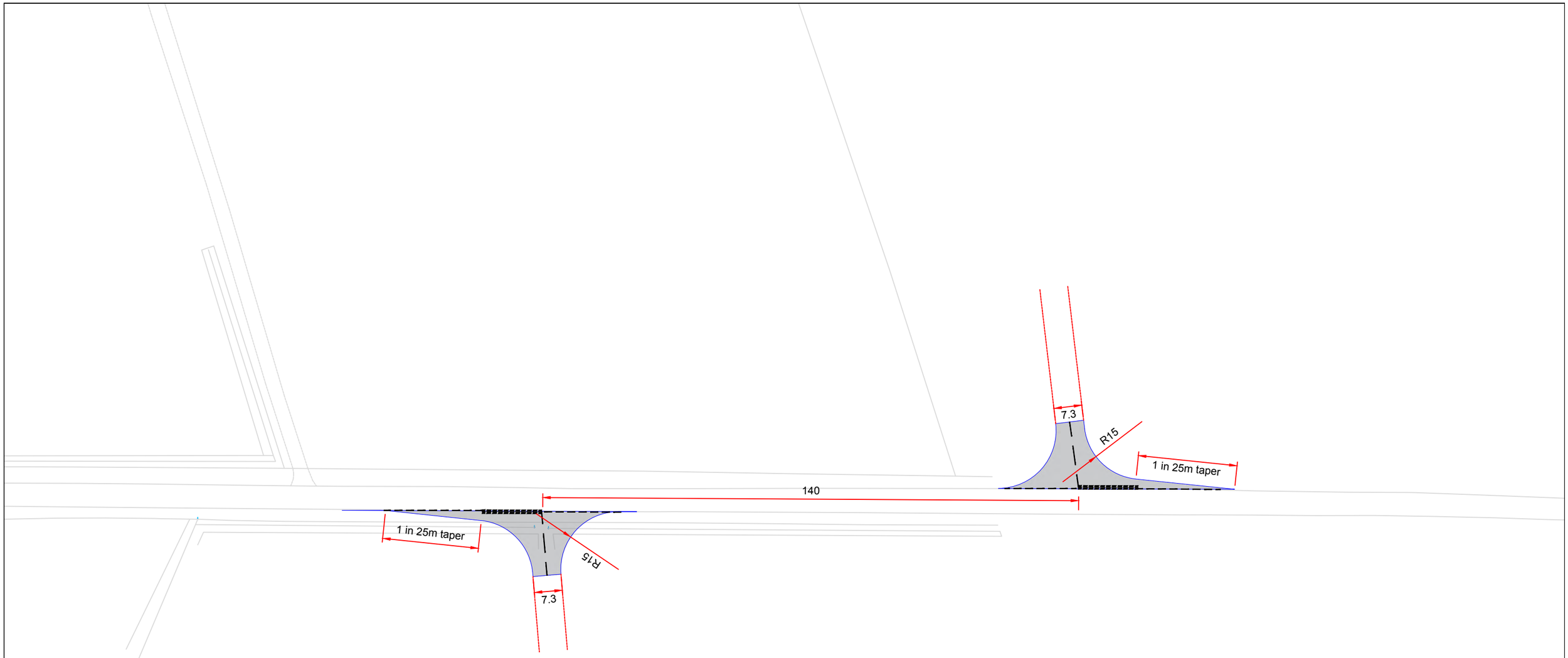
File No.: 230718 Junctions.dwg

Drawing Status: Draft

Drawing No.: SK01

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0



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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Onshore Infrastructure Development

Drawing Title: Indicative Junctions

SPA Location: A90 Staggered Junctions

| | Name | Date |
|---|---|---|
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| Designed | SC | 18/07/2023 |
| Checked | SC | 18/07/2023 |
| Point of Interest | | 1 |

