CALEDONIA
Offshore Wind Farm

**Code:** UKCAL-CWF-CON-EIA-RPT-00007-7E40

# Volume 7E Proposed Development (Onshore) Appendices

## Appendix 7-1 Geo-Environmental Preliminary Risk Assessment

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# Volume 7E Appendix 7-1 Geo-Environmental Preliminary Risk Assessment

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# Acronyms and Abbreviations

| | |
|---|---|
| **BGS** | British Geological Survey |
| **CBS** | Cement Bound Sand |
| **CEMP** | Construction Environmental Management Plan |
| **COMAH** | Control of Major Accident Hazards |
| **EIA** | Environmental Impact Assessment |
| **EIAR** | Environmental Impact Assessment Report |
| **DWPA** | Drinking Water Protected Area |
| **GDWPA** | Groundwater Drinking Water Protected Area |
| **HDD** | Horizontal Directional Drilling |
| **MTBE** | Methyl tert-butyl ether |
| **NIHHS** | Notification of Installations Handling Hazardous Substances |
| **OnTI** | Onshore Transmission Infrastructure |
| **OS** | Ordnance Survey |
| **PPE** | Personal Protective Equipment |
| **PCB's** | Polychlorinated biphenyl |
| **PAH** | Polycyclic Aromatic Hydrocarbons |
| **PFAS** | Polyfluorinated Alkyl Substances |
| **PCS** | Potentially Contaminated Sites |
| **PCSM** | Preliminary Conceptual Site Model |
| **PRA** | Preliminary Risk Assessment |
| **PWS** | Private Water Supply(ies) |

| | |
|---|---|
| **RLB** | Red Line Boundary |
| **SEPA** | Scottish Environment Protection Agency |
| **SPZ** | Source Protection Zone |
| **SuDS** | Sustainable Urban Drainage Systems |
| **TPH** | Total Petroleum Hydrocarbons |
| **UXO** | Unexploded Ordnance |
| **VOC/SVOC** | Volatile Organic Compounds / Semi Volatile Organic Compounds |

# 1 Introduction

## 1.1 Scope

1.1.1.1 This technical appendix supports Volume 5, Chapter 7: Chapter 7: Geology, Soils and Contaminated Land of the Environmental Impact Assessment Report (EIAR).

1.1.1.2 This appendix provides a Phase 1 Geo Environmental Preliminary Risk Assessment (PRA), in support of the Environmental Impact Assessment (EIA) for the Proposed Development (Onshore).

1.1.1.3 The extent of the Onshore Transmission Infrastructure (OnTI) Red Line Boundary (RLB) for the Proposed Development (Onshore) comprises the following elements:

- Landfall Site;
- Onshore Export Cable Corridor (ONEC);
- Two Onshore Substations, to be co-located within the same footprint (Onshore Substation Site); and

1.1.1.4 An Onshore Grid Connection Cable Corridor connecting the Onshore Substation to the Grid Connection Point at the existing New Deer Substation (for Phase 1). A full description of the above infrastructure is provided in Volume 1 Chapter 4: Proposed Development Description (Onshore).

## 1.2 Study Area

1.2.1.1 The study area for the PRA has been defined as the OnTI RLB, comprising the Landfall Site, the Onshore Substation Site, and the ONEC of approximately 37km and Onshore Grid Connection.

1.2.1.2 A 100m buffer is applied to the OnTI RLB in relation to identifying potential sources of contamination and potential receptors to contamination. The rationale for this buffer is based on professional judgment taking into account the author's prior understanding of contaminated land sources identified during optioneering works on the Proposed Development (Onshore), and the distance across which potential contaminated land hazards could pose unacceptable risks.

1.2.1.3 Volume 7E, Appendix 7-3: Geology, Soils and Contaminated Land Figures, Figure 7-1 presents the Geology, Soils and Contaminated Land Study Area illustrating the 10 ONEC 'Sections' and the Substation Section that have been used to subdivide the Study Area.

## 1.3 Objectives and Methodology

1.3.1.1 The PRA is a desk-based study which forms the initial step in the assessment and management of potentially contaminated land. If required, this stage then proceeds into intrusive ground investigation, laboratory analysis, detailed quantitative risk assessment, and the implementation and verification of remediation. This phased approach was described in Chapter 11 of the Onshore EIA Scoping Report (Volume 7, Appendix 1: Onshore Scoping Report).

1.3.1.2 The purpose of a PRA is to decide whether or not risks are acceptable, and if not, to determine the need for further action. In relation to the OnTI for the Proposed Development (Onshore), the following methodology has been followed:

- Identify potential sources of contamination within the study area, as far as is reasonably practicable;
- Define the potential receptors to contamination and the pathways by which they could be exposed to contamination;
- Develop a preliminary conceptual site model (PCSM) for the Proposed Development (Onshore), showing the pollutant linkages (source-pathway-receptor relationships);
- Undertake a qualitative risk assessment of the identified pollutant linkages to determine whether there are any potentially unacceptable risks;
- Identify any proposed actions to be taken to further investigate or mitigate the risks identified; and
- The findings of the PRA will inform the assessment of impacts and residual effects associated with contaminated land, within Volume 5, Chapter 7: Geology, Soils and Contaminated Land of the EIAR.

## 1.4 Legislation and Guidance

1.4.1.1 The PRA has been completed in accordance with the Environment Agency: Land Contamination Risk Management (Environment Agency, 2020[1]) and Construction Industry Research and Information Association (CIRIA) C552 Contaminated Land Risk Assessment (CIRIA, 2001[2]).

## 1.5 Sources of Information

1.5.1.1 The following desk-based sources of information have been obtained and reviewed to identify potential sources of contamination, potential receptors, and other baseline condition information applicable to the PRA for the Proposed Development (Onshore):

- Aberdeenshire Council:

  - Database of Potentially Contaminated Sites (PCS);
  - Cemeteries and Burial Grounds; and
  - Private Water Supplies (PWS).
- Ordnance Survey (OS) Master Mapping: detailed 1:1,250 ordnance survey digital mapping, including the locations of minor watercourses.
- Landmark Information Group:
  - Historic land use data (Contaminated Land and Industrial Land Uses);
  - British Geological Survey (BGS) recorded landfill sites,
  - Scottish Environment Protection Agency (SEPA) registered landfill sites;
  - BGS recorded mineral sites;
  - BGS recorded radon gas potential; and
  - BGS artificial ground (infilled ground, made ground, worked ground).
- Scottish Environment Protection Agency (SEPA)
  - Drinking water protected areas (DWPA);
  - Waterbody classifications; and
  - Groundwater classification (bedrock).
- NatureScot: Peat and carbon-rich soils (NatureScot, 2016[3]).
- Zetica: Online Unexploded Ordnance (UXO) risk mapping.

1.5.1.2 The Aberdeenshire Council PCS database has been built by the council and derived from available historic mapping, records of current and predecessor councils (e.g. waste management and petroleum licenses), aerial photography, roadside photography, site visits, complaints of pollution incidents, and findings of site investigations carried out under planning.

1.5.1.3 The PCS overlay and associated data is used to carry out council duties under Part IIA of the Environmental Protection Act 1990 (Scottish Executive, 2006[4]) to assess planning applications in respect of contaminated land and provide replies to environmental information requests.

1.5.1.4 The following datasets were requested from Landmark Information Group; however Landmark have advised that the datasets were searched and that no features were recorded within the study area, either due to lack of features or the dataset not being applicable to the study area:

- Control of Major Accident Hazards (COMAH) Sites;
- Explosive Sites;
- Notification of Installations Handling Hazardous Substances (NIHHS);

- Planning Hazardous Substance Consents;
- Contaminated Land Register Entries and Notices; and
- Fuel Stations.

## 1.6 Limitations

1.6.1.1 Identification and assessment of geotechnical risks and geohazards are not within the remit of this Phase 1 Geo Environmental PRA, except where the risks or hazards relate to potential contamination. For example, a landfill site is both a potential source of contamination and a potential area of poor/soft/collapsible ground, however only the contaminative potential of the site is relevant to this study.

1.6.1.2 Assessment and management of geotechnical risks falls within the remit of engineering design and is not covered by this PRA or Volume 5, Chapter 7: Geology, Soils and Contaminated Land of the EIAR. The concept design of the OnTI has been undertaken by an external consultant appointed by Caledonia Offshore Wind Farm Limited (the Applicant).

1.6.1.3 As described in Section 1.3, the PRA is the first stage of a phased approach to the management of contaminated land risks of the Proposed Development (Onshore). Future phases such as ground investigation, laboratory analysis, and detailed quantitative risk assessment will be undertaken in the future to characterise in the nature of contamination at the site and contaminative potential of the Proposed Development (Onshore), and to manage these risks. These steps are regarded as Embedded Mitigation, as described in Section 7.5.6 of Volume 5, Chapter 7: Geology, Soils and Contaminated Land of the EIAR.

# 2 Study Area and Land Use

## 2.1 Current Land Use

2.1.1.1 The study area is located between the Landfall Site to the west of the village of Whitehills and extends south-eastwards to the Onshore Substation Site in proximity to the existing New Deer substation south-east of Turriff and near the village of Greens.

2.1.1.2 The study area is predominantly rural, including both arable and grazed farmland. Locally areas of woodland are present. There are also several wind turbines within the study area.

2.1.1.3 Villages, hamlets, farms and isolated properties have been excluded from the OnTI RLB, except for Burnside Farm which is within the OnTI RLB at the Onshore Substation Site.

