Scottish & Southern Electricity Networks

TRANSMISSION

Spittal to Loch Buidhe to Beauly 400 kV OHL Connection Environmental Impact Assessment Volume 5 | Technical Appendix

Appendix 10.3 | Groundwater Dependent Terrestrial Ecosystems Assessment

July 2025

VOLUME 5: APPENDIX 10.3 – GROUNDWATER DEPENDENT TERRESTRIAL ECOSYSTEMS ASSESSMENT

Figures (Volume 3 of this EIA Report)

1.1 Introduction

1.1.1 Environmental Resources Management Limited (ERM), on behalf of SSEN Transmission (the Applicant), have produced a Groundwater Dependant Terrestrial Ecosystems (GWDTEs) Assessment which provides a risk assessment of GWDTEs that may be affected by the Spittal to Loch Buidhe to Beauly 400 kV OHL Connection (the Proposed Development).

1.1.2 This technical appendix provides a summary of the GWDTEs that may be affected by the Proposed Development. It should be read in conjunction with the following chapters in **Volume 2** of this Environmental Impact Assessment (EIA) Report:

- **Volume 2, Chapter 3: Description of the Proposed Development,** for details of the Proposed Development and a description of the elements required for the construction and operation. This includes **Volume 3, Figure 3.1: The Proposed Development**;
- **Volume 2, Chapter 8: Ecology and Nature Conservation**, which contains a detailed description of the National Vegetation Classification (NVC) survey undertaken and survey methodology;
- **Volume 2, Chapter 10: Water Environment,** which contains a detailed description of the local hydrology and hydrogeology, flow mechanisms, and hydraulic properties of the soils and geology; and
- **Volume 2, Chapter 11: Geological Environment**, which contains details of peat depths and superficial and bedrock geology.

1.1.3 Excavation of soil and bedrock during the construction phase of the Proposed Development may cause localised disruption and interruption to groundwater flow. Interruption of groundwater flow could potentially reduce the supply of groundwater to GWDTEs, thereby causing an alteration or change in the quantity of groundwater. In addition, the quality of groundwater may be impacted e.g. chemical pollution of groundwater, both of which could change the physical or biological characteristics of the GWDTE.

1.1.4 This assessment aims to determine the groundwater dependency of potential GWDTE habitats identified through NVC surveying, and thus the potential impacts to these habitats as a result of potential disturbance to groundwater flows. The hydrology / hydrogeological assessment analyses the bedrock geology, superficial geology, hydrogeology, surface water hydrology, terrain, and peat data to determine if habitats have the potential to be groundwater dependent or rainwater fed (ombitrophic).

1.2 Legislation

1.2.1 The principal legislation regarding the water environment in Scotland is provided by the EU Water Framework Directive (WFD[1]) which aims to protect and enhance the quality of surface freshwater (including lakes, rivers, and streams) groundwater, GWDTEs, estuaries and coastal waters.

1.2.2 The key objectives of the WFD relevant to this assessment are:

- To prevent deterioration of, and enhance, aquatic ecosystems; and
- To establish a framework for protection of surface freshwater and groundwater.

[1] European Parliament (2000) 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 ("The Water Framework Directive"). Available online at: http://ec.europa.eu/environment/water/water-framework/index_en.html

1.2.3 The WFD resulted in the Water Environment and Water Services (Scotland) Act 2003 (WEWS Act[2]), which gives Scottish Ministers powers to introduce regulatory controls over water activities to protect, improve and promote sustainable use of Scotland's water environment.

1.2.4 The protection of GWDTEs in Scotland is regulated within the Water Environment (Controlled Activities) (Scotland) Regulations 2011[3] (as amended) (CAR).

1.3 Guidance

1.3.1 This assessment has followed these guidance documents:

- Scottish Environment Protection Agency (SEPA) Guidance: Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems[4]**Error! Bookmark not defined.**; and
- Botanaeco GWDTE Decision Tool[5].

1.4 Methodology

Field Survey

1.4.1 NVC surveys were completed to identify potential GWDTEs based on vegetation present. The NVC surveys followed the methodology described in best practice guidance[6] with communities identified by eye.

1.4.2 Surveys were undertaken between April and October 2024, with additional surveys undertaken in January 2025. The surveys were undertaken within a 700 m survey corridor centred around the OHL. This included surveys within the 100 m Limit of Deviation (LoD) (which is the maximum extent within which the Proposed Development can be built) and extended by 250 m on either side of the LoD as it is considered possible that groundwater impacts associated with the Proposed Development may affect habitats out to this distance. Further survey details are provided in **Volume 2, Chapter 8: Ecology and Nature Conservation.**

1.4.3 The potential groundwater dependency of each community / habitat identified through the NVC survey has been based on SEPA GWDTE Guidance[4] and the SEPA classification is modified from the United Kingdom Technical Advisory Group (UKTAG) list of NVC communities[7]. These score each NVC community by its dependency on groundwater rating the GWDTE as having a High, Moderate, or Low groundwater dependency.

1.4.4 Where no GWDTEs or likely GWDTEs were present, habitats were not mapped.

1.4.5 **Volume 3, Figure 10.7: Groundwater Dependent Terrestrial Ecosystems** shows the areas considered as having the potential to be Highly or Moderately groundwater dependent based on the NVC survey.

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[2] Scottish Government (2003). Water Environment and Water Services (Scotland) Act 2003. Available online at: https://www.legislation.gov.uk/asp/2003/3/contents

[3] Scottish Government (2011). The Water Environment (Controlled Activities) (Scotland) Regulations 2011. Available online at: https://www.legislation.gov.uk/ssi/2011/209/contents/made

[4] SEPA (2024) Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems. Available online at: guidance-on-assessing-the-impacts-of-developments-on-groundwater-dependent-terrestrial-ecosystems.docx (Accessed: March 2025)

[5] Botanaeco (2019) GWDTE Decision Tool. Available online at: https://botanaeco.co.uk/gwdte (Accessed March 2025)

[6] Joint Nature Conservation Committee (2006) National Vegetation Classification: Users' handbook. JNCC, Peterborough. Available online at: https://hub.jncc.gov.uk/assets/a407ebfc-2859-49cf-9710-1bde9c8e28c7 (Accessed: March 2025)

[7] UK Technical Advisory Group on the Water Framework Directive (2004) Guidance on the identification and risk assessment of groundwater dependent terrestrial ecosystems. Available online at: https://www.wfduk.org/resources%20/risk-assessment-groundwater-dependent-terrestrial-ecosystems (Accessed March 2025)

Desk Study

1.4.6 The Study Area for this assessment comprises the Proposed Development alignment LoD plus a 250 m buffer on both sides of the alignment as well as the hydrological catchment areas that interact with the Proposed Development.

1.4.7 The baseline hydrology and geology of the Study Area has been characterised as part of this EIA Report and is detailed within **Volume 2, Chapter 10: Water Environment** and **Volume 2, Chapter 11: Geological Environment**. A summary of the relevant baseline conditions is provided in **Section 10.5** of this technical appendix.

1.4.8 The assessment has utilised the following datasets:

- Ordnance Survey (OS) 1:50,000 and 1:25,000 scale mapping;
- OS Terrain 5 Digital Terrain Modelling (DTM);
- OS OpenData Hydrography Datasets[8];
- Flood Estimation Handbook (FEH) web service[9];
- Scotland's Environment web-based maps[10];
- British Geological Survey (BGS) Onshore GeoIndex Viewer[11] 1:50,000 scale mapping for bedrock and superficial geology (purchased BGS dataset), 1:625,000 for hydrogeology;
- BGS groundwater vulnerability (Scotland) map, Version 2[12]; and
- Data provided by the Applicant including tower foundation and track design specifications.

Hydrological Analysis

1.4.9 Following the initial identification of habitats with the potential to be GWDTEs based on NVC surveying, ERM hydrologists assessed the site-specific conditions and hydrological context of potential GWDTEs to qualitatively determine the groundwater dependency of potential GWDTEs.

1.4.10 The assessment was based on the Botanaeco GWDTE Decision Tool[5] which considers:

- The direct hydrological connection of a potential GWDTE to surface water sources;
- Underlying geological conditions including the productivity of bedrock and superficial geology, the presence of peat souls and permeability of upgradient geology;
- The presence of indicative 'flush' patterns of vegetation communities; and
- Land use.

1.4.11 Analysis of the hydrological regime of the Study Area was carried out using a OS Terrain 5 Digital Terrain Model (DTM) which is a 5 m x 5 m surface terrain dataset, and the ESRI ArcGIS Pro hydrological toolset. This

[8] Scottish Environment Protection Agency (SEPA) SEPA Hydrography Service. Available online at: https://www.data.gov.uk/dataset/2814d7f6-c205-4ef7-b11c-c75f926b4ace/sepa-hydrography-service-wms (Accessed December 2024)
[9] UK Centre for Ecology and Hydrology. Flood Estimation Handbook Web Service. Available online at: https://fehweb.ceh.ac.uk/Map (Accessed March 2025)
[10] Scotland's Environment (various) Scotland's Environment Map. Available online at: https://www.environment.gov.scot/maps/scotlands-environment-map/ (Accessed December 2024)
[11] British Geological Survey (BGS). Geoindex Onshore Map Viewer. Available online at: https://mapapps2.bgs.ac.uk/geoindex/home.html (Accessed December 2024)
[12] British Geological Survey (BGS) (2011) User Guide: Groundwater Vulnerability (Scotland) GIS dataset, Version 2. Available online at: https://nora.nerc.ac.uk/id/eprint/17084/1/OR11064.pdf (Accessed December 2024)

toolset provides methods for describing the physical components of a surface, allowing identification of sinks (areas where surface water could pond), determination of likely flow direction and routes where flow accumulation would occur, delineation of watersheds, and mapping of stream networks.

1.4.12 The Topographic Wetness Index (TWI) of the Study Area was also calculated using the OS Terrain 5 DTM and the ESRI ArcGIS Pro hydrological toolset. The toolset combines the local upslope contributing area of flow with slope to assign a relative score indicating hydrological flow paths and probable areas of surface water accumulation. The indicative wetness index was also used to assess the potential habitats to be surface water dependent.

1.4.13 Where GWDTEs were found to be in direct connectivity to surface water features i.e. they overlap with the stream network, OS mapped watercourses, or areas with a high TWI value, they are considered to have a lower likelihood of groundwater dependency. Where the habitats are associated with for example a spring, high productivity aquifer, or there is no obvious connection to a surface water source, the habitat is considered to potentially be groundwater dependent.