Scale: 1:1000 @ A3

File No.: 230718 Junctions.dwg

Drawing Status: Draft

Drawing No.: SK01A

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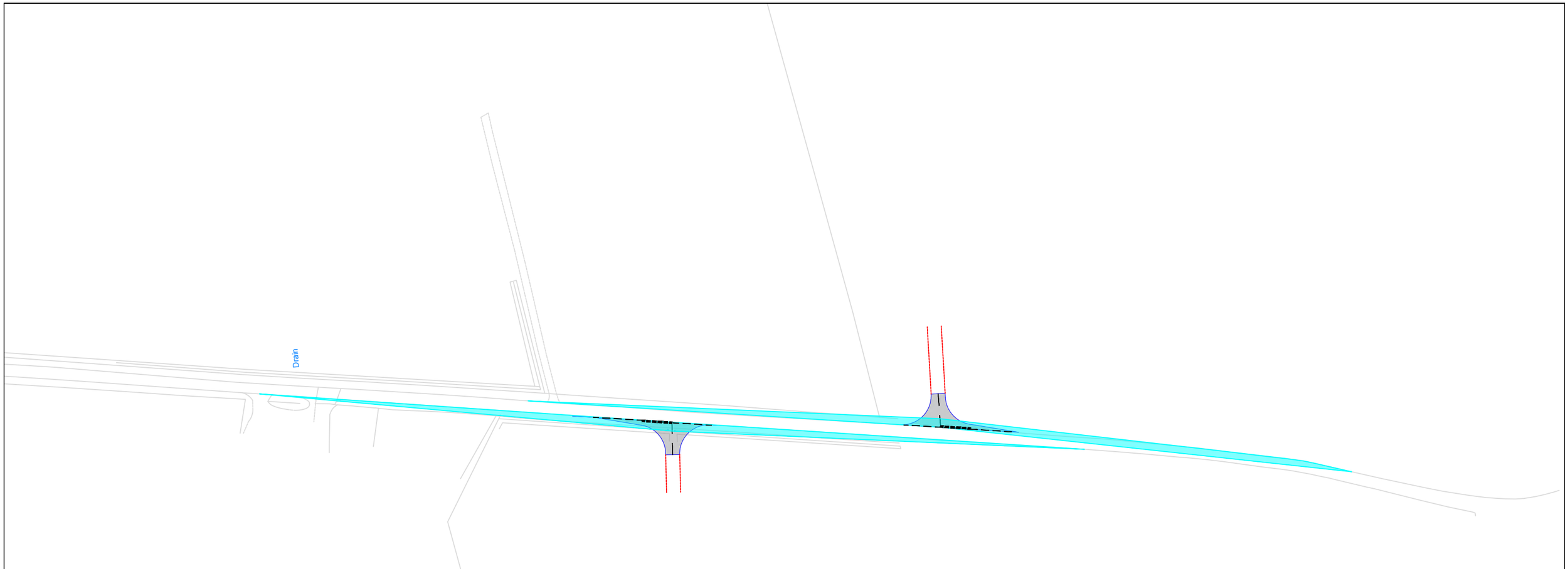




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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Onshore Infrastructure Development

Drawing Title: Indicative Junctions

SPA Location: 4.5mx 215m Visibility Splay A90 Staggered Junctions

| | Name | Date |
|---|---|---|
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| Designed | SC | 18/07/2023 |
| Checked | SC | 18/07/2023 |
| Point of Interest | | 2 |

Scale: 1:2000 @ A3

File No.: 230718 Junctions.dwg

Drawing Status: Draft

Drawing No.: SK02

Notes:
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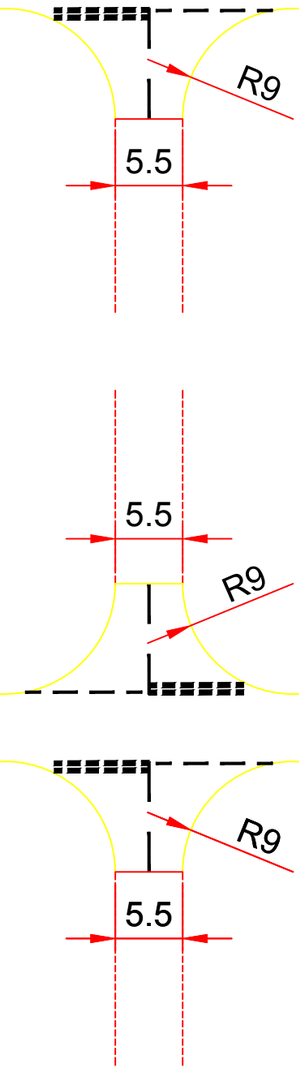
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0