2.1.1.4 Throughout the study area there are several farms and residential properties located within 100m of the OnTI RLB and would therefore potentially be within 100m of the construction works.

## 2.2 Historic Land Use

2.2.1.1 The study area has comprised rural agricultural land for the majority of its history and has remained largely undeveloped, with the exception of localised light industrial, transport, quarrying and landfilling activities.

2.2.1.2 Potentially contaminative historic activities and land-uses are identified within the Landmark Historic Land Use Data, which is produced from the 1:10,000 and 1:10,560 scale historic OS mapping held by Landmark. Potentially contaminative activities and land-uses identified by these datasets are summarised in Table 2-1. Where appropriate, focused internet research has also been undertaken and Historic Ordnance Survey mapping at 1:10,560 and 1:10,000 scales have been reviewed to provide additional detail on the study area history.

Table 2-1: Key potentially contaminative historic land uses

| Potentially contaminative historic land use | Map dates (if stated) | Location (from OnTI RLB) |
|---|---|---|
| **Landfall Site to B9139** | | |
| Agricultural land | 1866 to present | Within OnTI RLB |
| Quarry / Pit ("Old Quarry") | 1902 | 100m west |

| Potentially contaminative historic land use | Map dates (if stated) | Location (from OnTI RLB) |
|---|---|---|
| Farm buildings "Upper Dallachy" | 1888 to present | 75m south |
| **ONEC: Section 1 – B9139 to A98** | | |
| Quarry / Pit / Infilled Ground | 1967 | Within OnTI RLB |
| Agricultural land | 1866 to present | Within OnTI RLB |
| RAF Banff airfield located to the west of site. 100m assessment buffer on red-line boundary encroaches into former RAF site | 1943 to 1982 | 80m west |
| **ONEC: Section 2 - A98 to A97** | | |
| Railway | 1963 | Within OnTI RLB |
| Quarry / Pit / Infilled Ground | 1977 | Within OnTI RLB |
| Quarry / Pit / Infilled Ground (ceased) | - | 80m west |
| Agricultural land | 1866 to present | Within OnTI RLB |
| Unspecified tanks | 1967 | 62m east |
| **ONEC: Section 3 - A97 to B9121** | | |
| Quarry / Pit / Infilled Ground (ceased) | - | Within OnTI RLB |
| Tanks boundary encroaches into 100m assessment buffer | 1966 | 100m west |
| Agricultural land | 1866 to present | Within OnTI RLB |
| **ONEC: Section 4 - B9121 to River Deveron** | | |
| Agricultural land | 1866 to present | Within OnTI RLB |

| Potentially contaminative historic land use | Map dates (if stated) | Location (from OnTI RLB) |
|---|---|---|
| Quarry / Pit / Infilled Ground (ceased) | - | Within OnTI RLB |
| Farm buildings | 1966 to present | 85m north-east |
| **ONEC: Section 5 - River Deveron to Castleton** | | |
| Quarry / Pit / Infilled Ground (ceased) | - | Within OnTI RLB |
| Quarry / Pit / Infilled Ground (ceased) | - | 30m north |
| Agricultural land | 1866 to present | Within OnTI RLB |
| Farm buildings "South Holymill" | 1966 to present | 56m east |
| **ONEC: Section 6 - Castleton to A947** | | |
| Agricultural land | 1866 to present | Within OnTI RLB |
| Dismantled railway | 1964 | Within OnTI RLB |
| Potential tanks | 1967 | 74m north |
| Vehicle / maintenance garage | 1989 - present | 63m east |
| **ONEC: Section 7 - A947 to B9105** | | |
| Agricultural land | 1866 to present | Within OnTI RLB |
| **ONEC Section 8: B9105 to B9170** | | |
| Sheep Wash | 1967 | 100m south |
| Fintry Smithy | 1967 | 60m north |
| Agricultural land | 1866 to present | Within OnTI RLB |
| **ONEC Section 9: B9170 to Ewebrae Farm** | | |
| Sheep Wash | 1968 - present | 78m north |

| Potentially contaminative historic land use | Map dates (if stated) | Location (from OnTI RLB) |
|---|---|---|
| Agricultural Land | 1866 to present | Within OnTI RLB |
| **ONEC Section 10: Ewebrae Farm to Onshore Substation Site** | | |
| Agricultural land | 1866 to present | Within OnTI RLB |
| Quarry / Pit / Infilled Ground | 1970 | 32m south |
| Opencast quarry (ceased) | - | 69m south |
| **Onshore Substation Site** | | |
| Agricultural land | 1866 to present | Within OnTI RLB |
| Electrical Substation (New Deer) | Present | Within OnTI RLB |

2.2.1.3 Areas of potential historic contaminative land use are shown on Figure 7-5 within Volume 7E, Appendix 7-3: Geology, Soils and Contaminated Land Figures.

## 2.3 Geological Setting

### 2.3.1 Superficial Geology (Drift)

2.3.1.1 Information on superficial geology of the OnTI RLB has been obtained from BGS digital mapping datasets at 1:50,00 scale.

2.3.1.2 The study area comprises a lowland glaciated and periglaciated terrain, with associated landforms and superficial deposits such as till, glaciofluvial and glaciolacustrine deposits.

2.3.1.3 Younger post-glacial superficial deposits such as peat, head, alluvium, raised marine and river terrace deposits are also present, associated with watercourses, wetlands and slope processes.

2.3.1.4 Areas of potentially shallow bedrock are also present locally, where soil cover is likely to be <1m thick.

2.3.1.5 A map of superficial geology is shown within Figure 7-2 in Volume 7E, Appendix 7-3: Geology, Soils and Contaminated Land Figures.

### 2.3.2 Bedrock Geology (Solid)

2.3.2.1 Information on bedrock geology within the OnTI RLB has been obtained from BGS digital mapping datasets at 1:50,000 scale.

2.3.2.2 Bedrock geology is shown on Figure 7-3 within Volume 7E, Appendix 7-3: Geology, Soils and Contaminated Land Figures.

2.3.2.3 Bedrock geology at the Landfall Site comprises psammite and pelite of the Whitehills Grit Formation, with localised areas of metacalcareous rock, metamicrogabbro and amphibolite, gritty psammite, and semipelite.

2.3.2.4 Bedrock geology at the Onshore Substation Site comprises micaceous psammite, semipelite and pelite of the Macduff Formation, with a small area of quartz-microgabbro in the far south of the Onshore Substation Site.

2.3.2.5 Bedrock geology within the ONEC is variable. The majority of the ONEC comprises micaceous psammite, psammite, semipelite and pelite of the Macduff Formation and Whitehills Grit Formation. Approximately 10km within the study area in the south comprises sedimentary rocks (conglomerate, sandstone, siltstone and mudstone) of the Crovie and Inverness Sandstone Groups.

### 2.3.3 Borehole Records

2.3.3.1 A summary of BGS borehole records within the OnTI RLB and within an 100m buffer are summarised in Table 2-2.

2.3.3.2 The BGS records show a ground investigation including 43 boreholes within the area of the Landfall Site only. All other investigations lie outside the study area. All 43 boreholes are within a close proximity of each other therefore a summary of two of the boreholes, one north and one south have been provided as a general overview of the ground conditions at the Landfall.

2.3.3.3 It is noted that the ground conditions encountered in these boreholes at the landfall will not be representative of the ground conditions across the study area as a whole. Significant variations may exist in lithology and stratigraphy across the study area.

Table 2-2: Summary of BGS Borehole Records

| Borehole ID | Location | Date | Depth (m) | Description |
|---|---|---|---|---|
| **Landfall site** | | | | |
| BGS ID:642813 | Within OnTI RLB | 1970 | 0-1.70 | Medium dense brown fine SAND |
| | | | 1.70 - 5.30 | Firm to stiff dark grey very sandy silty CLAY with gravel |
| | | | 5.30 - 10.50 | Very stiff to hard dark grey-brown and dark grey sandy silty CLAY with gravel and occasional cobbles |
| | | | 0.50 - 11.60 | Firm grey sandy silty GLAY with gravel |
| | | | 11.60 - 15.25 | Faintly weathered dark grey fine to coarse QUARTZITE |
| | | | 15.25 - 16.25 | Moderately weathered dark green weak PHYLLITE intensely and randomly fractured |
| | | | 16.25 - 17.05 | Moderately weathered light grey medium calcareous QUARTZITE |
| | | | 17.05 - 21.60 | Fresh dark grey medium strong QUARTZITE |
| BGS ID:642799 | Within OnTI RLB | 1970 | 0.00 - 0.30 | Topsoil |
| | | | 0.30 - 1.23 | Light brown silty medium to coarse SAND with occasional rootlets |
| | | | 1.23 - 1.84 | Brown Clayey silty medium SAND with occasional gravel and cobbles |
| | | | 1.84 - 14.50 | Firm to stiff grey-brown sandy silty CLAY with fine to coarse gravel and cobbles |

| Borehole ID | Location | Date | Depth (m) | Description |
|---|---|---|---|---|
| | | | 14.50 - 22.50 | Medium dense becoming dense light brown silty fine to medium SAND |
| | | | 22.50 - 25.00 | Firm grey-brown sandy silty CLAY with occasional fine to medium gravel |
| | | | 25.00 - 27.25 | Highly weathered light grey coarse QUARTZITE intensely fractured to coarse gravel and cobble sized fragments |
| | | | 27.25 - 32.35 | Faintly weathered dark grey QUARTZITE |
| | | | 32.35 - 33.95 | Highly weathered light grey fine to medium friable and weak muddy limestone with bands of dark grey QUARTZITE |
| | | | 33.95 - 36.35 | Faintly weathered grey fine QUARTZITE |

## 2.4 Carbon Rich Soils and Peatland

2.4.1.1 Information on carbon-rich soils and peatland has been obtained from NatureScot (NatureScot, 2016[3]) and subsequently the peat depth and peatland habitat surveys completed in 2023 and 2024 (Volume 7E, Appendix 7-2: Peat Survey Reports). There are localised areas of Class 1, Class 3, Class 4 and Class 5 soils mapped throughout the study area, including areas of Class 1 to 5 peatland which are directly within the OnTI RLB. However, peat survey has confirmed that there is no Class 1 peatland within the OnTI RLB.