Sensitivity of Groundwater Dependant Habitats

1.4.14 The UKTAG (2004) guidance[7] provides criteria for identification and inclusion of GWDTEs in the risk assessment process based on complementary ecological and hydrogeological assessments. These criteria have been used to produce the following matrix (**Table 1**). The matrix allows identification of those habitats which are considered sensitive or potentially sensitive and which require mitigation to prevent impacts from the Proposed Development.

Table 1: Matrix for Identification of Sensitive GWDTEs from Ecological and Hydrogeological Assessments

		Hydrogeological Assessment Groundwater Dependency Level		
		High Likelihood	**Moderate Likelihood**	**Low Likelihood**
Ecological Assessment of NVC Communities	**Highly groundwater dependent**	Sensitive GWDTE	Potentially sensitive GWDTE	Potentially sensitive GWDTE
	Moderately groundwater dependent	Potentially sensitive GWDTE	Potentially sensitive GWDTE	Not sensitive
	Not groundwater dependent	Potentially sensitive GWDTE	Not sensitive	Not sensitive

Limitation and Assumptions

1.4.15 The baseline conditions rely on datasets provided by third parties, and it is assumed these are datasets are accurate and reliable.

1.4.16 The NVC habitat surveys provide a snapshot of ecological conditions and do not record plants that may be present in the field survey area at different times of the year.

1.4.17 As per **Volume 2, Chapter 10: Water Environment**, a ground truthing survey was undertaken between May 2024 and January 2025. The ground truthing survey focused on verifying the findings of the desk-based study, identifying key hydrological receptors, obtaining details of watercourses subject to crossings and visiting GWDTEs that were identified by the project ecology team.

1.5 Baseline Conditions

Section A – Spittal to Brora

Surface Water Features

1.5.1 This section of the Proposed Development spans from Spittal to Brora. The Proposed Development travels over the following SEPA Main River catchments which are listed below from north to south and are shown in **Volume 3, Figure 10.3 Surface Water Catchments**:

- River Thurso;
- Wick River;
- Wick Coastal;
- Dunbeath Water;
- Berriedale Water;
- Brora Coastal; and
- River Helmsdale.

1.5.2 The River Thurso catchment drains north eventually discharging into the North Sea at Thurso. The rest of the catchments across Section A drain in a southeasterly direction into the North Sea along Scotland's northeast coast.

1.5.3 Several watercourses and numerous tributaries (named and un-named) traverse each of the catchments above and flow through the areas of potential GWDTE habitats as shown on **Volume 3, Figure 10.7: Groundwater Dependent Terrestrial Ecosystems**. The watercourses and tributaries associated with GWDTEs within this Section include Little River, Burn of Braehungie Achorn Burn, Dunbeath Water, Allt na Buaidhe, Loth Burn, Sletdale Burn, and Kintradwell Burn.

1.5.4 More detailed descriptions of the local hydrology in relation to each of the GWDTE habitats is provided in **Table 2** and **Table 3** of this technical appendix.

Terrain

1.5.5 The OS Terrain 5 DTM dataset indicates that ground elevations within Section A of the Proposed Development vary between 20 m and 380 m AOD. The lowest elevations are associated with the banks of watercourses and the highest elevation is associated with the hills near Glen Sletdale.

1.5.6 The GWDTE habitats dominate large areas scattered across the whole of Section A and are associated with open heathland where the topography is gently undulating, or are located on the slopes of small hills. Where the habitats are associated with hillslopes there is likely to be a higher level of surface water runoff flowing downslope across the GWDTE habitats and route of the Proposed Development.

Geology

1.5.7 The 1:50,000 scale mapping for bedrock and superficial geology from the BGS GeoIndex Viewer[11] indicates that there are several bedrock formations underlying Section A of the Proposed Development including the:

- Spital Flagstone Formation;
- Berriedale Sandstone Formation;
- Lybster Flagstone Formation;
- Ben Dorrery Conglomerate Member;

- Kildonan Psammite Formation;
- Helmsdale Granite;
- Badbea Breccio – Conglomerate Member;
- Braemore Mudstone Formation;
- Ousdale Arkose Formation; and
- Langwell Conglomerate Member.

1.5.8 The 1:50,000 scale mapping for bedrock and superficial geology from the BGS GeoIndex Viewer[11] indicates that the most common superficial deposits mapped throughout Section A of the Proposed Development are peat and glacial till.

Hydrogeology

1.5.9 The BGS GeoIndex Viewer[11] indicates the majority of underlying aquifer in Section A, specifically north of Helmsdale, to be composed of moderately productive aquifer formed from middle old red sandstone. In some areas southwest of Helmsdale towards Brora, the underlying aquifer is categorised as low productivity with a composition of unnamed igneous extruded rock units. Hydrogeology across the Proposed Development is illustrated in **Volume 3, Figure 10.5: BGS 625,000 Scale Hydrogeology.**

1.5.10 The BGS GeoIndex Viewer[11] indicates the Caithness groundwater body (ID: 150692) has an aquifer typology of Old Red Sandstone and has low to high aquifer productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Northern Highlands groundwater body has an aquifer typology of Precambrian North and has low or very low productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Brora groundwater body Old Red Sandstone North and has low to high aquifer productivity. It is overlain by moderate to low permeability strata which is several metres thick. Groundwater catchments across the Proposed Development are illustrated in **Volume 3, Figure 10.4: Groundwater Classifications**.

Section B - Brora to Loch Buidhe

Surface Water Features

1.5.11 This section of the Proposed Development spans from Brora to Loch Buidhe. The Proposed Development travels over three catchments which are listed below from north to south and are shown in **Volume 3, Figure 10.3: Surface Water Catchments**:

- Brora Coastal;
- River Brora; and
- River Fleet.

1.5.12 These catchments all drain southeasterly into the North Sea on Scotland's northeast coast.

1.5.13 Several watercourses and numerous tributaries (named and un-named) traverse each of the catchments above and flow through the areas of potential GWDTE habitats as shown on **Volume 3, Figure 10.7: Groundwater Dependent Terrestrial Ecosystems**. The watercourses and tributaries associated with GWDTEs within this Section include: Clynemilton Burn, Allt nam Ban, Allt nan Sgeith, River Fleet, and Abhainn an t-Stratha Charnaig.

1.5.14 More detailed descriptions of the local hydrology in relation to each of the GWDTE habitats is provided in **Table 2** and **Table 3** of this technical appendix.

Terrain

1.5.15 The OS Terrain 5 DTM dataset indicates that ground elevations within Section B of the Proposed Development vary between 10 m AOD on the banks of the River Fleet and 410 m AOD south of Ben Horn.

1.5.16 The GWDTE habitats dominate large areas of open heathland where the topography is gently undulating or are located on the slopes of small hills. Heathland habitat is largely concentrated in the north and centre of Section B. Where the habitats are associated with hillslopes there is likely to be a higher level of surface water runoff flowing downslope across the GWDTE habitats and route of the Proposed Development.

Geology

1.5.17 The 1:50,000 scale mapping for bedrock and superficial geology from the BGS GeoIndex Viewer[11] indicates that there are several bedrock formations underlying Section B of the Proposed Development including:

- Kildonan Psammite Formation;
- Badbea Creccio – Conglomerate Member;
- Berriedale Sandstone Formation;
- Ulbster Sandstone Formation;
- Langwell Conglomerate Member (Conglomerate);
- Altnaharra Psammite Formation; and
- Lewisian Complex.

1.5.18 The 1:50,000 scale mapping for bedrock and superficial geology from the BGS GeoIndex Viewer[1111] indicates that the most common superficial deposits mapped throughout Section B of the Proposed Development are peat and glacial till.

Hydrogeology

1.5.19 The BGS Geoindex Viewer[11111111] indicates that Section B is prominently formed of two units of Old Red Sandstone and Middle Old Red Sandstone which run approximately parallel to the coastline underlying the Proposed Development north to south from the start of Section B roughly until the River Fleet valley. These units are defined as moderately productive aquifers.

1.5.20 From the River Fleet to Loch Buidhe, the Proposed Development is underlain by Morar Group and Lewisian Complex rock units which are both low productivity aquifers.

1.5.21 The Northern Highlands groundwater body (ID: 150701) has an aquifer typology of Precambrian North and has low or very low productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Brora groundwater body (ID: 150703) is Old Red Sandstone North and has low to high aquifer productivity. It is overlain by moderate to low permeability strata which is several metres thick.

Section C - Loch Buidhe to Dounie

Surface Water Features

1.5.22 This section of the Proposed Development travels from Loch Buidhe to Dounie. Section C of the Proposed Development travels over five catchments which are listed below from north to south and are shown in **Volume 3, Figure 10.3: Surface Water Catchments**:

- River Fleet;
- Dornoch Coastal;

- River Shin;
- Dornoch Firth; and
- River Carron.

1.5.23 The River Fleet catchment drains southeast into Loch Fleet then into the North Sea. All other surface water catchments across Section C discharge into the Dornoch Firth as shown in **Volume 3, Figure 10.2: Surface Watercourses and Waterbodies**.

1.5.24 Several watercourses and numerous tributaries (named and un-named) traverse each of the catchments above and flow through the areas of potential GWDTE habitats as shown on **Volume 3, Figure 10.7: Groundwater Dependent Terrestrial Ecosystems**. The watercourses and tributaries associated with GWDTEs within this Section include: Allt Garbh, Allt Loch Laro, Alltan Dubh, Allt na Ciste Duibhe, and Henman's Burn.

1.5.25 More detailed descriptions of the local hydrology in relation to each of the GWDTE habitats is provided in **Table 2** and **Table 3** of this technical appendix.

Terrain

1.5.26 The OS Terrain 5 DTM dataset indicates that ground elevations within Section C of the Proposed Development range from approximately 10 m AOD adjacent to the Kyle of Sutherland to 200 m AOD in the eastern extents of Section C.

1.5.27 The GWDTE habitats dominate areas of open heathland where the topography is gently undulating or are located on gentle slopes. Where the habitats are associated with hillslopes there is likely to be a higher level of surface water runoff flowing downslope across the GWDTE habitats and route of the Proposed Development.