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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over–run | Over–sail

Project: Green Volt Onshore Infrastructure Development

Drawing Title: Indicative Junctions

SPA Location: Indicative Single Access and Crossing Layout

| | Name | Date |
|---|---|---|
| Drawn | SCM | 18/07/2023 |
| Designed | SC | 18/07/2023 |
| Checked | SC | 18/07/2023 |
| Point of Interest | | 2 |

Scale: 1:500 @ A3

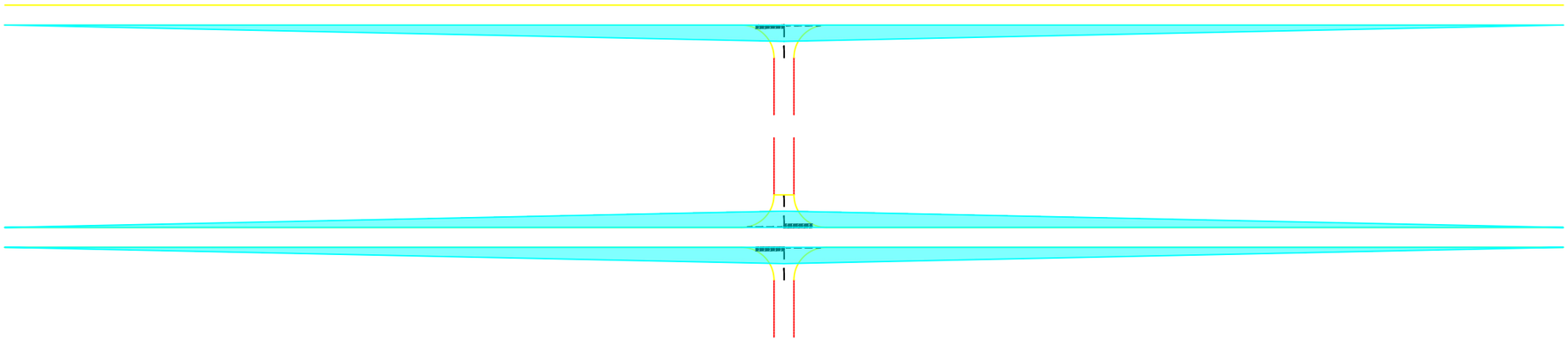
File No.: 230718 Junctions.dwg

Drawing Status: Draft

Drawing No.: SK03

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0





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Client: Flotation Energy Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Green Volt Onshore Infrastructure Development

Drawing Title: Indicative Junctions

SPA Location: Indicative Single Access and Crossing Layout 4.5m x 215m Visibility Splay

| | Name | Date |
|---|---|---|
| Drawn | SCM | 18/07/2023 |
| Designed | SC | 18/07/2023 |
| Checked | SC | 18/07/2023 |
| Point of Interest | | 2 |

Scale: 1:1500 @ A3

File No.: 230718 Junctions.dwg

Drawing Status: Draft

Drawing No.: SK04

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: 0

GREEN VOLT

# Appendix 16.1

## Greenhouse Gas Methodology

Onshore EIA Report: Volume 3

| Document Code: FLO-GRE-REP-0009-16 | | |
|---|---|---|
| **Version Number:** | 00 | |
| **Date:** | *Issue Date 03/08/23* | |
| **Prepared by:** | PBO | *PBO* |
| **Checked by:** | JP | *JP* |
| **Approved by Client:** | Tracey Clarkson-Donnelly | *Tracey Clarkson-Donnelly* |

| Version Number | Reason for Issue / Major Changes | Date of Change |
|---|---|---|
| 00 | Issue for client review | 03/08/23 |
| | | |
| | | |

# Contents

# Table of Tables

# Acronyms

| Acronym | Description |
|---|---|
| AIL | Abnormal Indivisible Loads |
| BEIS | Department for Business, Energy and Industrial Strategy |
| DESNZ | Department for Energy Security and Net Zero |
| DfT | Department for Transport |
| DRLX | Dismantled Rail Crossing |
| EIA | Environmental Impact Assessment |
| GHG | Greenhouse Gas |
| GRP | Glass Reinforced Plastic |
| HDD | Horizontal Directional Drilling |
| HGV | Heavy Goods Vehicles |
| IAC | Inter-Array Cable |
| ICE | Inventory of Carbon and Energy |
| MWHS | Mean High-Water Springs |
| MWLS | Mean Low Water Springs |
| NRMM | Non-Road Mobile Machinery |
| OSP | Offshore Substation Platform |
| RVX | River Crossing |
| WTG | Wind Turbine Generators |
| XLPE | Crosslinked Polyethylene |