2.4.1.2 Areas of peatland / peat soils and potential impacts are described in Volume 5, Chapter 7: Geology, Soils and Contaminated Land. An Outline Peat Management Plan is submitted alongside this PPP application (Application Document 7) which sets out how disruption and impacts to peatland will be minimised and the principles to be considered for managing the re-use and storage of excavated peat.

## 2.5 Mineral Extraction

2.5.1.1 There are no active quarries or extractive sites within the study area.

2.5.1.2 Information on historic mineral extraction has been obtained from the BGS Recorded Mineral Sites Database. A summary of BGS recorded mineral sites within 100m of the OnTI RLB are identified in Table 2-3.

Table 2-3: BGS Recorded Mineral Sites

| Name | Status | Location |
|---|---|---|
| Upper Dallachy (Igneous and Metamorphic Rock) | Opencast - ceased operation | Landfall Site to B9139 (363264E, 864974N m) |
| Rettie (Igneous and Metamorphic Rock) | Opencast - ceased operation | ONEC: Section 1 – B9139 to A98 (363567E, 863287N m) |
| Little Blairshinnoch (Igneous and Metamorphic Rock) | Opencast - ceased operation | ONEC: Section 2 - A98 to A97 (363705E, 861404N m |
| South Itlaw (Igneous and Metamorphic Rock) | Opencast - ceased operation | ONEC: Section 3 - A97 to B9121 (366802E, 858233N m) |
| Waulkmill Gravel Pit | Opencast - ceased operation | ONEC: Section 4 - B9121 to River Deveron (368500E, 858108N m) |
| Scattertie Gravel Pit | Opencast - ceased operation | ONEC: Section 5 - River Deveron to Castleton (370240E, 857281N m) |
| Scattertie (Igneous and Metamorphic Rock) | Opencast - ceased operation | ONEC: Section 5 - River Deveron to Castleton (370251E, 857330N m) |
| Bridge Of Swanford (Igneous and Metamorphic Rock) | Opencast - ceased operation | Onshore Corridor Section 10: Ewebrae Farm to Onshore Substation Site (382339E 845390N m) |

## 2.6 Radon Gas

2.6.1.1 The presence of radon gas is assessed in the United Kingdom (UK) according to the number of homes likely to be above the Action Level (200 becquerels per cubic metre (Bq m-3)). Under the building regulations the requirement for protection measures (described in Building Research Establishment, 2015)[5] in the construction of new buildings, conversions or extensions is dependent on Radon potential.

2.6.1.2 The BGS provide an indication of radon potential within the study area. Radon potential is measured on a percentage scale from 0% to 100%.

2.6.1.3 There is a combination of Class 1 to Class 4 radon potential within the ONEC sections (Landfall Site to ONEC Section 10). Most of the ONEC

section lies in the lowest band of radon potential. Less than 1 % of homes within this area would be above the Action Level, however some areas include bands of elevated radon potential. Maximum radon potential within the area is 5-10 %

2.6.1.4 The Onshore Substation Site lies within a combination of Class 1 and Class 2 radon potential. The majority of the Onshore Substation Site lies within a less than 1% while the north-western border lies within a maximum radon potential of 1-3 %.

## 2.7 Potentially Contaminated Sites

2.7.1.1 A database of potentially contaminated sites within the Scoping Area at the EIA Scoping stage was shared by Aberdeenshire Council. Potentially contaminated sites identified by Aberdeenshire Council and located within the study area are summarised in Table 2-4.

Table 2-4: Recorded potential contaminated land locations

| Potentially Contaminated Site |
|---|
| Stakeness Mill Dam - E1 Ba<br>Location: Within the OnTI RLB, at the Landfall Site<br>(364294E, 865444N m) |
| QUARRY 1 3686 E2<br>Location: 100m north-west of Landfall Site<br>(363262E, 864975N m) |
| Tillynaught to Banff railway line<br>Location: Within the OnTI RLB, ONEC section 2<br>(363768E, 862754N m) |
| QUARRY 13 3686 E2<br>Location: 70m west of ONEC section 2<br>(363691E, 861405N m) |
| Hilton Mill Dam<br>Location: 40m north of ONEC section 2<br>(364220E, 861036N m) |
| Todholes Quarry - E1 Ba<br>Location: Within the OnTI RLB, ONEC section 2<br>(365090E, 860476N m) |
| Upper and lower Mallyrust Mill Dam and Lead - E1 Ba<br>Location: Within the OnTI RLB at ONEC section 2 |

| Potentially Contaminated Site |
| --- |
| (365841E, 859787N m) |
| QUARRY 11 3685 E2<br>Location: Within the OnTI RLB, at ONEC: section 3<br>(366816E 858222N m)<br>Mill of Ryland Quarry - E1 Ba<br>Location: 50m north of ONEC: section 3<br>(366907E, 858521N m) |
| Greenlaw Quarry - E1 Ba<br>Location: 90m north of ONEC: section 3<br>(367590E, 858296N m) |
| GRAVEL PIT 2 3685 E2<br>Location: Within the OnTI RLB at ONEC: section 4<br>(368520E 858097N m)<br>Waulkmill Crofts Mill Dam - E1 Ba<br>Location: 45m north of ONEC: section 4<br>(368602E, 858223N m) |
| Hungryhill Mill Dam and Lead - E1 Ba<br>(368804E, 857767N m)<br>Location: Within the OnTI RLB, at ONEC: section 4 |
| Mill Dam 1 - 3685 E1 Ab<br>(369569E 857148N m)<br>Location: Within the OnTI RLB, at ONEC: section 5 |
| QUARRY 1 3785 E2<br>Location: Within the OnTI RLB, at ONEC: section 5<br>(370245E 857289N m) |
| Railway Turriff to Banff 3785<br>Location: Within the OnTI RLB, at ONEC: section 6<br>(372870E 854684N m)<br>Plaidy Station<br>Location: 10m north of ONEC: section 6<br>(372893E 854877N m)<br>Lower Plaidy Mill Dam - E1 Ab<br>Location: 90m north of ONEC: section 6<br>(372981E 854,831N m) |
| Fintray Smithy |

| Potentially Contaminated Site |
|---|
| Location: 40m north ONEC: section 8<br>(375338E 853837N m) |
| Haremoss Sheep Dip<br>Location: 65m north-east of ONEC: section 9<br>(378074E 849647N m) |
| Parkhill Stores[i]<br>Location: <5m north of the Onshore Substation Site<br>(382688E 845627N m)<br>Greens Bar<br>Location: <5m north of Onshore Substation Site area<br>(382936E 845658N m) |

2.7.1.2 As part of EIA consultation with SEPA, the presence of the former Banff Airfield at NJ6190064300 was highlighted. SEPA stated that traces of Radium-226 may be present in the vicinity due to its former use and requested that, if any excavation is to take place within 1 km of the centre of this site, a Phase 1 desktop study for land contamination should be submitted with any future planning application in which the likelihood of radioactive contamination should be assessed and whether any further detailed assessment is required. Ideally this desktop study should be accompanied by a walk over survey by an experienced practitioner.

2.7.1.3 Banff Airfield does not lie within the study area set for this PRA, however, given the request made by SEPA, the distance of the centre of the site to the study area has been checked. The centre of the RAF Banff site was determined at Grid Reference NJ62116 63933 using the boundary of the airfield site provided by Aberdeenshire Council (see Section 1.5). The centre of the site is 1.1km away from any areas of potential excavation associated with the Proposed Development (Onshore). A cross check of the distance when the centre of the site is taken as the centre of the triangular area between the three runways confirms that it is also greater than 1km from the Proposed Development (Onshore). As no excavation is to take place within 1km of the centre of the airfield, no further assessment of radioactive contamination is presented in this PRA.

2.7.1.4 The potentially contaminated sites identified by Aberdeenshire Council are shown on Figure 7-5 in Volume 7E, Appendix 7-3: Geology, Soils and Contaminated Land Figures.

[i] Both "Parkhill Stores" and "Greens bar", are identified as structures in historic mapping. From 1882 to 1914, Parkhill Stores includes two pumps and Greens bar is a Post Office. No further information is available to provide details on the nature of potentially contaminative activities at these sites.

## 2.8 Manufacturing and Production Activities

2.8.1.1 A database of potentially contaminative industrial activities currently or recently taking place within the Scoping Area was obtained from Landmark Information Group (Landmark).