Geology

1.5.28 The 1:50,000 scale mapping for bedrock and superficial geology from the BGS GeoIndex[1111] indicates that Section C of the Proposed Development is underlain by the Altnaharra Psammite Formation.

1.5.29 The 1:50,000 scale mapping for bedrock and superficial geology from the BGS GeoIndex[11] indicates that the most common superficial deposits mapped throughout Section C of the Proposed Development are peat, till and morainic deposits.

Hydrogeology

1.5.30 The BGS Geoindex Viewer[11] indicates that Section C is of the Proposed Development from Loch Buidhe to the River Carron is underlain by Morar Group bedrock aquifer, characterised as a low productivity aquifer with small amounts of groundwater in near surface weathered zone and secondary fractures.

1.5.31 The Section is located upon the Northern Highlands groundwater body (ID: 150701) with an aquifer typology of Precambrian North which has a low or very low productivity.

Section D - Dounie to Near Strathpeffer

Surface Water Features

1.5.32 This section of the Proposed Development spans from Dounie to near Strathpeffer. The Proposed Development travels over five catchments which are listed below from north to south and are shown in **Volume 3, Figure 10.3: Surface Water Catchments**:

- River Carron;

- Dornoch Coastal;
- River Alness;
- River Glass; and
- Cromarty Coastal.

1.5.33 The River Carron catchment drains in an easterly direction into the Dornoch Firth on the east coast of Scotland. The Dornoch Coastal catchment drains north also discharging into the Dornoch Firth. The River Alness and River Glass catchments drain southeast into the Cromarty Firth as does the Cromarty Coastal catchment.

1.5.34 Several watercourses and numerous tributaries (named and un-named) traverse each of the catchments above and flow through the areas of potential GWDTE habitats as shown on **Volume 3, Figure 10.7: Groundwater Dependent Terrestrial Ecosystems.** The watercourses and tributaries associated with GWDTEs within Section D include: River Carron, River Avron, and Abhainn Sgitheach,

1.5.35 More detailed descriptions of the local hydrology in relation to each of the GWDTE habitats is provided in **Table 2** and **Table 3** of this technical appendix.

Terrain

1.5.36 The OS Terrain 5 DTM dataset indicates that ground elevations vary significantly throughout Section D, ranging from approximately 30 m AOD in the northern extents adjacent to the River Carron to approximately 440 m AOD on the eastern flanks of Carn Beag.

1.5.37 The GWDTE habitats dominate areas of open heathland and grassland where the topography is gently undulating or are located on the slopes of small hills. Where the habitats are associated with hillslopes there is likely to be a higher level of surface water runoff flowing downslope across the GWDTE habitats and route of the Proposed Development.

Geology

1.5.38 The 1:50,000 scale mapping for bedrock and superficial geology from the BGS GeoIndex[11] indicates Section D of the Proposed Development is predominantly underlain by metamorphic and sedimentary bedrock formations.

1.5.39 The 1:50,000 scale mapping for bedrock and superficial geology from the BGS GeoIndex[11] indicates that the most common superficial deposits mapped throughout Section D of the Proposed Development are till, morainic deposits and peat.

Hydrogeology

1.5.40 The BGS Geoindex Viewer[11] indicates that the northern half of Section D, approximately from River Carron to Loch Morie, is composed of several units of Morar Group rocks, with a single igneous intrusion present to the west. All these units act as low productivity aquifers. Loch Morie to near Strathpeffer is underlain by a mixture of lower old red sandstone, a moderately productive aquifer and Loch Eil group rocks, a low productivity aquifer.

1.5.41 The Northern Highlands groundwater body (ID: 150701) has an aquifer typology of Precambrian North and has low or very low productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Invergordon groundwater body (ID: 150679) is Old Red Sandstone North and has low to high aquifer productivity. It is overlain by moderate to low permeability strata which is several metres thick.

Section E - Near Strathpeffer to Beauly

Surface Water Features

1.5.42 This section of the Proposed Development spans from near Strathpeffer to Beauly. The Proposed Development travels through three catchments which are listed below from north to south and are shown in **Volume 3, Figure 10.3: Surface Water Catchments**:

- Cromarty Coastal;
- River Conon; and
- River Beauly.

1.5.43 The Cromarty Coastal catchment drains in an easterly direction and discharges into the Cromarty Firth. The River Conon catchment drains east eventually discharging into the Dornoch Firth. The River Beauly catchment drains northeast into the Beauly Firth near Inverness.

1.5.44 Several watercourses and numerous tributaries (named and un-named) traverse each of the catchments above and flow through the areas of potential GWDTE habitats as shown on **Volume 3, Figure 10.7: Groundwater Dependent Terrestrial Ecosystems**. The watercourses and tributaries associated with GWDTEs within this Section include; Loch na Crann, River Orrin, Allt Fionnaidh and River Conon.

1.5.45 More detailed descriptions of the local hydrology in relation to each of the GWDTE habitats is given in **Table 2** and **Table 3** of this technical appendix.

Terrain

1.5.46 The OS Terrain 5 DTM dataset indicates that ground elevations within Section E of the Proposed Development vary between 15 m AOD near Tower S175 adjacent to the River Conon in the north of Section E, to 368 m AOD near Tower S210 in the centre of Section E.

1.5.47 The GWDTE habitats dominate areas of open moorland where the topography is gently undulating or are located on the slopes of small hills. Where the habitats are associated with hillslopes there is likely to be a higher level of surface water runoff flowing downslope across the GWDTE habitats and route of the Proposed Development.

Geology

1.5.48 The 1:50,000 scale mapping for bedrock and superficial geology from the BGS GeoIndex Viewer[11] indicates that there are several bedrock formations underlying Section E of the Proposed Development including;

- Braemore Mudstone Formation;
- Ousdale Arkose Formation;
- Tarvie Psammite Formation;
- Achnaconeran Striped Formation; and
- Caledonian Supersuite.

1.5.49 The 1:50,000 scale mapping for bedrock and superficial geology from the BGS GeoIndex Viewer[11] indicates that the most common superficial deposits mapped throughout Section E of the Proposed Development are glacial and fluvial derived deposits and peat.

Hydrogeology

1.5.50 The BGS Geoindex Viewer[11] indicates that near Strathpeffer to Loch Kinellan Section E is underlain by Loch Eil group rock, which is a low productivity aquifer. Loch Kinellan to Loch nan Eun is underlain by a single unit of lower old red sandstone, defined as a moderately productive aquifer. From Loch nan Eun to Aigas Power Station on the banks of River Beauly, the Proposed Development is underlain by Glenfinnan and Loch Eil rock units, both low productivity aquifers. The end of Section E, on the east bank of River Beauly, is once again underlain by lower old red sandstone, a moderately productive aquifer.

1.5.51 The Muir of Ord groundwater body (ID: 150619) is Old Red Sandstone North and has low to high aquifer productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Northern Highlands groundwater body (ID: 150701) has an aquifer typology of Precambrian North and has low or very low productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Invergordon groundwater body (ID: 150679) is Old Red Sandstone North and has low to high aquifer productivity. It is overlain by moderate to low permeability strata which is several metres thick.

1.6 Groundwater Dependency Assessment

1.6.1 **Table 2** contains the detailed assessment of Moderate GWDTEs (based on the NVC classification) in Sections A-E of the Proposed Development and the groundwater dependency based on the outcome of the hydrological assessment of the habitats.

1.6.2 **Table 3** contains the detailed assessment of High GWDTEs (based on the NVC classification) in Sections A-E of the Proposed Development and the groundwater dependency based on the outcome of the hydrological assessment of the habitats.

Table 2: Moderate GWDTE Habitat Assessment

NVC Code	NVC Community	Section	GWDTE Location	Potential Groundwater Dependency based on NVC Code	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
M15	*Trichophorum cespitosum - Erica tetralix wet heath*	Section A	• Clusters to the east of N40 and N41, within the Study Area. • Clusters around N58 – N62 within the Study Area. • Area directly beneath N84 – N86 and associated temporary tower compound areas. • Area northeast of N89, as well as a large area beneath N88 – N91A. • Large area beneath N92 and N93 and near to N94. • Area beneath the OHL and proposed access track between N97 and N98. • Area directly beneath the OHL between N98 and N99. • Area west of N99, within the Study Area. • Area crosses directly beneath N101. This area is also near to N102. • Large, clustered areas to the east of N180, within the Study Area. • Large area directly beneath the OHL and N181. • Large clusters directly beneath the OHL and N184 and N185. This clustered area also lies near to N186. • Small area between N187 and N188, within the Study Area. • Small areas northwest of N197, directly beneath the access track to N197. • A very small thin area of habitat lies west of N198, within the Study Area. • Two large, clustered areas lie west of N199 and N200, and northwest of N201, within the Study Area.	Moderate	The watercourses and stream network show that there are drainage pathways which flow through the GWDTE habitat at N40 - N41 associated with Little River. This suggests the habitat is reliant upon drainage pathways to the watercourse. In addition, it is located on a hillslope where higher levels of runoff would be expected. The habitat is also within an area classified as being underlain by a low productivity aquifer. The watercourses and stream network show that there are drainage pathways through the GWDTE habitat at N58 - N62 associated with Burn of Braehungie. This suggests the habitat is reliant upon surface water inputs. In addition, it is located on a hillslope where higher levels of runoff would be expected. The habitat is also within an area classified as being underlain by a low productivity aquifer. There is one habitat covering N84-86 with a pinch point between N84 and N85. The habitat is discussed as two sections: the area around N84 south to the pinch point (northern habitat extent), and the area south of the pinch point beneath N85 and N86 (southern habitat extent): The habitat at N84 is located on a plateau above the Dunbeath Water. There is an approximately 50 m change in elevation between the habitat beneath N84 and the Dunbeath Water, meaning it is disconnected from the active floodplain of the river. This is confirmed by the SEPA Flood Mapping which shows the areas beneath the cliff as having minimal overlap with the high likelihood (1 in 10 year) flood extent. The stream network shows a watercourse on southern fringes of the northern habitat extent, and the OS Vector mapping shows one field drain running through the habitat to the southeast, but the TWI does not indicate high levels of topographic wetness around the field drain or the rest of the northern extent habitat across the plateau. The underlying hydrogeology is a low productivity aquifer, but based on the topography, TWI, and stream network, it is difficult to rule out an element of groundwater dependency in the northern extent of the habitat. It is therefore still considered moderately groundwater dependent. The southern habitat extent between N85– N86 is located on the hillslopes above the Achorn Burn. The stream network indicates flow through this area is to the south, and there are a number of drainage pathways through the habitat. The TWI also shows higher levels of wetness within the southern habitat extent, particularly along the southeast boundary of the habitat. In addition, the underlying hydrogeology is a low productivity aquifer. Therefore, it is concluded the southern habitat extent is sustained by the rainfall runoff rather than by groundwater. The TWI indicates pooling of surface water through the GWDTE habitat at N89 which flows towards the Allt Tarsuinn. This suggests the habitat is reliant upon rainfall and surface water runoff. In addition, it is located on a hillslope where higher	All habitats are considered to be surface water dependent / have a low groundwater dependency with the exception of: • the habitat at N84.	N40 and N41 both lie 250 m away from the habitat. However, the associated tower temporary tower compound areas around N40 and N41 lie 200 m from the habitat. N58 lies 80 m from the habitat and the N58 temporary tower compound area lies 50 m from the habitat. N59 lies 110 m from the habitat and the N59 temporary tower compound area lies 80 m from the habitat. N60 lies 60 m from the habitat and the N60 temporary tower compound area lies 20 m from the habitat. N61 lies 120 m from the habitat and the N61 temporary tower compound area lies 60 m from the habitat. N62 lies 100 m from the habitat and the N62 temporary tower compound area lies 50 m from the habitat. A large area of the M15 habitat crosses directly beneath the OHL and directly below N84 - N86 and the associated temporary tower compound areas. The habitat at N84 which is considered the have the potential to be groundwater dependent is within the Study Area. N89 lies 70 m from a small area which includes M15 habitat and the N89 temporary tower compound area lies 50 m from the habitat. A large area which contains the M15 habitat lies beneath the OHL and directly crosses N88 - N91A, and their associated temporary tower compound areas.