# 16 GHG Methodology

## 16.1 Introduction

1. This Appendix sets out further technical details for the Greenhouse Gas (GHG) Assessment methodology presented in **Chapter 16: Greenhouse Gas Assessment**. As detailed in **Chapter 16: Greenhouse Gas Assessment**, the chapter presents the impacts of the Proposed Development to climate change through the GHG assessment. Specificcally, the chapter considers the potential impact of the Proposed Development during its construction, operation and maintenance, and decommissioning phases.

**2.** As detailed in **Section 16.1** of **Chapter 16: Greenhouse Gas Assessment**, the GHG assessment for the Offshore Project, which includes offshore infrastructure seaward of the Mean High-Water Springs (MHWS) is presented in the Offshore Environmental Impact Assessment (EIA) report. It is expected that the Offshore Project would be the most intensive in GHG terms.

**3.** This Appendix includes the methodology for quantifying the GHG emissions from:

- The Proposed Development (i.e embodied emissions in materials, road traffic movement, and plant and equipment) (see **Section 16.2.3)**.
- The Proposed Development in-combination with the Offshore Project (i.e. offshore embodied emissions in materials and marine vessel movements) (see **Section 16.2.1**).

## 16.2 GHG Assessment Methodology

### 16.2.1 Embodied emission in Onshore Project materials

4. Emission of 'cradle to (factory) gate', a term which includes the extraction, manufacture and production of materials until they leave the factory gate at the final processing location, were calculated for the Proposed Development. GHG emissions were derived from quantities or volumes of known materials that will be used in construction of the Proposed Development, including the following infrastructure:

- Horizontal Directional Drilling (HDD) compound;
- Transition joint bays
- Electrical cables; and
- Substation Compound

5. To provide a precautionary assessment, it was assumed that there will be no reduction in the emission intensity during abstraction and manufacturing of materials up until and during the construction phase of the Proposed Development. This is likely to be a conservative approach, as the earliest that construction of the Proposed Development would commence is anticipated to be 2025, where the emission intensity of some sectors such as transport and industry is likey to have decreased.

6. The relevant emission factors sources were obtained from the Inventory of Carbon and Energy (ICE) database (Jones & Hammond, 2019) where possible, which are considered to be representative of emboided carbon within typical construction materials within the UK. Alternative sources for emission factors were used for more specific components to wind farms and are detailed in this Appendix where applicable.

7. Precautionary assumptions were adopted with respect to material quantities to be used for each component of the Proposed Development, which includes contingency allowing for the worst-case scenario of the maximum design envelope to be accounted for. It has also been assumed that virgin materials will be used, whereas the Proposed Development may seek to use recycled sources for some of the components.

8. The emission factors used in the GHG Assessment for embodied emissions in onshore construction materials are presented in **Table 16-1**.

*Table 16-1 Emission Factors for Embodied GHGs in Onshore Materials*

| Material | Emission Factor (kg CO2e/kg, unless otherwise stated) | Source |
|---|---|---|
| Aluminium | 6.67 | ICE Database v3.0 November 2019 (Jones & Hammond, 2019) |
| Concrete | 0.10 | |
| Copper | 2.71 | |
| Glass reinforced plastic (GRP) – Fibreglass (proxy) | 8.1 | |
| Iron (cast iron proxy) | 2.03 | |
| Nylon | 9.14 | |
| Steel (average) | 2.47 | |
| Armouring (cable) | 1.46 | Cableizer (n/a) |
| Lead (cable) | 1.67 | |
| Polyethylene sheath or filler cable | 2.54 | |
| Polypropylene yarn | 3.69 | |
| Semi-conductor (proxy) (cable) | 1.49 | |
| Crosslinked polyethylene (XPLE) (cable) | 1.93 | |

### 16.2.2 Road Vehicles

9. Road vehicle movements associated with the construction, and operational and maintenance phases of the Proposed Development will result in the release of GHG emissions. GHG emissions were calculated from an estimation of the total kilometres travelled by heavy goods vehicles (HGVs) and staff transport (cars) to and from the onshore construction sites, and also during the operation and maintenance phase.