2.8.1.2 The following potentially contaminative activities and features are identified by Landmark within the study area. There are no recorded contaminative activities inside the OnTI RLB with the sites listed below within the 100m buffer zone:

- Landfall Site to B9139
  - Tank - 78m south (363959E, 865178N m).
  - Dallachy Farm arable farming - 87m south (364117E, 865153N m).
- ONEC section 2 - A98 to A97
  - Farming industry - Hoppers and Silos - 84m east (366211E, 859,633N m).
  - A L Thompson arable farming - 91m east (366197E, 859609N m).
- ONEC section 3 - A97 to B9121
  - Water Pump - 17m north (366624E, 858455N m).
- ONEC section 6 - Castleton to A947
  - CJ Gray Livestock Farming - 74m west (372653E, 854626N m).
- ONEC section 7 - A947 to B9105
  - Energy Production wind turbine - on site (374006E, 853842N).
- ONEC section 8 - B9105 to B9170
  - W H Slating Services- 44m south-west (377331E, 850282N m).
  - Charles Stephen & Son Mixed Farming - 70m south-west (378623E, 848193N m).
  - Water Pump - 36m east (378750E, 847341N m).
  - Energy Production wind turbine - 23m east (378855E, 847154N m).
- ONEC section 9 - B9170 to Ewebrae Farm
  - D N C Sivewright Mixed or Unspecified Farming - 72m east (378114E, 846413N m).
- ONEC section 10 - Ewebrae Farm to Onshore Substation Site
  - Energy Production Ewebrae Turbine - 10m east (378403E, 846412N m).
- Onshore Substation Site
  - Water Pump - 82m south-west (379772E, 844958N m).

- Water Pump - 30m south (382837E, 844990N m).

2.8.1.3 Additional potentially contaminative activities are shown on the OS MasterMap data within the study area. A summary is presented below:

- ONEC section 4 - B9121 to River Deveron
  - Tank - 85m north (369545E, 857539N)
- ONEC section 10 - Ewebrae Farm to the Onshore Substation Site
  - Onshore Substation Site adjacent to Ewebrae wind turbine
  - Tank - 95m north-west (382317E, 845318N m)

## 2.9 Hydrology and Hydrogeology

### 2.9.1 Surface Water

2.9.1.1 There are 26 named watercourses located in the study area, these are listed within Volume 5, Chapter 6: Hydrology and Hydrogeology, Section 6.4.

2.9.1.2 Five main rivers are to be crossed by the ONEC, identified in the SEPA river body classification database. These rivers are managed under the Water Framework Directive (WFD) (WFD, 2000[6]):

- Boyndie Burn - ONEC section 2;
- Burn of Brydock - ONEC section 3;
- River Deveron - boundary of ONEC section 4 and section 5;
- Burn of Turriff / Idoch Water - ONEC section 8; and
- Burn of Turriff / Idoch Water - ONEC section 9.

2.9.1.3 Another section of the Burn of Turriff / Idoch Water is also located within the study area but does not encroach into the OnTI RLB and is therefore not be crossed by the ONEC.

### 2.9.2 Drinking Water Protected Areas

2.9.2.1 The study area contains a DWPA (Surface Water) associated with the River Deveron (Turriff to tidal limit) and Idoch Water waterbodies.

2.9.2.2 The entirety of the study area is also within a Groundwater Drinking Water Protected Area (GDWPA).

### 2.9.3 Aquifer Classification

2.9.3.1 Aquifer classification data is provided by SEPA. The data shows the potential productivity of bedrock aquifers and describes the nature of groundwater flow within the rocks (SEPA, 2022[7]).

2.9.3.2 The majority of the OnTI RLB lies within an area of Class 2C aquifer productivity. This forms part of the Southern highland group of rocks, which is considered a low productivity aquifer. Flow in this aquifer is typically through fractures and discontinuities where small amounts of groundwater in near surface weathered zone and secondary fractures are typically present.

2.9.3.3 ONEC sections 7, 8 and 9 lie within an area of Class 2B aquifer productivity. This is part of the undifferentiated middle old red sandstone group which is a moderately productive aquifer where flow is via fractures or discontinuities. These aquifers provide local yields and small amounts of groundwater.

2.9.3.4 No information pertaining to superficial aquifers was available at the time of writing. It can be assumed however that granular material within proximity to a watercourse/waterbody within the study area may be water bearing.

### 2.9.4 Private Water Supplies

2.9.4.1 PWS have been identified from data shared by Aberdeenshire Council within the OnTI RLB and 100m buffer zone.

2.9.4.2 PWS can originate from a number of sources including surface water bodies or boreholes and must be registered with the local authority.

2.9.4.3 Only one PWS lies within the OnTI RLB boundary.

2.9.4.4 The source and approximate distance of PWS to the OnTI RLB are summarised in Volume 7E, Appendix 6-3: Private Water Supply Assessment. The locations of the PWS are displayed in Volume 7E, Appendix 6-3: Private Water Supply Figures (Confidential).

2.9.4.5 It is noted that the locations of PWS shown by the database record the location at which the abstraction license is registered, and not necessarily the location of the abstraction itself.

2.9.4.6 Further information on the nature and locations of PWS will be obtained at a later date as the design of the Proposed Development (Onshore) progresses, to inform detailed design and mitigation measures.

### 2.9.5 Wells and Pumps

2.9.5.1 The OS MasterMap data indicates that there are fifteen wells within the study area, of which six are within the OnTI RLB.

2.9.5.2 The Landmark data indicates there are nine pumps and one water pumping station within the study area.

2.9.5.3 Two pumps are located adjacent to each other within the OnTI RLB within Section 10 - Ewebrae Farm to Substation. Both pumps are noted as industrial features used for manufacturing and production.

### 2.9.6 Unexploded Ordnance (UXO)

2.9.6.1 The Zetica online UXO mapping[8] has been consulted, which provide a high-level assessment of WWII bombing densities. The map shows that the study area lies within a low risk area for UXO.

2.9.6.2 Outside the study area, there is a record of a UXO find in fields to the east of Whyntie Wood. There is also a former military airfield, RAF Banff, recorded to the west of the study area, which may have been a strategic bombing target during WWII.

2.9.6.3 No further information on UXO risk has been obtained as part of this PRA. It is recommended that a UXO Desk Study assessment is carried out by a specialist UXO contractor for Section 1 of the ONEC, to assess the potential UXO risk posed during excavation.

# 3 Preliminary Conceptual Site Model

3.1.1.1 A Conceptual Site Model (CSM) describes the scenarios in which the risks to human health and the environment from contaminated land are assessed. It describes the ground conditions and potential existing contamination, and the activities to be performed during construction, operation and decommissioning. It also identifies and characterises potential human and ecological receptors, and plausible pathways by which receptors could come into contact with contamination.

3.1.1.2 The assessment of the impacts arising from potentially contaminated land is based upon consideration of pollution linkages between contamination sources and sensitive receptors. All three elements of a source-pathway-receptor model must be present for a site or area of a site to be determined contaminated, and for there to be a viable risk associated with contamination.

3.1.1.3 This section presents the preliminary CSM for the Proposed Development (Onshore), based on the OnTI setting and the reviewed environmental information.

## 3.2 Potential Sources of Contamination

3.2.1.1 A review of the historic and current land-uses and activities across the OnTI RLB indicates several potential sources of contamination to exist within the OnTI RLB, and within the 100m buffer ("off site"), as summarised in Table 3-1.

3.2.1.2 The list of potential contaminants associated with the land-uses and activities identified from the desk-based review are derived from the CL:AIRE Industry Profiles (CL:AIRE, 1995[9]). The Department of Environment (DoE) Industry Profiles (published in 1995) provide information on the processes, materials and waste associated with individual industries with regard to land contamination. These have been used where applicable on identifying potential contaminants of concern in relation to the Landfall Site, ONEC, and Onshore Substation Site locations.

Table 3-1: Potential contaminated land uses

| Location | Potential source of contamination | Potential contaminants or contaminative materials |
|---|---|---|
| Landfall Site to B9139 | Within OnTI RLB: Agricultural land use and arable farming. Potential for made ground within Mill Dam. Existing infrastructure such as roads and utilities. | Herbicides, pesticides, heavy metals, ash, Polycyclic Aromatic Hydrocarbons (PAH), sulphates, metal fines, asbestos, total petroleum hydrocarbons (TPH), volatile and semi-volatile organic compounds (VOC and SVOC's) and solvents. |

| Location | Potential source of contamination | Potential contaminants or contaminative materials |
|---|---|---|
| | Off Site: Quarrying and pitting (including potentially infilled / made ground), tanks. | (In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds)<br>(In addition, for fuel tanks; PAH, fuel oils, Methyl tert-butyl ether (MTBE)). |
| ONEC: section 1 – B9139 to A98 | Within the OnTI RLB: Agricultural land use and arable farming, quarrying and pitting. Existing infrastructure such as roads and utilities.<br>Off Site: Quarry (including potentially infilled / made ground), former WW2 RAF airfield, hoppers and silos. | Herbicides, PAH, sulphates, metal fines, asbestos, TPH, VOC and SVOC's and solvents.<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds)<br>(in addition to the above for the airfield; fuel oil, de-icing agents, firefighting chemicals Polyfluorinated Alkyl Substances (PFAS), acids alkalis inorganic compounds, UXO).<br>(in addition for hoppers and silos; it depends on contents but may include methane, carbon dioxide, hydrogen sulphide, micro-organisms (pathogens), organic compounds). |
| ONEC: section 2 - A98 to A97 | Within the OnTI RLB: Agricultural land use, quarrying and pitting, Tillynaught to Banff railway line. Existing infrastructure such as roads and utilities.<br>Off Site: Quarry (including potentially infilled / made ground), unspecified tanks, mill dam and leads. | Herbicides, PAH, sulphates, metal fines, asbestos, TPH, VOC and SVOC's and solvents.<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds)<br>(In addition for railway; fuel oils, Polychlorinated biphenyl (PCB's), metal fines, ferrous residues, PAH, lubricating oil, ethylene glycol, creosote).<br>(In addition for tanks; PAH, fuel oils, MTBE) |
| ONEC: section 3 - A97 to B9121 | Within the OnTI RLB: Agricultural land use, quarrying and pitting. Existing infrastructure such as roads and utilities.<br>Off Site: Unspecified tank, water pumpstation. | Herbicides, PAH, sulphates, metal fines, asbestos, TPH, VOC and SVOC's and solvents.<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds)<br>(In addition for unspecified tanks; PAH, fuel oils, MTBE). |