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			• Two large areas lie beneath the long access track at the end of Section A, which connects the shorter access tracks to N198 and N202. The first area lies directly beneath the access track east of N201. The second area lies across the same access track but further south, towards the A9 road.		levels of runoff would be expected. The habitat is also within an area classified as being underlain by a low productivity aquifer. The habitat between N88 - N91A is located on the banks of the Allt Tarsuinn and the stream network indicates additional drainage pathways through the habitat. The underlying hydrogeology is a low productivity aquifer, and the topography is gently sloping. This suggests the habitat here is reliant on surface water and not groundwater. The habitat at N92-94 is located in a low lying area. It is not located near an OS mapped watercourse and the stream network does not indicate flowpaths through the area. However, the habitat is underlain by a low productivity aquifer and the aerial imagery indicates the land had been worked with potential drainage channels in the landscape. These would support the conclusion that the habitat is likely to be surface water fed. The GWDTE habitat at N97 - N99 are located on the hillslope above the Allt na Buaidhe where higher levels of runoff would be expected. The stream network shows that there are drainage pathways through the habitat, and this would suggest the habitat is reliant upon rainfall rather than groundwater. The habitat is also within an area classified as being underlain by a low productivity aquifer. The GWDTE habitat at N101 and N102 is located on the steep hillslope of Beinn nan Coireag where higher levels of runoff would be expected. The stream network shows that there are drainage pathways through the habitat which flow down to the coast. The habitat is within an area classified as being underlain by a moderately productivity aquifer, but based on topography and the flowpath analysis the habitat is not considered groundwater dependent and is instead reliant upon surface water runoff. The habitats between N180 - N181 are all located on the banks of the Loth Burn. As such they are within the floodplain of the watercourse.The stream network indicates flow through the habitat at N181, although not at N180. The habitat is within an area classified as being underlain by a moderately productivity aquifer but based on the proximity of the habitats to a large watercourse and being at the bottom of a hillslope, the habitat is not considered reliant on groundwater. The habitat areas at N184 - N186 are all located north of the Sletdale Burn at the base of steep hillslopes. The stream network shows many drainage pathways through the GWDTE habitats. Although underlain by a moderately productivity aquifer, the topography and stream network indicate the habitats are fed by surface water runoff from the hillslope. The habitat between N187 and N188 is also located on the banks of the Sletdale Burn, down and at the bottom of a steep hillslope. The habitat is therefore within the		A large area which contains the M15 habitat lies beneath the OHL and directly crosses N92 and N93, and their associated temporary tower compound areas. N94 lies 150 m from an area containing the M15 habitat and the N94 temporary tower compound area lies 100 m from the habitat. An area which contains the M15 habitat directly lies beneath the OHL and proposed access track between N97 and N98. N97 lies 95 m from the habitat and the N97 temporary tower compound area lies 50 m from the habitat. An area which contains the M15 habitat directly lies beneath the OHL between N98 and N99. N98 lies 55 m from the habitat and the N98 temporary tower compound area lies 5 m from the habitat. N99 lies 100 m from an area which includes M15 habitat and the N99 temporary tower compound area lies 50 m from the habitat. An area which contains the M15 habitat lies beneath the OHL and directly beneath N101, and its' associated temporary tower compound area. N102 lies 85 m from an area which includes M15 habitat and the N102 temporary tower compound area lies 50 m from the habitat. N180 lies 90 m from an area which includes M15 habitat and the N180 temporary tower compound area lies 70 m from the habitat. An area which contains the M15 habitat lies beneath the OHL and directly beneath N181, and its' associated temporary tower compound area. The cluster of areas which contains the M15 habitat lies beneath the OHL and directly beneath N184 and N185, and their associated temporary tower compound areas.

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					floodplain of the Sletdale Burn and the stream network show that there is hillside runoff through the GWDTE habitat. The habitat is within an area classified as being underlain by a moderately productivity aquifer but based on the hydrology and topography is more likely to be surface water dependent. The habitat areas north of N197 and beneath the access track are all located close to the Kintradwell Burn. Although the habitat is also within an area classified as being underlain by a moderately productivity aquifer, they are also located on a steep hillslope where higher levels of runoff would be expected. The stream network doesn't indicate drainage pathways but based on the topography and proximity to the watercourse the habitat is likely to be reliant upon surface water runoff rather than groundwater. The very small habitat area next to N198 and beneath the associated access track LoD lies on a steep hillslope where higher levels of runoff would be expected. It is located near to an OS mapped watercourse and the stream network shows flowpaths through the area. Furthermore, aerial imagery indicates the land had been worked with potential drainage channels in the landscape. A small section of this habitat area features 0.5 m deep peat, which is associated with being surface water fed. Despite the underlying hydrogeology being a moderately productive aquifer, due to the topography and presence of peatland in the area, the habitat is assessed as surface water fed and not a highly groundwater dependent habitat The two large, clustered areas lie at N199, west of N200 and north west of N201. Both areas are located on a steep hillslope where higher levels of runoff would be expected. The stream network shows that there are drainage pathways through both GWDTE habitats, Therefore, although the habitats are underlain by a moderately productive aquifer they are considered more reliant upon surface water. The first of the two habitat areas which lie directly beneath the access track east of N201 is located on the banks of the Kintradwell Burn, on a steep hillslope, where higher levels of runoff would be expected. The stream network indicates additional drainage pathways through the GWDTE habitat. The underlying hydrogeology is a low productivity aquifer. This suggests the habitat here is associated with surface runoff to the watercourse and not therefore groundwater dependent. The second of the two habitats which lie directly beneath the access track to the south towards the A9 road is located adjacent to the Kintradwell Burn. The stream networks show this area drains south to the North Sea on a steep hillslope where higher levels of runoff would be expected. The underlying hydrogeology is a low productivity aquifer. This suggests the habitat here is not groundwater dependent.		N186 lies 90 m from an area which includes M15 habitat and the N186 temporary tower compound area lies 115 m from the habitat. The small area which contains the M15 habitat between N187 and N188 lies within the Study Area. N187 lies 70 m from the habitat and the N187 temporary tower compound area lies 35 m from the habitat. Also, N188 lies 120 m from this small area and the N188 temporary tower compound area lies 70 m from the habitat. One small area which contains the M15 habitat lies directly beneath the temporary tower compound area associated with N197 and N197 lies 30 m from this area. The 3 remaining small areas within this location lie directly beneath the access track, within the Study Area. N198 lies 60 m from a small area which includes M15 habitat and the N198 temporary tower compound area lies 10 m from the habitat. N199 lies 90 m from the large, clustered areas which includes M15 habitat and the N199 temporary tower compound area lies 50 m from the habitat. N200 lies 190 m from the large, clustered areas and the N200 temporary tower compound area lies 150 m from the habitat. N201 lies 265 m from the large, clustered areas which includes M15 habitat and the N201 temporary tower compound area lies 210 m from the habitat. There are two large areas at the end of Section A of the M15 habitat which both lie directly beneath the access track. The nearest Tower (N201) is located 500 m from this habitat.
		Section B	• Clustered areas lie beneath the OHL, N206 and N207.	Moderate	The habitat which lies beneath N206 and N207 is located within a forestry plantation asound the Clynemilton Burn. A flowpath is marked draining down from N207	All habitats are considered to be surface	A large cluster of areas lie directly beneath the OHL and N206 and N207.