10. The total distance travelled during the construction phase was calculated based on the assumed average trip length (two-way movement) of 10km for cars and 50km for HGVs for each vehicle movement, which were considered to be reasonable assumptions for the study area. To provide a conservative assessment, the fleet make up (in terms of fuel and Euro standards) for the earliest year of construction (2025) was used in the assessment for staff transport.

11. Emission factors for each vehicle type considered in the Assessment were obtained from DESNZ (formerly BEIS) (2023), in units of kg $CO_2e$ per km travelled. To provide a conservative assessment, it was assumed that there were no fuel efficiency improvements or reductions in emissions over the construction phase of the Project for each mode of transport.

12. Vehicle movements during the construction phase, used to calculate the GHG emissions are provided in **Table 16-2**.

*Table 16-2 Construction Phase Traffic Movements*

| Variable | Units | HGV | Light Vehicles (staff travel) |
|---|---|---|---|
| Vehicle movements | Trips | 99,948 | 35,971 |
| Distance travelled per trip | km | 50 | 10 |
| Total distance travelled | km | 4,997,400 | 359,710 |

13. The forecasted 2025 fleet composition (i.e. proportion of diesel, petrol and electric cars) was obtained from the Department for Transport (DfT) WebTAG data v1.21 (DfT, 2023). The proportion of diesel, petrol and electric cars in the UK fleet for 2025 was obtained from the DfT (2023) to determine a representative emission factors associated with staff travel. The fleet composition used in the assessment, and emission factors associated with each vehicle type are provided in **Table 163-.**

*Table 16-3 Calculation of Emission Factor used for Light Vehicles in this Assessment*

| Earliest year of construction | Fleet composition (DfT, 2023) | | | Vehicle emission factor (kg $CO_2e$/km) (DESNZ, 2023) | | | Emission factor used in assessment (kg $CO_2e$/km) |
|---|---|---|---|---|---|---|---|
| | Diesel | Petrol | Electric | Diesel | Petrol | Electric * | |
| 2025 | 35.7% | 49.6% | 14.7% | 0.17 | 0.164 | 0.066 | 0.152 |
| * Assumed to be plug-in hybrid electric vehicles, as battery electric vehicle has 0 $CO_2e$ emissions in the 2023 DfT dataset | | | | | | | |

14. It was assumed that all HGVs used for the Proposed Development would be diesel powered. The emission factor for HGV movements (50% laden) was obtained from DESNZ (2023) and was 0.81 kg $CO_2e$/km. In the absence of suitable empirical data, it was assumed that the fleet composition of HGVs did not change over the temporal scope of the assessment to provide a precautionary approach.

15. It was assumed that during the operation and maintenance phase of the Proposed Development, traffic movements would be limited to those generated by the daily operation and periodic maintenance at the Proposed Onshore Substation, and at link boxes along the onshore cable route corridor. It was therefore assumed that there would be two traffic movements (i.e. one visit) per week during the 35 year operational phase of the Proposed Development. This visit was assumed to be a 20 km round-trip, i.e. 10 km each way.

### 16.2.3 Plant and Equipment

16. Fuel consumption associated with the operation of non-road mobile machinery (NRMM) for the Proposed Development was calculated based on the estimated use of each item of plant and equipment during construction. An indicative list of plant and equipment types that would be utilised during construction activities at landfall, along the onshore cable route corridor and at the Proposed Onshore Substation as provided by the Applicant. Further assumptions were made regarding the number and specification of each type of plant, based on information derived for other projects of a similar nature.

17. The anticipated fuel demand by NRMM during construction of the Proposed Development was calculated using these assumptions, and the emission factor for gas oil was obtained from DESNZ (2023) to derive GHG emissions.