| Location | Potential source of contamination | Potential contaminants or contaminative materials |
|---|---|---|
| ONEC: section 4 - B9121 to River Deveron | Within the OnTI RLB: Agricultural land use, quarrying and pitting, mill dam. Existing infrastructure such as roads and utilities.<br>Off Site: Mill dam and leads. | Herbicides, PAH, sulphates, metal fines, asbestos, TPH, VOC and SVOC's and solvents.<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds) |
| ONEC: section 5 - River Deveron to Castleton | Within the OnTI RLB: Agricultural land use, quarrying and pitting, mill dam. Existing infrastructure such as roads and utilities.<br>Off Site: Quarrying and pitting (including potentially infilled / made ground), mill dam. | Herbicides, pesticides, PAH, sulphates, metal fines, asbestos, TPH, VOC and SVOC's and solvents.<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds) |
| ONEC: section 6 - Castleton to A947 | Within the OnTI RLB: Agricultural land use and livestock farming, dismantled railway including station. Existing infrastructure such as roads and utilities.<br>Off Site: Quarrying and pitting (including potentially infilled / made ground), vehicle garage, unspecified tanks, mill dam. | Herbicides, PAH, sulphates, metal fines, asbestos, TPH, VOC and SVOC's and solvents.<br>(In addition for railway; fuel oils, PCB's, metal fines, ferrous residues, PAH, lubricating oil, ethylene glycol, creosote).<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds)<br>(In addition for unspecified tanks and vehicle garages; PAH, fuel oils, MTBE). |
| ONEC: section 7 - A947 to B9105 | Within the OnTI RLB: Agricultural land use. Existing infrastructure such as roads and utilities.<br>Off Site: Wind turbine. | Herbicides, pesticides, TPH, heavy metals, fuel oils.<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds) |
| ONEC: section 8 - B9105 to B9170 | Within the OnTI RLB: Agricultural land use and mixed/unspecified farming. Existing infrastructure such as roads and utilities.<br>Off Site: Sheep wash, smithy, slating services, water pump, wind turbine. | Herbicides, pesticides, PCB's, heavy metals, fuel oils, TPH, VOC and SVOC's and solvents.<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds) |
| ONEC: section 9 - B9170 to Ewebrae Farm | Within the OnTI RLB: Agricultural land use. Existing | Herbicides, pesticides.<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, |

| Location | Potential source of contamination | Potential contaminants or contaminative materials |
|---|---|---|
| | infrastructure such as roads and utilities.<br>Off Site: Sheep wash. | solvents, chlorinated solvents and inorganic compounds) |
| ONEC: section 10 - Ewebrae Farm to Onshore Substation Site | Within the OnTI RLB: Agricultural land use. Existing infrastructure such as roads and utilities.<br>Off Site: Quarrying and pitting. Wind turbine and substation. | Herbicides, pesticides, heavy metals, ash (PAH), sulphates, metal fines, asbestos, TPH, volatile and VOC and SVOC's and solvents.<br>(in addition for substation; PCB's and mineral oils).<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds) |
| Onshore Substation Site | Within the OnTI RLB: Agricultural land use. Existing infrastructure such as roads and utilities.<br>Off Site: Parkhill Store and Greens Bar (made ground). Existing New Deer substation. | Herbicides, PAH, sulphates, metal fines, asbestos, TPH, VOC and SVOC's and solvents.<br>(it is unknown the use of Parkhill Stores and Greens Bar, both structures may contain asbestos and potential contaminants of concern listed above).<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds)<br>(in addition for substation; PCB's and mineral oils). |

## 3.3 Potential Contamination Pathways

3.3.1.1 The following section discusses potential pathways for exposure to ground and groundwater contamination.

### 3.3.2 Construction Phase

#### Dermal contact, ingestion and inhalation of soil, dust, or groundwater

3.3.2.1 During construction, site workers who are engaged in breaking of hardstanding, ground works and handling of excavated soils may come into contact with contaminated material.

3.3.2.2 Dust generated through excavation and stockpiling of excavated material may impact site neighbours and land users outside the OnTI RLB.

## Leachate generation and migration

3.3.2.3 There is potential for the generation and migration of leachate from any soils through which infiltration of surface water or groundwater may occur. It is expected that this will occur within the shallow subsurface above the bedrock strata.

3.3.2.4 The ONEC and Onshore Substation Site are typically underlain by Till. Depending on its permeability, in some situations Till can reduce the likelihood of vertical leachate migration into the underlying bedrock where present.

3.3.2.5 In areas of granular material including alluvium, river terrace deposits, and granular glacial deposits, the likely high permeability of these materials may increase the likelihood of leachate migration into the underlying bedrock.

## Lateral and vertical migration of contaminants

3.3.2.6 Contaminants released to the ground through spillage or leaks may migrate vertically or laterally through the underlying strata or within existing or proposed service trenches.

3.3.2.7 Superficial deposits of low permeability can act as a pathway for contaminant migration. Additionally, shallow rock is anticipated locally throughout the ONEC, Landfall Site, and Onshore Substation Site, and in these locations, contamination could potentially be released directly into bedrock aquifers.

3.3.2.8 Vertical migration of contaminants may also occur as a result of the construction of deep foundations, which can transfer shallow contamination to deeper strata, however it is anticipated that pad/raft foundations are used at the Onshore Substation Site.

3.3.2.9 Additionally, the construction of trenchless installations such as Horizontal Directional Drilling (HDD) at the Landfall Site and within the ONEC may result in the introduction of contaminants (such as drilling fluids) into deeper strata.

## Ground gas migration

3.3.2.10 No historic mining activity has been identified within the ONEC or Onshore Substation Site.

3.3.2.11 Peat is present locally within the ONEC. Other deposits which could potentially contain organic material and lenses of peat, for example alluvium, are also present within the study area, including alluvium within the Onshore Substation Site. Peat and organic soils can be a source of ground gases including methane, which could migrate into enclosed spaces or buildings during construction.

3.3.2.12 Made ground is anticipated locally within various parts of the OnTI RLB, associated with historic activities. Made ground can be a source of various ground gases, depending on the nature and origin of the material.

3.3.2.13 Radon gas has been identified as having a maximum potential up to 10% in some areas of the study area and 1-3 % at the Onshore Substation Site.

3.3.2.14 The construction of the OnTI will require temporary buildings within site compounds, and enclosed spaces such as manholes and enclosed spaces will be formed at joint pits where construction workers could potentially come into contact with accumulated ground gases.

### Surface runoff

3.3.2.15 Several major and minor surface water bodies have been identified within the study area. During construction, surface water run-off from stockpiled and exposed soils may migrate into on-site or off-site surface water bodies.

3.3.2.16 Other activities associated with the construction works, such as drilling, vehicle movements, and storage of fuels, may result in spills and pollution which could also impact surface watercourses. These pollutant pathways do not relate to contaminated land so are not assessed further in the PRA, however they are assessed in Volume 5, Chapter 6: Hydrology and Hydrogeology of the EIAR.

### Direct contact of building materials with soil and groundwater

3.3.2.17 It is assumed that the temporary compound at the Onshore Substation Site during construction will include staff welfare facilities, to which water may be supplied via mains connections.

3.3.2.18 There is a potential for contaminants to migrate into potable water pipes and taint the water supply if these pipes are laid within contaminated soils.

### Disturbance of UXO

3.3.2.19 There is the potential for disturbance of UXO within Section 1 of the ONEC, associated with the former RAF Banff airfield. UXO may be disturbed where the ground is excavated during cable installation, with the potential for explosion risk.

## 3.3.3 Operational Phase

### Dermal contact, ingestion and inhalation of soils or dust

3.3.3.1 Proposed Development (Onshore) end users and maintenance workers may be impacted by the ingestion of soils and dust should existing contaminated soils be present at or near surface level post completion of the development, or in contact with the proposed buried infrastructure which will require periodic maintenance.

3.3.3.2 Within the ONEC and Landfall Site, the ground surface is anticipated to be returned to its previous land-use. For the majority of the OnTI RLB, this is likely to be agricultural land, and there is a potential for dust to be generated and dispersed by these activities. Any contaminated soils which left in place on completion of the works could present a risk to maintenance workers, adjacent site users (such as nearby residents and workers), and to consumers of agricultural produce.

3.3.3.3 The majority of the Onshore Substation Site will be covered in hard surfacing. However, the Onshore Substation Site will also include areas of landscaping and planting of trees/shrubs for visual mitigation, and in these areas, receptors may come into contact with soils at the surface, or with dust generated from these soils.