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			• Clustered areas lie beneath the access track to N206. • Small areas between N211 and N212 and between N212 and N213 which lie directly beneath the OHL. • Clustered areas directly beneath or close to N215 - N219. • Large area directly beneath the access track north of N244. • Small area between N258 and N259. • One small area beneath the OHL and N267. • Area north of N288 and N289.		through the habitat, and the aerial imagery shows a number of forestry lines crossing the habitat which would encourage the accumulation and flow of surface water. The underlying hydrogeology is a low productivity aquifer, and the topography is generally steep. This suggests the habitat here is unlikely to be groundwater dependent. The habitat which lies beneath the access track south of N206 and N207 is located on a steep hillslope where higher levels of runoff would be expected. The stream network indicates additional drainage pathways through the habitat, draining to the Clynemilton Burn. The underlying hydrogeology is a low productivity aquifer. This suggests the habitat here is associated with surface water runoff to the watercourse. The watercourses and stream network show that the GWDTE habitat between N211 and N212 lies adjacent to an unnamed watercourses which drains to the An Dubh-lochan. Combined with the underlying hydrogeology being a low productivity aquifer it is considered that this habitat is likely to be surface water fed. The habitat between N212 and N213 lies in a flat area with no mapped watercourses or stream network. The TWI indicates low surface water accumulation and it is on the plateau above An Dubh-lochan. The area is underlain by a low productivity aquifer. Based on the lack of surface water features a dependency on groundwater dependency cannot be ruled out, and it remains a moderate GWDTE habitat. The watercourses and stream network show that there are drainage pathways through the GWDTE habitats between N215 and N216 which form the headwaters of the Allt nam Ban. They are located on a hillslope where higher levels of runoff would be expected. Although the habitat is within an area underlain by a moderately productivity aquifer, the topography and hydrology indicates the habitat is not groundwater dependent, but reliant on surface water runoff. The GWDTE habitat around and/or crossing N217 - N219, although underlain by a moderate productivity aquifer, is crossed by watercourses and streams, and the habitats are located on steep hillslopes where higher levels of runoff would be expected. This therefore suggests the habitat is reliant upon rainfall runoff and not groundwater. Although the habitat beneath the access track to N244 is within an area classified as being underlain by a moderate productivity aquifer, the watercourses and stream network show that there are drainage pathways through the GWDTE habitat. The habitat is located on a steep hillslope where higher levels of runoff would be expected. This suggests the habitat is reliant upon surface water. The GWDTE habitat between N258 and N259 is located on a gently sloping hillside where surface water is likely to flow through. The northern end of the habitat is along	water dependent / have a low groundwater dependency with the exception of: • the habitat between N212 and N213.	A large cluster of areas lie directly beneath the access track to N206. N211 lies 105 m from the habitat area between N211 and N212 and the N211 temporary tower compound area lies 70 m from the habitat. This habitat area also lies 200 m from N212 and 180 m from N212 temporary tower compound area. N212 lies 80 m from the GWDTE habitat area, with a potential moderate GWDTE dependency, between N212 and N213 and the N212 temporary tower compound area lies 60 m from the habitat. This habitat area also lies 90 m from N213 and 60 m from N213 temporary tower compound area. A large area lies directly beneath the OHL next to N215. N215 lies 50 m from this area and its' associated temporary tower compound area lies directly on the edge of this habitat. A large area lies directly beneath the OHL. N216 lies 60 m from this area and its' associated temporary tower compound area crosses this habitat. A large area lies directly beneath the OHL west of N217 and directly beneath N218 and N219 temporary tower compound area. N217 lies 100 m from this habitat and the N217 temporary tower compound area lies 70 m from the habitat. N218 lies 20 m from this habitat. N219 lies 30 m from this habitat. The habitat lies directly beneath the access track north of N244. N258 lies 110 m from this habitat and the N258 temporary tower compound area lies 70 m from the habitat.

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					the banks of an unnamed watercourse which drains into the Morvich Burn. The TWI indicates moderate areas of flow accumulation within the habitat area. The habitat is also within an area classified as being underlain by a low productivity aquifer. Therefore, the habitat is not considered groundwater dependent. The GWDTE habitat beneath N267 is located on a very steep hillslope where higher levels of runoff would be expected. The stream network shows flowpaths emerging from the habitat. Although underlain by a moderately productivity aquifer the topography and hydrology indicates the habitat is surface water dependent. The TWI show the land is saturated in the GWDTE habitat near N288 and N289. There mapped stream network also shows flowpaths through the habitat. The area is located on a hillslope where higher levels of runoff would be expected. The habitat is also within an area classified as being underlain by a low productivity aquifer. This suggests the habitat is reliant upon surface water runoff, not groundwater.		This habitat lies directly beneath the OHL at N259. N259 lies 90 m from this habitat and the N259 temporary tower compound area lies 70 m from the habitat. This habitat lies directly beneath the OHL and N267 and its' associated temporary tower compound area. N288 lies 125 m from this habitat area and the N288 temporary tower compound area lies 90 m from the habitat. N289 lies 110 m from this habitat area and the N289 temporary tower compound area lies 80 m from the habitat.
		Section C	• Small area between S1 and S2. • Small clustered areas north of S7 - S10. • Area beneath S13. • Large areas beneath S16 and S17. • Area between S19 and S20. • Area between S21 and S22.	Moderate	The TWI dataset indicates high levels of ground moisture in the GWDTE habitat between S1 and S2. There are also flowpaths running through the habitat and it is located on a forested hillslope with drainage channels likely to be present due to the forestry. The habitat is also within an area underlain by a low productivity aquifer. This suggests the habitat is not groundwater dependent. The GWDTE habitat north of S7 - S10 is located on steep terrain where higher levels of runoff would be expected. The stream network indicates flow through the habitat and it is underlain by a low productivity aquifer suggesting it's not a groundwater dependent habitat The habitat beneath S13 is located on and at the base of a steep hillslope where higher levels of runoff would be expected. In addition, it sits adjacent to Loch Leisgein a point of surface water accumulation. The habitat is also within an area classified as being underlain by a low productivity aquifer. Based on the hydrology and hydrogeology the habitat is not considered groundwater dependent. The habitat beneath S16 and S17 is located on the banks of the Allt na Ciste Duibhe and the stream network shows several drainage pathways through the habitat. The underlying hydrogeology is low productivity aquifer, and the habitat is located in an area where there have been land use modifications that will have altered drainage pathways. Thus, the habitat is likely to be supported by surface water runoff. The habitat areas near to S19 - S20 are all located near an unnamed tributary and the stream network indicates drainage pathways through the habitat. The underlying hydrogeology is low productivity aquifer, and the area is located on a steep hillside where higher levels of runoff would be expected. It is also within an area of forestry where drainage channels will have been constructed again leading to an	All habitats are considered to be surface water dependent / have a low groundwater dependency.	S1 lies 120 m from the GWDTE and the S1 temporary tower compound area lies 75 m from the habitat. S2 lies 70 m from the GWDTE habitat and the S2 temporary tower compound area lies 40 m from the habitat. S7 lies 100 m from the GWDTE habitat and the S7 temporary tower compound area lies 50 m from the habitat. S8 lies 200 m from the GWDTE habitat and the S8 temporary tower compound area lies 170 m from the habitat. S9 lies 130 m from the GWDTE habitat and the S9 temporary tower compound area lies 90 m from the habitat. S10 lies 200 m from the GWDTE habitat and the S10 temporary tower compound area lies 130 m from the habitat. GWDTE habitat is directly beneath S13. GWDTE habitat is directly beneath S16 and S17.

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					accumulation and transport of surface water. This suggests the habitat is not moderately groundwater dependent, but instead reliant upon surface water runoff. The habitat areas near to S21 and S22 are all located near an unnamed tributary of Henman's Burn and the stream network indicates drainage pathways through the habitat. The underlying hydrogeology is low productivity aquifer, and the area is located on a steep hillside where higher levels of runoff would be expected. This suggests the habitat is not moderately groundwater dependent, but instead reliant upon surface water runoff.		S19 lies 35 m from the GWDTE habitat located between S19 and S20 and the S19 temporary tower compound area lies on the edge of this habitat. Also, this habitat area lies 150 m from S20 and 125 m from S20 temporary tower compound area. S21 lies 65 m from the GWDTE habitat between S21 and S22 and the S21 temporary tower compound area lies 25 m from the habitat. This habitat also lies 170 m from S22 and 165 m from the S22 temporary tower compound area.
		Section D	• Area beneath S89. • Large clustered areas between S94 – S98. • Cluster between S98 and S99. • Beneath S129 and south of S129 – S131. • Large clustered areas between S133 – S137.	Moderate	The habitat beneath S89 is located on the hillslopes above the River Averon and along the unnamed tributaries flowing into the River Averon. In addition, the stream network indicates several additional drainage pathways through the habitat. The underlying hydrogeology is also a low productivity aquifer. The hydrological setting therefore suggests the habitat is reliant upon surface water runoff. The habitat beneath S94 – S98 is located along a steep hillside where higher levels of runoff would be expected. This is reflected in the stream network which shows several drainage pathways flowing through the habitat. The underlying hydrogeology is a low productivity aquifer. This suggests the habitat is reliant upon surface water inputs, not groundwater. The habitat between S98 and S99 is on a hillside where higher levels of runoff would be expected. This is reflected in the stream network which shows several drainage pathways flowing through the habitat. The underlying hydrogeology is a low productivity aquifer. This suggests the habitat is reliant upon surface water inputs, not groundwater. The habitats beneath S129, and between S129 and S131 are located on steep hillsides where higher levels of runoff would be expected. This is reflected in the OS watercourses and stream network which shows surface water runoff pathways through the habitat which flow towards the Strath Sgitheach. The habitat is underlain by a medium productivity aquifer, but the surface water hydrology indicates the habitat is more likely surface water dependent. The habitat between S133 and S137 is also located on steep hillsides where higher levels of runoff would be expected. The OS watercourses and stream network show several drainage pathways through the GWDTE habitats. Although underlain by a moderately productivity aquifer the high level of surface water in the area indicated a low level of groundwater dependency.	All habitats are considered to be surface water dependent / have a low groundwater dependency.	Large area lies directly beneath the OHL and S89. Large clustered areas lie directly beneath the OHL and S94 – S98. S98 lies 115 m from the clustered GWDTE habitat between S98 and S99 and the S98 temporary tower compound area lies 105 m from the habitat. Also, this cluster of habitats lies 30 m from S99 and lies directly beneath S99 temporary tower compound area. S129 is 10 m from the GWDTE habitat and lies directly beneath the S129 temporary tower compound area. Also, S130 lies 80 m from this habitat area and 30 m from the S130 temporary tower compound area. S131 lies 170 m from this habitat area and 140 m from the S131 temporary tower compound area. Large, clusters of the GWDTE habitat lie directly beneath the OHL and S133 - S137.