18. The following assumptions were adopted in the assessment, which were obtained from projects of a similar nature in the absence of detailed inforamtion specific to the Proposed Development:

    - Plant and equipment were assumed to operate throughout the consented working hours for the

Project (12 hours per day). On-time factors were applied for each plant and equipment.

- To provide a conservative assessment, the construction plant and equipment were all assumed to use gas oil which has an emission factor of 0.2565 kg $CO_2e$/kWh (DESNZ, 2023).
- Engine sizes for plant and equipment were either provided by the Applicant or obtained from manufacturer specifications for NRMM typically required during construction activities. It was assumed that engines operated at a load factor of 75%.

19. A summary of the onshore construction activities and the associated durations (as obtained from the currentconstruction programme for the Onshore Project) is detailed in **Table 16-4.**

*Table 16-4 Proposed Development Construction Activities and Schedule*

| Construction Activity | Duration (days) |
|---|---|
| Cable Installation - onshore | 361 |
| Trenchless Landfall (900m) | 124 |
| Trenchless - RVX 14/1 (535m) | 94 |
| Trenchless - DRLX 7/1 (425m) | 114 |
| Substation | 546 |

20. Indicative plant and equipment used during the construction of the Proposed Development are provided below in **Table 16-5.**

*Table 16-5 Indicative Proposed Development Plant and Equipment Requirements*

| Indicative Construction plant and equipment | Indicative number required | | |
|---|---|---|---|
| | HDD | Onshore Cable Route Corridor | Proposed Onshore Substation |
| 250t HDD rig | 1 | - | - |
| Power Pack | 1 | - | - |
| Control Cabin | 1* | - | - |
| Fuel Tank | 1* | 1 | - |
| Sedimentation tank | 1* | - | - |
| Fluid mix tank | 1* | - | - |
| Fluid laboratory | 1* | - | - |
| Office | 2* | - | - |
| Toilets | 1* | 1 | - |
| Meeting room | 1* | 1 | - |
| Canteen | 1* | - | - |
| Drying room | 1* | 1 | - |

| Indicative Construction plant and equipment | Indicative number required | | |
|---|---|---|---|
| | HDD | Onshore Cable Route Corridor | Proposed Onshore Substation |
| 70kva generator | 1 | 1 | - |
| 30t excavator | 4 | - | - |
| T500 TracStar | 1 | - | - |
| 20t excavator | - | 2 | - |
| D6 Bulldozer | - | 2 | - |
| 5t excavator | - | 1 | - |
| Small HDD rig (Ditch Witch for Ditches) | - | 1 | - |
| 14m Telehandler | - | 2 | - |
| Hydrema 12T back tipping dumper | - | 2 | - |
| M24 Mobile Concrete pump | - | 1 | - |
| Vibratory poker | - | 2 | - |
| Ramax Vibratory Roller | - | 2 | - |
| 10t Forward tipping dumper | - | 3 | - |
| Drum Cable Winch | - | 1 | - |
| 25t excavator with vibrating plate attachments | - | 3 | - |
| 360-degree excavators | - | - | 2 |
| Backhoe loaders | - | - | 2 |
| Dozers | - | - | 2 |
| Swivel skip dumpers | - | - | 2 |
| Mobile cranes | - | - | 2 |
| Cement mixer trucks | - | - | 2 |
| Truck mounted concrete pump | - | - | 1 |
| Piling rig | - | - | 1 |
| Generator - large | - | - | 1 |
| Generator - small | - | - | 1 |
| *Assumed to have no emissions<br>Note: Assumed Equipment as details of equipment for the Proposed Onshore Substation were not available at the time of writing the chapter | | | |

### 16.2.4 Spare Parts

21. The requirement for spare (or replacement) parts during the operation and maintenance phase is not known at this stage, therefore the likely composition of emissions in terms of the overall footprint of the Proposed Development was obtained from existing literature (Thomson & Harrison, 2015). This was assumed to be 3.7% of the total from the remaining sources during the construction and operational and maintenance phases.

### 16.2.5 Decommissioning

22. Activities associated with decommissioning of the Proposed Development were not known at the time of assessment. Therefore, emissions from the decommissioning phases were consequently derived from previous studies for offshore wind farm projects in the UK (Thomson & Harrison, 2015), which quantified them to be approximately 1.2% of the overall carbon footprint.

## 16.3 References

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