## Direct contact of building materials with soil and groundwater

3.3.3.4 There is potential for chemical attack of concrete and other buried material as a result of aggressive ground conditions (pH, chloride and sulphates) encountered. This could result in damage to the OnTI where materials are in direct contact with aggressive soils or groundwater.

3.3.3.5 The Onshore Substation Site will be unmanned throughout its operation, except for visits for maintenance and routine checks. Staff office facilities at the Onshore Substation Site will not include a potable water supply.

## Gas migration

3.3.3.6 The Onshore Substations will include office facilities (enclosed spaces) in which ground gases could potentially accumulate. However, the Onshore Substations will normally be unmanned therefore there will be no long-term or chronic exposure of site users to ground gas.

3.3.3.7 Short-term or acute exposure to ground gases may occur during maintenance activities and site visits within enclosed spaces such as the Onshore Substation buildings. Cable joint pits within the ONEC will be backfilled however each joint pit location will include buried manholes for bonding lead link pits and fibre optic link chambers. Ground gases could potentially accumulate within these buried enclosed spaces.

3.3.3.8 Within the ONEC and Landfall Site, it is unlikely that there will be a pathway for ground gas from made ground or peat as this will be removed during construction and backfilled with clean material in vicinity of enclosed spaces such as joint pits. Any potential shallow ground gas derived from made ground or organic material will dissipate in open air via soft landscaping.

## Surface runoff and infiltration of surface water

3.3.3.9 The ONEC and Landfall Site will be reinstated on completion of the works, and it is considered that there will be no substantial change to the pre-

construction surface runoff or infiltration conditions within the ONEC during operation.

3.3.3.10 Surface water from the Onshore Substation Site will be collected and treated via a Sustainable Urban Drainage Systems (SuDS) attenuation system, before being discharge to a surface watercourse (Burn of Asleid). Surface runoff within the Onshore Substation Site will therefore not infiltrate to the ground.

#### Disturbance of UXO

3.3.3.11 UXO is unlikely to be disturbed during the operational phase. It is assumed that any UXO present within the ONEC would be encountered during construction and dealt with at that time. Therefore, the risk of UXO will not remain during operation.

### 3.3.4 Decommissioning Phase

3.3.4.1 The underground infrastructure within the ONEC will be left in place at the end of its design life to avoid unnecessary disturbance of habitats, therefore it is considered that pathways to contamination associated with the operational phase are also applicable to the decommissioning phase.

3.3.4.2 At the Onshore Substation Site, electrical equipment will be replaced, however there will be no groundworks as part of the decommissioning, therefore it is considered that pathways to contamination associated with the operational phase are also applicable to the decommissioning phase.

## 3.4 Identified Receptors

### 3.4.1 Construction Phase

#### Construction workers and site visitors

3.4.1.1 Construction personnel for the Proposed Development (Onshore) will be the main receptors to potential contamination, via dermal contact, ingestion or inhalation of contaminated soils or dust. Visitors/trespassers to the construction site could also be affected through these pathways.

3.4.1.2 There is also a potential risk to construction workers from ground gas or vapour generated by the ground conditions, which could accumulate within excavations and enclosed spaces.

3.4.1.3 There is also a potential risk to construction workers and site staff associated with potable water supply at construction compounds.

3.4.1.4 There is a potential risk to construction workers and site staff associated with UXO which may be encountered during excavation.

### Offsite neighbours and land users outside the OnTI RLB

3.4.1.5 During construction works, disturbance of the subsurface may generate dust and mobilise contamination off-site. Site workers and neighbours along roads, pavements and residents/workers adjacent to the site could potentially be affected.

### Surface watercourses

3.4.1.6 Several major surface watercourses are present across the OnTI RLB in addition to some minor watercourses and tributaries. All major watercourses flow into Moray Firth which is a designated Marine Protected Area. The River Deveron (intersecting the boundaries of ONEC sections 4 and 5) also flows into a Conservation Area.

3.4.1.7 Impacts on surface watercourses are assessed in full in Volume 5, Chapter 6: Hydrology and Hydrogeology.

### Groundwater bedrock aquifer

3.4.1.8 Shallow rock is present in localised areas across the OnTI RLB. This also includes PWS and other groundwater abstractions including wells and pumps.

3.4.1.9 The bedrock aquifers present are a combination of low to moderate productivity through fracture or discontinuities. Proposed construction within the ONEC may directly impact the bedrock aquifer on site where trenchless crossing including HDD boring is undertaken.

3.4.1.10 Impacts on groundwater are assessed in full in Volume 5, Chapter 6: Hydrology and Hydrogeology.

### Superficial aquifer

3.4.1.11 Part of the OnTI RLB lies within a GDWPA. No superficial aquifer has been identified within the OnTI RLB, and the groundwater regime is largely unknown, however PWS may extract water locally form superficial aquifers.

3.4.1.12 Impacts on groundwater are assessed in full in Volume 5, Chapter 6: Hydrology and Hydrogeology.

## 3.4.2 Operational Phase

### Building material and services

3.4.2.1 Building materials and services including foundations, cable trench Cement Bound Sand (CBS) infill, and buried concrete such as joint pits and manholes are potentially at risk from impacted soils and groundwater, which could damage the buried infrastructure.

### Site end users

3.4.2.2 There will be no permanent site users at the Onshore Substation Site or within the ONEC, and the Proposed Development (Onshore) will only be visited periodically for maintenance purposes.

3.4.2.3 There will be a combination of hardstanding and soft landscaped areas present at the surface at the Onshore Substation Site. For the ONEC, the ground surface will have been reinstated to its previous use, predominantly agricultural fields, with hardstanding present at roads.

3.4.2.4 Short term site users / visitors and farm workers in agricultural land could be at risk of exposure to contaminated materials if left exposed at the surface.

3.4.2.5 During works, a materials management plan must be implemented for any potential contaminated soils which are encountered within the OnTI RLB. These should be removed and should not be used for reinstatement within agricultural fields.

### Maintenance workers

3.4.2.6 Maintenance workers may be affected via dermal contact, ingestion or inhalation of contaminated soils, vapours or gases, or dust if left at or close to surface following construction. A materials management plan must be implemented for any potential contaminated soils which are encountered within the OnTI RLB. These should be removed and should not be used for reinstatement within agricultural fields.

### Adjacent site users

3.4.2.7 Adjacent site users may be affected by ingestion or inhalation of contaminated soils, vapours or gases or dust which could be generate form exposed contaminated soils left at the surface during construction, which could migrate onto adjacent land. A materials management plan must be implemented for any potential contaminated soils which are encountered within the OnTI RLB. These should be removed and should not be used for reinstatement within agricultural fields.

## 3.4.3 Decommissioning Phase

3.4.3.1 The underground infrastructure within the ONEC will be left in place at the end of its design life to avoid unnecessary disturbance of habitats, therefore it is considered that receptors to contamination associated with the operational phase are also applicable to the decommissioning phase.

3.4.3.2 At the Onshore Substation Site, electrical equipment will be replaced, however there will be no groundworks as part of the decommissioning, therefore it is considered that receptors to contamination associated with the operational phase are also applicable to the decommissioning phase.

## 3.5 Preliminary Geo-Environmental Risk Assessments

3.5.1.1 The types, and scale of construction works to be undertaken will vary between the Onshore Substation Site, ONEC and Landfall Site. As the Onshore Substation Site will include occupied buildings, separate PRAs have been produced for the Landfall Site, (PRA 1), Onshore Substation Site (PRA 2) and the ONEC (PRA 3). These PRAs are based on the pathways and receptors identified in sections 3.3 and 3.4.