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M25	*Molinia caerulea - Potentilla erecta mire*	Section A	• Area within the Study Area, near to N98 and N99. • Small scattered areas west of N176 and N177 and beneath the access track to N177.	Moderate	The watercourses and stream network show that there are drainage pathways through the GWDTE habitat at N98 and N99. The habitat is located on a hillslope where higher levels of runoff would be expected. The habitat is also within an area classified as being underlain by a low productivity aquifer. This suggests the habitat is reliant upon surface water runoff. The watercourses and stream network show that there are drainage pathways through the GWDTE habitat beneath the access track to N177 and west of N176 and N177, associated with the nearby Loth Burn. It is located on a steep hillslope where higher levels of runoff would be expected. The habitat is also within an area classified as being underlain by a low productivity aquifer. Peat is featured in this habitat up to 0.25 m deep, which is associated with being surface water fed This suggests the habitat is reliant upon surface water flow.	All habitats are considered to be surface water dependent / have a low groundwater dependency.	N99 lies 55 m from the GWDTE habitat and the N99 temporary tower compound area lies 5 m from the habitat. N98 lies 240 m from the GWDTE habitat located next to N99 and the N98 temporary tower compound area lies 180 m from the habitat. Scattered areas of the GWDTE habitat lies directly beneath the access track to N177. N176 lies 115 m from this habitat and the N176 temporary tower compound area lies 70 m from the habitat. N177 lies 210 m from the habitat and the N177 temporary tower compound area lies 170 m from the habitat.
		Section B	• Small areas between N265 and N266. • Small area north of N278. • Small area west of N288.	Moderate	The habitat between N265 and N266 is located on the banks of the River Fleet and beneath unnamed tributaries of the River Fleet, and the stream network indicates additional drainage pathways through the habitat. The underlying hydrogeology is low productivity aquifer, and the area is located on flat land on the floodplain of the watercourse. This suggests the habitat is not groundwater dependent. The habitat north of N278 is located on the banks, and within the floodplain of the Strath Carnaig and two unnamed tributaries of the Strath Carnaig. In addition, the stream network shows drainage pathways through the habitat. The underlying hydrogeology is low productivity aquifer. This hydrogeological setting suggests the habitat is surface water dependent. The OS watercourses and stream network show that there are drainage pathways through the GWDTE habitat beneath the OHL next to N288. The habitat is located on a steep hillslope where higher levels of runoff would be expected. In addition, the habitat is within an area classified as being underlain by a low productivity aquifer. This suggests the habitat is surface water fed.	All habitats are considered to be surface water dependent / have a low groundwater dependency.	N265 lies 130 m from the habitat and the N265 temporary tower compound area lies 70 m from the habitat. N266 lies 50 m from the habitat and the N266 temporary tower compound area lies 5 m from the habitat. N278 lies 150 m from the habitat and the N278 temporary tower compound area lies 110 m from the habitat. The habitat area east of N288 lies within the Study Area. The N288 temporary tower compound area lies on the edge of the habitat area and N288 lies 35 m from the habitat.
		Section C	• Small area north of S7 and S8. • Small area northeast of S13. • Small area east of S14. • Small clustered area between S15 and S16.	Moderate	The watercourses and stream network show that there are drainage pathways through the GWDTE habitat north of S7 and S8 which flow into the Allt Loch Leisgein watercourse. The habitat is located on a hillslope where higher levels of runoff would be expected. The habitat is also within an area classified as being underlain by a low productivity aquifer. This suggests the habitat is not groundwater dependent.	All habitats are considered to be surface water dependent / have a low groundwater dependency.	S7 lies 100 m from the habitat north of S7 and S8 and the S7 temporary tower compound area lies 50 m from the habitat. Also, S8 lies 140 m from this habitat area and the S8 temporary tower compound area lies 100 m from the habitat.

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					The watercourses and stream network show that there are drainage pathways through the GWDTE habitat between S13 and S14 associated with Loch Leisgein. The habitat is located on the hillslope above Loch Leisgein, an area of surface water accumulation, and the hillslopes are where higher levels of runoff would be expected. The habitat is also within an area classified as being underlain by a low productivity aquifer. This suggests the habitat is surface water dependent. The habitat between S15 and S16 is located along the banks and floodplain of the Allt na Ciste Duibhe watercourse. The stream network indicates additional drainage pathways through the habitat. The underlying hydrogeology is low productivity aquifer. Therefore, the habitat is likely to have a low groundwater dependency.		S13 lies 140 m from the habitat and the S13 temporary tower compound area lies 70 m from the habitat. S14 lies 50 m from the habitat and the S14 temporary tower compound area lies 10 m from the habitat. S15 lies 15 m from the habitat and the habitat lies directly beneath the S15 temporary tower compound area. S16 lies 110 m from the habitat and the S16 temporary tower compound area lies 95 m from the habitat.
		Section D	Two small areas north of S89.	Moderate	The habitat north of S89 is located along the banks of and within the floodplain of the River Carron. The stream network also shows drainage pathways through the habitat. The underlying hydrogeology is low productivity aquifer. Based on this the habitat is likely surface water dependent.	All habitats are considered to be surface water dependent / have a low groundwater dependency.	S89 lies 120 m from the habitat and the S89 temporary tower compound area lies 90 m from the habitat.
		Section E	• Small area between S160 and S161. • Small clustered area between S184 and S185. • Small area between S191 and S192.	Moderate	The habitat between S160 and S161 is located along the banks of a watercourse flowing into Loch na Crann. The stream network also shows drainage pathways through the habitat. The underlying hydrogeology is low productivity aquifer. Based on this the habitat is likely surface water dependent. The watercourses and stream network show that there are drainage pathways through the GWDTE habitat between S184 and S185. The habitat is located on a very steep hillslope where higher levels of runoff would be expected. It is also within an area of forestry where drainage channels are likely to have been constructed providing area for surface water to accumulate and flow through the area. The habitat is also within an area underlain by a low productivity aquifer. Based on this the habitat is likely to have a low groundwater dependency. The habitat between S191 and S192 is located along the banks of an unnamed tributary to the River Orrin. There is also a flowpath through the habitat. The underlying hydrogeology is low productivity aquifer, and the habitat is located at the bottom of a steep hillslope and in an area of forestry where runoff drainage channels have likely been constructed. This suggests the habitat is surface water fed.	All habitats are considered to be surface water dependent / have a low groundwater dependency.	S160 lies 70 m from the habitat and the S160 temporary tower compound area lies 10 m from the habitat. S161 lies 115 m from the habitat and the S161 temporary tower compound area lies 75 m from the habitat. S184 lies 105 m from the habitat and the S184 temporary tower compound area lies 45 m from the habitat. S185 lies 150 m from the habitat and the S185 temporary tower compound area lies 130 m from the habitat. S191 lies 50 m from the habitat and the S191 temporary tower compound area lies 30 m from the habitat.

NVC Code	NVC Community	Section	GWDTE Location	Potential Groundwater Dependency based on NVC Code	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
							S192 lies 170 m from the habitat and the S192 temporary tower compound area lies 110 m from the habitat.
M26	*Molinia caerulea - Crepis paludosa mire*	Section A	Three small areas beneath the access track west of N178.	Moderate	Although the habitat beneath the access track west of N178 is within an area classified as being underlain by a moderately productivity aquifer, the watercourses and stream network show that there are drainage pathways through the habitat. The habitats are located at the base of a steep hillslope where runoff would be expected to accumulate. This suggests the habitat is reliant upon surface water not groundwater.	Habitat is considered to be surface water dependent / have a low groundwater dependency.	The habitat lies directly beneath the access track west of N178. N178 lies 400 m from this habitat.
M27	*Filipendula ulmaria - Angelica sylvestris mire*	Section B	Very small area west of N264.	Moderate	The habitat is located on the banks of the River Fleet within the floodplain and where the topography is flat. The habitat is also underlain by a low productivity aquifer. Based on this it is likely surface water supports the habitat.	Habitat is considered to be surface water dependent / have a low groundwater dependency.	N264 lies 260 m from the habitat. The N264 temporary tower compound area lies 220 m from the habitat.
MG10	*Holcus lanatus - Juncus effusus rush-pasture*	Section A	• Large area beneath N2. • Small area west of N34 and N35. • Small area beneath the access track to the west of N71. • Very small area northeast of N84. • Area beneath access track to the west of N96. • Large area beneath N100.	Moderate	The GWDTE habitat which lies beneath N2 is located on the banks of the Burn of Halkirk and its associated drainage network. The TWI mapping indicates high ground moisture levels. The habitat is also located at the base of a hillslope. Although the underlying hydrogeology is a moderately productive aquifer the habitat based on the hydrological setting is likely has a low groundwater dependency. The watercourses and stream network show that there are drainage pathways through the GWDTE habitat to the west of N34 and N35 which drain towards the Little River. The habitat is located on a gently sloping hillside. The OS mapping shows the marsh symbology in the vicinity of the habitat which would indicate areas of high water accumulation. Although the habitat is within an area underlain by a moderately productive aquifer, the surface water hydrology indicates a low groundwater dependency. The GWDTE habitat beneath the access track to N71 is located on a hillside where higher levels of runoff would be expected. A flowpath is located north and south of the habitat. The TWI dataset indicates areas of higher wetness within the habitat. The area is underlain by a moderately productive aquifer, but the surface water hydrology datasets indicated there is not a high groundwater dependency. The GWDTE habitat which lies northeast of N84 on the banks of the Dunbeath Water and at the base of a steep hillslope where high levels of surface water runoff would be expected. The underlying hydrogeology is a moderately productive aquifer but the topography and proximity to the Dunbeath Water floodplain suggests the habitat is surface water dependent. The stream network dataset shows there is surface water flow through the GWDTE habitat beneath the access track to N96. In addition, it is located on a hillslope leading towards the Allt na Buaidhe. The habitat is underlain by a moderately	All habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies beneath the OHL and N2. GWDTE lies 300 m from both N34 and N35. The habitat lies directly beneath the access track to N71. N71 lies 150 m from the habitat and the N71 temporary tower compound area lies 100 m from the habitat. N84 lies 75 m from the habitat and the N84 temporary tower compound area lies 35 m from the habitat. The habitat lies directly beneath the access track to N96. N96 lies 270 m from the habitat. The N96 temporary tower compound area lies 235 m from the habitat. The habitat lies directly beneath N100, within the Study Area.