3.5.1.2 The PRAs are summarised in Table 3-2 to Table 3-4.

### 3.5.2 PRA 1 - Landfall Site

Table 3-2: Landfall Site Preliminary Risk Assessment

| Potential Source | Potential Receptor | Possible Pathways | Likelihood | Severity | Risk | Comment |
|---|---|---|---|---|---|---|
| | **Construction Phase** | | | | | |
| Within the OnTI RLB: Agricultural land use and arable farming, Mill Dam (potential made ground)<br>Off Site: Quarrying and pitting, tank.<br>Potential contaminants which may be encountered on site include Herbicides, pesticides, heavy metals, ash, sulphates, metal fines, asbestos, total petroleum hydrocarbons (TPH), volatile and semi-volatile organic compounds (VOC and SVOC's) and solvents. In addition for tanks; PAH, fuel oils, MTBE.<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds) | Construction personnel for the Proposed Development (Onshore) and visitors to the site during construction. | Dermal contact | Likely | Mild | Moderate / Low | Construction workers likely to be exposed as part of enabling works and construction works, however exposure duration will be short term only. It is considered that the risks posed to construction and maintenance workers shall be mitigated by adoption of appropriate PPE, health and safety briefings, contractor's own risk assessments and appropriate hygiene facilities. Specific health and safety measures will be required for any identified areas of contamination during the works.<br>Note that the current contaminative nature of soils and groundwater beneath the OnTI RLB is largely unknown. Majority of the Landfall Site area comprises agricultural land, where significant sources of contamination are not anticipated. A Ground Investigation is to be undertaken (embedded mitigation) to inform risk assessments and further mitigation measures.<br>Where historic development is present (historic quarrying, structures), the risk to encountering asbestos in soils is considered to be increased, however the historic quarry which was identified through the desk-based review is not located within the OnTI RLB therefore potentially asbestos-containing infill will not be disturbed by the Proposed Development (Onshore). Excavations associated with the Landfall Site works will also not disturb the historic mill dam. |
| | | Ingestion | Likely | Mild | Moderate / Low | |
| | | Inhalation of vapours, dust, and gases | Likely | Mild | Moderate / Low | |
| | | | Unlikely | *Severe (asbestos) | Moderate / Low | |
| | | Gas migration | Unlikely | Medium | Low | |
| | | Contact with contaminated groundwater | Low | Mild | Low | |
| | Offsite neighbours and land users outside the OnTI RLB. | Ingestion, inhalation, and deposition of airborne dust | Low | Mild | Low | Embedded mitigation likely to include dust suppression measures during construction activities at the Landfall Site. Main area of proposed construction works at the Landfall Site are situated at least 400m from the closest residential properties (Dallachy farm buildings), therefore, it is considered unlikely that off-site neighbours will come into direct contact with material from the site which has originated from made ground sources of contamination. |
| | Off-site surface water / marine environment (Moray Firth) | Surface water runoff from drilling works or from soils/materials on site | Low | Mild | Low | Impact on surface water bodies is assessed in Volume 5, Chapter 6: Hydrology and Hydrogeology.<br>Surface water run-off from stockpiled and exposed soils or break out of drilling fluid during the construction phase may migrate into surface water bodies such as the Moray Firth. The contractor shall provide a methodology to manage the surface water run-off in their Construction Environmental Management Plan (CEMP). |
| | Bedrock Aquifer | Preferential pathway for migration created through potential HDD drilling.<br>Lateral and vertical migration fracture flow, or discontinuities. | Likely | Medium | Moderate | Impact on groundwater is assessed in Volume 5, Chapter 6: Hydrology and Hydrogeology.<br>The current contaminative nature of soils and groundwater beneath the site is largely unknown. Leaching potential of subsurface materials – or materials likely to be excavated and reused on site – cannot be confirmed. A Ground Investigation is required to understand the hydrogeological regime and groundwater quality across the site. |
| | Shallow groundwater Superficial Aquifer | Leaching into groundwater and | Low | Medium | Moderate/Low | |

| Potential Source | Potential Receptor | Possible Pathways | Likelihood | Severity | Risk | Comment |
|---|---|---|---|---|---|---|
| | | subsequent flow beneath site | | | | |
| | **Operational Phase and Decommissioning Phase** | | | | | |
| | Site End Users | Dermal contact | Low | Mild | Very Low | Embedded mitigation will include a materials management plan, to be implemented to manage soil arisings on site during construction and which will ensure contaminated materials are not left exposed post-completion. Any contaminated impacted material should be appropriately disposed or reused.<br>It is considered unlikely that shallow groundwater will be encountered by site users post completion of the development. |
| | | Ingestion | Low | Mild | Very Low | |
| | | Contact with contaminated groundwater | Unlikely | Mild | Very Low | |
| | | Inhalation of vapours, dust, and gases | Low | Mild | Very Low | |
| | | Gas migration | Unlikely | Moderate | Low | Transition joint bay anticipated to include an enclosed space in the form of a manhole, into which gases could migrate and accumulate, however, no significant sources of ground gas are anticipated in vicinity of Landfall Site<br>Ground gas regime to confirmed through ground investigation (embedded mitigation) |
| | Maintenance workers | Dermal contact, ingestion and inhalation of soils, dust or groundwater or impacted material | Likely | Mild | Moderate/Low | Maintenance workers may be exposed to impacted material during any maintenance related excavation works post development. However, exposure duration will be short term only.<br>Health and safety risk assessment and management including use of personal protective equipment (PPE) and good hygiene practice throughout any excavation works post development are considered sufficient to mitigate risks presented.<br>Specific health and safety measures will be required for any identified areas of contamination, as included within the Health and Safety file for the OnTI. |
| | Building material and services | Direct contact of building materials with soil and groundwater. | Low | Severe | Moderate | Testing of soils, rock and groundwater to be undertaken (embedded mitigation) to provide robust assessment of ground and groundwater aggressivity in relation to current development proposals and assess risks to buried concrete. Aggressive ground conditions to be factored into the detailed design of buried concrete. |

### 3.5.3 PRA 2 - Onshore Substation Site

Table 3-3: Onshore Substation Site Preliminary Risk Assessment

| Potential Source | Potential Receptor | Possible Pathways | Likelihood | Severity | Risk | Comment |
|---|---|---|---|---|---|---|
| Within the OnTI RLB: Agricultural land use.<br>Off Site: Parkhill Store and Greens Bar, water pump.<br>(Herbicides, pesticides, heavy metals, ash, sulphates, metal fines, asbestos, total petroleum hydrocarbons (TPH), volatile and semi-volatile organic compounds (VOC and SVOC's) and solvents. In addition for Onshore Substation Site; PCB's and mineral oils.)<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds) | **Construction Phase** | | | | | |
| | Construction personnel for the Proposed Development (Onshore) and visitors to the site during construction. | Dermal contact | Likely | Mild | Moderate / Low | Construction workers likely to be exposed as part of enabling works and construction works, however exposure duration will be short term only. It is considered that the risks posed to construction and maintenance workers shall be addressed by embedded mitigation measures including adoption of appropriate PPE, health and safety briefings, contractor's own risk assessments and appropriate hygiene facilities.<br>Noted that the current contaminative nature of soils and groundwater beneath the OnTI is largely unknown. Majority of the Onshore Substation Site area comprises agricultural land, where significant sources of contamination are not anticipated. A Ground Investigation is to be undertaken (embedded mitigation) to inform risk assessments and further mitigation measures.<br>Alluvium soils within the OnTI RLB may include organic layers, which could be a source of ground gas. Gas monitoring may be required to confirm risks and required protection measures for compound buildings during the construction phase. |
| | | Ingestion | Likely | Mild | Moderate / Low | |
| | | Inhalation of vapours, dust, and gases | Likely | Mild | Moderate / Low | |
| | | Gas migration | Likely | Medium | Moderate | |
| | | Contact with contaminated groundwater | Low | Mild | Low | |
| | Offsite neighbours and land users outside the OnTI RLB | Ingestion, inhalation, and deposition of airborne dust | Low | Mild | Low | Assumed dust suppression measures will be adopted during any construction activities (embedded mitigation). Therefore, it is considered unlikely that off-site neighbours will come into direct contact with any contaminated material from the site. |
| | Bedrock Aquifer | Preferential pathway for migration created through potential piled foundations.<br>Lateral and vertical migration fracture flow, or discontinuities. | Likely | Medium | Moderate | Impact on groundwater is assessed in Volume 5, Chapter 6: Hydrology and Hydrogeology.<br>The current contaminative nature of soils and groundwater beneath the site is largely unknown. Leaching potential of subsurface materials – or materials likely to be excavated and reused on site – cannot be confirmed.<br>A Ground Investigation is required to understand the hydrogeological regime and groundwater quality across the site. |
| | Shallow groundwater Superficial Aquifer | Leaching into groundwater and subsequent flow beneath site | Low | Medium | Moderate/Low | Construction will increase infiltration rates in the short term but will decrease infiltration rates in the longer term once surface water drainage systems are constructed. |
| | **Operational Phase** | | | | | |
| | Site End Users | Dermal contact | Low | Mild | Very Low | A materials management plan will be implemented to manage soil arisings on site. Any contaminated material will have been appropriately disposed or encapsulated and should not be left within landscaped areas. It is considered unlikely that shallow groundwater will be encountered by site users post completion of the development. |
| | | Ingestion | Low | Mild | Very Low | |
| | | Contact with contaminated groundwater | Unlikely | Mild | Very Low | |

| Potential Source | Potential Receptor | Possible Pathways | Likelihood | Severity | Risk | Comment |
|---|---|---|---|---|---|---|
| | | Inhalation of vapours, dust, and gases | Low | Mild | Very Low | |
| | | Gas migration | Likely | Medium | Moderate | Onshore Substation Site will include buildings, however these will only be occupied occasionally. Negligible risks associated with radon gas as the Onshore Substation Site will not be permanently occupied. |
| | Maintenance workers | Dermal contact, ingestion and inhalation of soils, dust or groundwater or impacted material | Likely | Mild | Moderate/Low | Maintenance workers may be exposed to impacted material during any excavation works post development. However, exposure duration will be short term only.<br>Health and safety risk assessment and management including use of personal protective equipment (PPE) and good hygiene practice throughout any excavation works post development are considered sufficient to mitigate risks presented.<br>Groundwater is unlikely to be encountered post-development. Specific health and safety measures will be required for any identified areas of contamination, as included within the Health and Safety file for the site. |
| | Building material and services | Direct contact of building materials with soil and groundwater. | Low | Severe | Moderate | Testing of soils, rock and groundwater to be undertaken (embedded mitigation) to provide robust assessment of ground and groundwater aggressivity in relation to current development proposals. |