NVC Code	NVC Community	Section	GWDTE Location	Potential Groundwater Dependency based on NVC Code	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
					productive aquifer, but the proximity to surface water sources suggest a low groundwater dependency. The GWDTE habitat to the east of N100, although underlain by a moderately productive aquifer, is located on a hillslope where higher levels of runoff would be expected. This is reflected by the numerous flowpaths shown running through the habitat. Based on this the habitat is likely surface water dependent.		
		Section B	Small clusters around N290.	Moderate	The stream network shows drainage pathways through the GWDTE habitat beside N290. The habitats are located on a forested hillslope where higher levels of runoff would be expected. In addition, the habitat is underlain by a low productivity aquifer. Therefore, this habitat is considered to have low to no groundwater dependency.	All habitats are considered to be surface water dependent / have a low groundwater dependency.	N290 lies 60 m from the habitat and the N290 temporary tower compound area lies 20 m from the habitat, within the Study Area.
		Section D	• Five small areas around S38. • Very long thin clustered area which runs east of S68 – S71.	Moderate	The habitats at S38 are located in the floodplain of the River Carron, and there are several flowpaths through the GWDTE habitat. The habitat is underlain by a low productivity aquifer. The habitat is therefore unlikely to be groundwater dependent. The GWDTE habitat which lies east of S68 – S71 is located along the banks of an unnamed tributary to the Abhainn Glac an t-Seilich watercourse. It is located within the base of a valley where runoff from the hillslopes will accumulate. The area is underlain by a low productivity aquifer. Based on this the habitat is likely surface water fed.	All habitats are considered to be surface water dependent / have a low groundwater dependency.	S38 lies 40 m from the habitat and the S38 temporary tower compound area lies 15 m from the habitat. S68 lies 140 m from the habitat and the S68 temporary tower compound area lies 110 m from the habitat. S69 lies 90 m from the habitat and the S69 temporary tower compound area lies 60 m from the habitat. S70 lies 20 m from the habitat and the S70 temporary tower compound area lies 10 m from the habitat. S71 lies 140 m from the habitat and the S71 temporary tower compound area lies 110 m from the habitat.
		Section E	One large area beneath S203.	Moderate	The GWDTE habitat beneath S203 is located on a hillslope where higher levels of runoff would be expected. The stream network shows runoff pathways originating in the habitat. The habitat is underlain by a low productivity aquifer. Therefore, this habitat is therefore likely to have a low groundwater dependency.	The habitat is considered to be surface water dependent / have a low groundwater dependency.	The habitat lies directly beneath the OHL and S203.
MG8	*Cynosurus cristatus - Caltha palustris lowland neutral grassland*	Section C	One small area north of S2.	Moderate	The habitat is in a low lying area at the base of a forested hillslope. The watercourses and stream network do not show surface water flow paths through the habitat. However, the TWI indicates areas of high wetness. There are recorded peat depths of up to 2 m in this area, a habitat that is associated with being surface water fed. The underlying hydrogeology is a low productivity aquifer. Therefore, due to the high wetness, the presence of peat and a low aquifer productivity, this habitat has been assessed as surface water fed and not groundwater dependent.	The habitat is considered to be surface water dependent / have a low groundwater dependency.	S2 lies 175 m from the habitat and the S2 temporary tower compound area lies 130 m from the habitat.

NVC Code	NVC Community	Section	GWDTE Location	Potential Groundwater Dependency based on NVC Code	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
MG9	*Holcus lanatus - Deschampsia cespitosa grassland*	Section A	• Small area between N6 and N7. • Large area northwest of N63 and N64.	Moderate	Although the GWDTE habitat between N6 and N7 is underlain by a moderately productive aquifer. The stream network shows a flowpath through the habitat and there is a high TWI. The habitat is located towards the base of a hillslope where higher levels of runoff and accumulation would be expected. Therefore, the habitat is likely more surface water dependent then groundwater dependent. The GWDTE habitat northwest of N63 and N64 is located along a hillslope where higher levels of runoff would be expected. The western extent of the habitat is along the banks of an unnamed watercourse, and the eastern extent of the habitat by a flowpath shown in the stream network. The habitat is underlain by a moderately productive aquifer but the topography and hydrology in the area suggests a low groundwater dependency.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	N6 lies 165 m from the habitat and the N6 temporary tower compound area lies 135 m from the habitat. N7 lies 60 m from the habitat and the N7 temporary tower compound area lies 5 m from the habitat. N63 lies 110 m from the habitat and the N63 temporary tower compound area lies 70 m from the habitat. N64 lies 185 m from the habitat and the N64 temporary tower compound area lies 130 m from the habitat.
		Section B	Clustered areas between N264 and N265.	Moderate	The GWDTE habitat which lies between N264 and N265 is located on the banks / within the floodplain of the River Fleet. There are also numerous surface water flowpaths through the habitat. The underlying hydrogeology is a low productivity aquifer. Based on this the habitat is not moderately groundwater dependent.	The habitat is considered to be surface water dependent / have a low groundwater dependency.	N264 lies 75 m from the habitat and the N264 temporary tower compound area lies 30 m from the habitat. N265 lies 40 m from the habitat and the habitat lies directly beneath the N265 temporary tower compound area.
		Section D	• Small areas around S38. • One small area to the east of S137.	Moderate	The GWDTE habitats around S38 is located in the floodplain of the River Carron and is underlain by a low productivity aquifer. The stream network shows surface water flowpaths through the habitat. The habitat is therefore likely surface water dependent. The GWDTE habitat to the east of S137 is underlain by a moderately productive aquifer, but the habitat is located on a steep hillslope where higher levels of runoff would be expected. It lies directly along an unnamed watercourse and in an area where there are numerous surface water flowpaths. This suggests the habitat is surface water fed.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	S38 lies 40 m from the habitat and the S38 temporary tower compound area lies 15 m from the habitat. S137 lies 45 m from the habitat and the S137 temporary tower compound area lies 10 m from the habitat.
S27	*Carex rostrata - Potentilla palustris tall-herb fen*	Section A	One very small area north of N27.	Moderate	The habitat near N27 is underlain by a medium productivity aquifer. However, it is located along the banks of a watercourse and the stream network shows surface water flow through the GWDTE habitat. In addition, the habitat is located in a low lying area where the TWI indicates surface water pooling along the watercourse. This suggests the habitat is reliant upon surface water and is not groundwater dependent.	This habitat is considered to be surface water dependent / have a low groundwater dependency.	N27 lies 225 m from the habitat and the N27 temporary tower compound area lies 185 m from the habitat. It also lies 45 m south of the access track to the west of N27.
U6	*Juncus squarrosus - Festuca ovina grassland*	Section A	• Small area next to N1. • Areas beneath N43 and N44. • Clusters between N175 and N176.	Moderate	The TWI show areas of moderate wetness through the GWDTE habitat at N1. The habitat is also within an area classified as being underlain by a low productivity aquifer. The terrain is flat but many flowpaths originate from the wider area around N1 and N2 which suggests surface water is present and is likely to support the habitat with low levels of groundwater dependency.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies beneath the N1 temporary tower compound area and 35 m from N1. The habitat lies beneath N43 and N44.

NVC Code	NVC Community	Section	GWDTE Location	Potential Groundwater Dependency based on NVC Code	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
					Although underlain by a moderately productivity aquifer, the TWI dataset shows areas of high wetness within the GWDTE habitat beneath N43 and N44. The habitat is also located on a hillslope where higher levels of runoff would be expected. This suggests the habitat is likely to be more surface water fed than groundwater dependent. The watercourses and stream network show that the GWDTE habitat between N175 and N176 lies directly along drainage pathways to the Loth Burn. The habitat is also underlain by a low productivity aquifer. The habitat is located on very steep terrain where higher levels of runoff would be expected. Therefore the habitat is considered surface water fed.		N175 lies 95 m from the habitat and the N175 temporary tower compound area lies 55 m from the habitat. N176 lies 95 m from the habitat and the N176 temporary tower compound area lies 45 m from the habitat.
		Section D	• Area east of S40. • Small clustered areas around S44 and S46.	Moderate	The GWDTE habitat next to S40 is located on a steep hillslope where higher levels of runoff would be expected. This is reflected in the watercourses and stream network which shows flowpaths through the habitat which discharge into the River Carron. In addition, the habitat is underlain by a low productivity aquifer. Therefore, the habitat is not considered groundwater dependent. The GWDTE habitat around S44 and S46 is located on very steep terrain where higher levels of runoff would be expected. This is shown in the stream network with multiple flowpaths flowing through the habitat. The habitat is underlain by a low productivity aquifer. Based on the topography and hydrology the habitat is not considered groundwater dependent.	The habitat is considered to be surface water dependent / have a low groundwater dependency.	S40 lies 80 m from the habitat and the S40 temporary tower compound area lies 55 m from the habitat. The habitat between around S44 and S46 lies beneath the OHL. S44 lies 115 m from the habitat and the S44 temporary tower compound area lies 75 m from the habitat. S46 lies 85 m from the habitat and the S46 temporary tower compound area lies 45 m from the habitat.
W3	*Salix pentandra - Carex rostrata woodland*	Section B	One very small area east of N264.	Moderate	The watercourses and stream network show that the GWDTE habitat east of N264 lies in a low-lying area along the banks of two watercourses, and the habitat is underlain by a low productivity aquifer. This suggests the habitat is reliant upon surface water and is considered not groundwater dependent.	The habitat is considered to be surface water dependent / have a low groundwater dependency.	410 m from N264.
W5	*Alnus glutinosa - Carex paniculata woodland*	Section E	One very small area west of S177.	Moderate	The habitat west of S177 is underlain by a moderately productive aquifer but is located on the banks of the River Conon within its floodplain which indicates a great reliance on surface water from the river than the underlying groundwater.	The habitat is considered to be surface water dependent / have a low groundwater dependency.	S177 lies 380 m from this habitat.
W6	*Alnus glutinosa - Urtica dioica woodland*	Section E	One very small area west of S177.	Moderate	The habitat area west of S177 is underlain by a moderately productive aquifer but is located on the banks of the River Conon and within its floodplain which indicates a great reliance on surface water from the river than the underlying groundwater.	The habitat is considered to be surface water dependent / have a low groundwater dependency.	S177 lies 380 m from this habitat.