### 3.5.4 PRA 3 - Onshore Cable Corridor

Table 3-4: ONEC Preliminary Risk Assessment

| Potential Source | Potential Receptor | Possible Pathways | Likelihood | Severity | Risk | Comment |
|---|---|---|---|---|---|---|
| On Site: Agricultural land use and arable farming, quarrying and pitting, Tillynaught to Banff railway line, dismantled railway including station and electrical Onshore Substation Site.<br>Off Site: Quarry, RAF airfield, hoppers and silos, unspecified tanks, mill dam and leads, water pump, vehicle garage, Wind turbine, Sheep wash, smithy, and slating services.<br>(Herbicides, pesticides, heavy metals, ash, sulphates, metal fines, asbestos, total petroleum hydrocarbons (TPH), volatile and semi-volatile organic compounds (VOC and SVOC's) and solvents.<br>(In addition for Onshore Substation Site; PCB's and mineral oils.<br>In addition for unspecified tanks and vehicle garages; PAH, fuel oils, MTBE<br>In addition for railway; fuel oils, PCB's, metal fines, ferrous residues, PAH, lubricating oil, ethylene glycol, creosote.)<br>(In addition, for roads/existing infrastructure: fuel oil, ethylene glycol, solvents, chlorinated solvents and inorganic compounds) | **Construction Phase** | | | | | |
| | Construction personnel for the Proposed Development (Onshore) and visitors to the site during construction. | Dermal contact | Likely | Mild | Moderate / Low | Construction workers likely to be exposed as part of enabling works and construction works, however exposure duration will be short term only. It is considered that the risks posed to construction and maintenance workers shall be managed through embedded mitigation measures including adoption of appropriate PPE, health and safety briefings, contractor's own risk assessments and appropriate hygiene facilities.<br>Note that the current contaminative nature of soils and groundwater beneath the site is largely unknown. Majority of the ONEC comprises agricultural land, where significant sources of contamination are not anticipated, except for in localised areas where alternative land uses and activities have taken place. A Ground Investigation is to be undertaken (embedded mitigation) to inform risk assessments and mitigation measures. Ground investigation should target areas of potential contamination, to inform detailed geo-environmental assessment.<br>The ONEC will not include occupied enclosed spaces during construction.<br>There is a low risk of encountering UXO during the excavation of the ONEC where it is located close to the former RAF Banff airfield. A UXO desk study is recommended within Section 1 of the ONEC to determine whether any mitigation measures are required to deal with the potential risk of UXO during construction. |
| | | Ingestion | Likely | Mild | Moderate / Low | |
| | | Inhalation of vapours, dust, and gases | Likely | Mild | Moderate / Low | |
| | | | *Likely | *Severe (asbestos) | *High | |
| | | Gas migration | Unlikely | Medium | Low | |
| | | Contact with contaminated groundwater | Low | Mild | Low | |
| | | UXO | Low | Severe (explosion) | Moderate / High | |
| | Offsite neighbours and land users outside the OnTI RLB | Ingestion, inhalation, and deposition of airborne dust | Low | Mild | Low | It is considered unlikely that off-site neighbours will come into direct contact with material from the site which has originated from made ground sources of contamination. However, the ground investigation (embedded mitigation) will characterise the level of contamination within area of construction, and this should be used to inform detailed assessment of risk to offsite neighbours. |
| | Surface watercourses (Major and minor watercourses) on site | Surface water runoff from the accumulation of stockpiling | Likely | Mild | Low | Impact on surface water bodies is assessed in Volume 5, Chapter 6: Hydrology and Hydrogeology.<br>Surface water run-off from stockpiled and exposed soils during the construction phase may migrate into surface water bodies on site. The contractor shall provide a methodology to manage the surface water run-off in their CEMP. |
| | Bedrock Aquifer | Preferential pathway for migration created through potential piled foundations.<br>Lateral and vertical migration fracture flow, or discontinuities. | Likely | Medium | Moderate | Impact on groundwater is assessed in Volume 5, Chapter 6: Hydrology and Hydrogeology.<br>The current contaminative nature of soils and groundwater beneath the site is largely unknown. Leaching potential of subsurface materials – or materials likely to be excavated and reused on site – cannot be confirmed.<br>A Ground Investigation is required to understand the hydrogeological regime and groundwater quality across the site. |
| | Shallow groundwater Superficial Aquifer | Leaching into groundwater and subsequent flow beneath site | Likely | Medium | Moderate | |

| Potential Source | Potential Receptor | Possible Pathways | Likelihood | Severity | Risk | Comment |
|---|---|---|---|---|---|---|
| | **Operational Phase** | | | | | |
| | Site End Users | Dermal contact | Low | Mild | Very Low | A materials management plan will be implemented to manage soil arisings on site. Any contaminated material encountered during construction in the ONEC will be appropriately disposed of and will not be used in the reinstatement of agricultural land.<br>It is considered unlikely that shallow groundwater will be encountered by site users post completion of the development. |
| | | Ingestion | Low | Mild | Very Low | |
| | | Contact with contaminated groundwater | Unlikely | Mild | Very Low | |
| | | Inhalation of vapours, dust, and gases | Low | Mild | Very Low | |
| | | Gas migration | Likely | Medium | Low | Confined spaces will be created within the corridor in the form of manholes, into which ground gases could accumulate. Gas monitoring to be undertaken as part of the ground investigation, and design/positioning of manholes to take cognisance of this (embedded mitigation). |
| | Maintenance workers | Dermal contact, ingestion and inhalation of soils, dust or groundwater or impacted material | Likely | Mild | Moderate/Low | Maintenance workers may be exposed to contaminated material during any maintenance related excavation works post development. However, exposure duration will be short term only.<br>Health and safety risk assessment and management including use of personal protective equipment (PPE) and good hygiene practice throughout any excavation works post development are considered sufficient to mitigate risks presented.<br>Groundwater is unlikely to be encountered post-development. Specific health and safety measures will be required for any identified areas of contamination, as included within the Health and Safety file for the site. |
| | Building material and services | Direct contact of building materials with soil and groundwater. | Low | Severe | Moderate | Testing of soils, rock and groundwater is to be undertaken to provide robust assessment of ground and groundwater aggressivity in relation to current development proposals. |

### 3.5.5 Uncertainties in CSM and PRAs

3.5.5.1 There are several uncertainties associated with the preliminary CSM at this stage, including defining the potential sources and the respective pathways.

3.5.5.2 The presence and extent of potential contaminants of concern is largely unknown at this stage. This would require intrusive investigation in relation to the risks to human health, water environment and future structures.

3.5.5.3 A groundwater regime in relation to the mobility of contamination will also require assessment and including the potential risks posed to control water receptors.

3.5.5.4 Ground conditions will require assessment determine potential contamination relating to the potential for ground gas migration via underlying stratum.

3.5.5.5 A UXO Desk Study should be completed to determine the potential risk associated with the ONEC near RAF Banff and identify appropriate mitigation measures during construction.

# 4 Conclusions

4.1.1.1 A desk-based assessment identifying contamination risks has been undertaken for the Landfall Site, ONEC, Onshore Substation Site location and Onshore Grid Connection Export Cable Corridor. Several potential sources of contamination have been identified as part of the study either within the OnTI RLB or within 100m of the OnTI RLB.

4.1.1.2 Historic developments within the OnTI RLB include historic railways, and pits and quarries which are potentially infilled.

4.1.1.3 Construction workers and maintenance workers are considered most likely to come into direct contact with soils that may be contaminated, and shallow groundwater if encountered. It is noted the risk for contamination on site is limited to areas of historic and present development, as the majority of the study area comprises agricultural land where significant contamination is not anticipated.

4.1.1.4 The majority of risks associated with contaminated land will be dealt with by embedded mitigation measures during the design and construction of the development.

4.1.1.5 Embedded mitigation in relation to contaminated land includes completion of an intrusive ground investigation (including analysis of soil, gas and groundwater) to inform detailed assessment of risks, completion of a UXO desk study for Section 1 of the ONEC, and to inform the development of details designs and remediation strategies.

4.1.1.6 Risks to surface water and groundwater as a result of construction works in contaminated land are presented in Volume 5, Chapter 6: Hydrology and Hydrogeology.

4.1.1.7 A material management plan for the disposal, and general assessment of excavated soils will be necessary during the construction phase to determine the risk from any soils used in landscaping.

4.1.1.8 Offsite neighbours and land users outside the OnTI RLB may also be impacted by dust generated from the site through dermal contact, ingestion, and inhalation. This risk has been categorised as low due to the rural location of the proposed works and lack of any population centres within the study area.

4.1.1.9 The contaminative nature of the subsurface requires confirmation through an assessment of the ground investigation chemical test results data. The potential for the attack of corrosive contaminants through direct contact with soils or groundwater on building materials has been deemed a moderate risk on the site, due to the severity of consequences of corrosion and deterioration of building materials. The assessment will identify and confirm the actual risks presented, and furthermore, allow mitigation

measures to be recommended and implemented as part of the construction phase, if required.

4.1.1.10 Ground gas migration from made ground, organic material (peat) or radon has been identified as a potential risk to the development. To fully understand the ground gas regime at the site specific testing is to be undertaken with current guidance and standards. Where the Landfall Site and ONEC is proposed, ground gas will readily dissipate in open space during construction. Depending on the findings, appropriate mitigation measures may be required to be incorporated into the Onshore Substation Site and manholes within the ONEC in relation to ground gas if necessary.

4.1.1.11 There is a low risk of encountering UXO within the section of the ONEC that passes the former RAF Banff airfield. It is recommended that a UXO desk study is completed by a specialist contractor, to provide an initial risk assessment of UXO and recommend any mitigation measures required during construction.

4.1.1.12 Impacts and residual effects on human health as a result of contaminated land are discussed further within Volume 5, Chapter 7: Geology, Soils and Contaminated Land.

# 5 References

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