Table 3: High GWDTE Habitat Assessment

NVC Code	NVC Community	Section	Potential GWDTE Location	Potential Groundwater Dependency based on NVC Class	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
M10	*Carex dioica - Pinguicula vulgaris mire*	Section B	Three habitats south of N218 - N220	High	The habitats between N218-N220 are located on a hillslope that features multiple surface water flow paths and watercourses which flow into Loch Brora. Although the underlying hydrogeology is a moderately productive aquifer, as the topography is steep higher levels of runoff would be expected as shown by the presence of flow paths. This suggests that the habitat is reliant on surface water.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 110 m southeast of N220 and the N220 temporary tower compound area lies 50 m from the habitat. The habitat lies 120 m southwest from N218 and N218 temporary tower compound area lies 70 m from the habitat. The habitat lies directly beneath the associated permanent access track.
		Section D	Cluster east of S44 and permanent access track that connects to S43	High	The habitats are located along the banks of Allt Dounie, are on a moderate hillslope where surface water runoff would be anticipated to be higher, and the stream network shows flow paths through the habitat. The habitat is also underlain by a low productivity aquifer. Therefore, the habitats are considered to have a low dependency on groundwater and instead be surface water fed.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 480 m east of S44 and 290 m east of permanent access track that connects to S43.
M16	*Erica tetralix - Sphagnum compactum wet heath*	Section A	• Cluster of habitat beneath N1 and N2. • Large area of habitat beneath N145 - N147. • Large area of habitat directly beneath N147 – N148.	High	Although the underlying hydrogeology of the habitats that lie beneath N1 and N2 is a moderately productive aquifer, the habitats are in a low lying topographic area with moderate TWI. Surface water flowpaths flow through the habitat and peat is featured in this habitat up to 2.7 m deep, which is associated with being surface water fed therefore this suggests that the habitats are not highly groundwater dependent. The habitat beneath N145-N147 is located on a steep hillslope with a moderate – high TWI. There are multiple surface water flow paths associated with the habitat flow into the Caen Burn and the River Helmsdale. Peat is featured in this habitat up to 1.25 m deep, which is associated with being surface water fed. The underlying hydrogeology is a low productivity aquifer. Therefore, due to its association with surface water flow paths, steep topography, presence of peat and a low aquifer productivity, this habitat has been assessed as surface water fed and not groundwater dependent. The habitat that lies beneath N147 and N148 is located on a steep hillslope with a moderate – high TWI. There are multiple surface water flow paths associated with the habitat flow into the Caen Burn and the River Helmsdale. Peat is featured in this habitat up to 1.25 m deep, which is associated with being surface water fed. The underlying hydrogeology is a low productivity aquifer. Therefore, due to its association with surface water flow paths, steep topography, presence of peat and a low aquifer productivity, this habitat has been assessed as surface water fed and not groundwater dependent.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies directly beneath N1 and N2 along with permanent access tracks that connect to N1 and N2. The habitat lies directly beneath N145, N146 and N147. The habitat lies directly beneath N147 and N148 along with permanent and temporary access tracks that connect to these towers.

NVC Code	NVC Community	Section	Potential GWDTE Location	Potential Groundwater Dependency based on NVC Class	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
		Section C	Large area of habitat beneath S2 and permanent access track that connects to S2.	High	These habitats are within a relatively low-lying area with a low TWI. It lies within the drainage network of the Allt Garbh-airigh watercourse. Several flowpaths run through the habitats. Peat is featured in this habitat up to 2.7 m deep, which is associated with being surface water fed. The underlying hydrogeology is a low productivity aquifer. Therefore, due to its association with surface water flow paths and low productivity aquifer, and areas of deep peat, this habitat has been assessed as surface water fed and not groundwater dependent.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies directly beneath S2 and permanent access track that connects to S2.
		Section D	• Small area east of S38 • Small area west of S38	High	Habitat to the east of S38 is in a relatively low-lying area and has a moderate TWI. A surface water flow path travels through the habitat toward the River Carron to the south. The underlying hydrogeology is a low productivity aquifer. Therefore, due to its association with surface water flow paths and low productivity aquifer, this habitat has been assessed as surface water fed and not groundwater dependent. Habitat to the west of S38 is within a moderate hillslope where moderate levels of surface water runoff would be expected. The habitat is associated with a nearby surface water flow path that is a tributary of the River Carron. The underlying hydrogeology is a low productivity aquifer. Therefore, due to its association with surface water flow paths and low productivity aquifer, this habitat has been assessed as surface water fed and not groundwater dependent.	The habitat is considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 210 m east of S38 and S38 temporary tower compound area lies 180 m from the habitat. Another habitat area lies 310 m west of S38 and the S38 temporary tower compound area lies 280 m from this habitat.
		Section E	Large area west of S189	High	Habitat to the west of S189 is on a steep hillslope where high levels of surface water runoff would be expected. This habitat is not associated with mapped surface water flow paths and the underlying hydrogeology is a moderately productive aquifer. The TWI indicated areas of high wetness on the fringes of the habitat but lower in the centre. Due to the lack of surface water flow paths, low TWI nearer the centre of the habitat, and moderately productive aquifer, it is not possible to completely rule out groundwater dependency. However, due to the topography and high TWI on the fringes of the habitat it is assessed as being moderately rather than highly groundwater dependent.	Moderate	The habitat lies 50 m west of S189 and the S189 temporary tower compound area lies 25 m from the habitat.
M21	*Narthecium ossifragum - Sphagnum papillosum valley mire*	Section A	One small area west N188.	High	Habitat to the west of N188 is on a steep hillslope, has a surface water flow path that travels through it, and is located along the banks of the Sletdale Burn. This habitat is also within an area of peatland, which is associated with being surface water fed. The underlying hydrogeology is a moderately productive aquifer but due to its association with nearby surface water features, its association with peatland and being at the base of a steep hillslope, the habitat has	The habitat is considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 270 m east of N188 and the N188 temporary tower compound area lies 200 m from the habitat.

NVC Code	NVC Community	Section	Potential GWDTE Location	Potential Groundwater Dependency based on NVC Class	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
					been assessed as surface water fed and not groundwater dependent.		
		Section D	Large area northeast of S44 and northeast of permanent access track that connects to S43	High	Habitat northeast of S44 is on a moderate hillslope where surface water runoff would be anticipated to be higher, and the stream network shows flow paths 70 m south of the habitat. The habitat is also underlain by a low productivity aquifer. Therefore, the habitats are considered to have a low dependency on groundwater and instead be surface water fed.	The habitat is considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 170 m northeast of the permanent access track that connects to S43 and 340 m northeast of S44. The S44 temporary tower compound area lies 300 m from the habitat.
M23	*Juncus effusus/acutiflorus - Galium palustre rush-pasture*	Section A	• Small area west of N25 • Cluster of the habitat lies south of N35 and directly beneath N36 and the permanent access track that connects to N35. • Small area of habitat beneath N39. • Small area southeast of N57 and permanent access track that connects to N57. • Large area west of N97. • Large area east of N181 • A large area of habitat beneath N189.	High	Habitat that is situated west of N25 is in a low-lying area located along the banks of and within the floodplain of the Allt Caol. The underlying hydrogeology is a moderately productive aquifer. The OS mapping shows marsh / reeds in the area suggesting an area of surface water accumulation. Due to the proximity to a named watercourse the habitat has been assessed as surface water fed and not highly groundwater dependent. The habitat that clusters around N35 and N36 is situated with a low-lying area that is associated with a marshland. It also within an area of moderate TWI. The habitat is located along the banks of the Burn of Tacher and the watercourse flows directly through it. This habitat features 0.8 m deep peat, which is associated with being surface water fed. Despite the underlying hydrogeology being a moderately productive aquifer due to the location of the habitat being along the banks of the Burn of Tacher and presence of marshland and peatland in the area, the habitat is assessed as surface water fed and not a highly groundwater dependent habitat. The habitat that N39 is placed on is on a gently sloping hillside and area of high TWI. A surface water flow path travels through it the area. This habitat features an area of 0.1 m deep peat, which is associated with being surface water fed. The underlying hydrogeology is a moderately productive aquifer but presence of peat and surface water hydrology features indicate the habitat is more likely to be surface water dependent. Habitat southeast of N57 is underlain by a moderately productive aquifer. However, it is at the base of a topographic spur with a high TWI, and a surface water flowpath flows through the habitat. This habitat features an area of peatland that is 2 m deep, which is associated with being surface water fed. This indicates the habitat is more likely surface water fed and not highly groundwater dependent.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	is the habitat lies 60 m west of N25 and the N25 temporary tower compound area lies 30 m from the habitat The habitat lies 80 m south of N35 and directly beneath N36 and the temporary access tracks that connect to N35. The N35 temporary tower compound area lies 30 m from the habitat. The habitat lies directly beneath N39. The habitat lies 130 m southeast of N57 and the N57 temporary tower compound area lies 100 m from the habitat. A permanent access track that connects to N57 is 30 m west of the habitat. The habitat lies 135 m west of N97 and the N97 temporary tower compound area lies 100 m from the habitat. The temporary access track that connects to N96 is 5 m northeast of the habitat. The habitat lies 90 m east of N181 and the N181 temporary tower compound area lies 50 m from the habitat. The habitat lies directly beneath N189.

NVC Code	NVC Community	Section	Potential GWDTE Location	Potential Groundwater Dependency based on NVC Class	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
					Habitat west of N97 is at the base of a gentle hillslope. The TWI is moderate. A surface water flowpath travels through the area. This habitat features an area of peat that is 0.2 m deep, which is associated with being surface water fed. Therefore, although the underlying hydrogeology is a moderately productive aquifer the habitat is not assessed as being highly groundwater dependent. Habitat east of N181 is on a steep hillslope where high levels of surface water runoff would be expected. It is also adjacent to a large tributary of the Loth Burn. The habitat features an area of peatland that is 0.2 m deep, which is associated with being surface water fed. The habitat is situated between a moderately productive and low productivity aquifer. Based on this the habitat is not considered highly groundwater dependent. The habitat that is east of N181 is on a steep hillslope and adjacent to OS mapped watercourse. In addition, the stream network shows surface water flow paths within the habitat that discharges into Loth Burn. The underlying hydrogeology is a moderately productive aquifer but the location of the habitat on a steep slope with surface water drainage running through it indicates the habitat is surface water fed and not highly groundwater dependent. The habitat N189 is placed on is on a steep hillslope and adjacent to an OS mapped watercourse. In addition, the stream network shows surface water flowpaths within the habitat that discharges into the unnamed tributary and then the Sletdale Burn. The underlying hydrogeology is a moderately productive aquifer but the location of the habitat on a steep slope with surface water drainage running through it indicates the habitat is surface water fed and not highly groundwater dependent.		
		Section B	Small area of habitat beneath N265 and south of N264 and temporary access tracks connected to N264.	High	The habitat beneath N265 and next to N264 is within the low-lying floodplain of the River Fleet. The TWI is high in this area. Flowpaths run through this habitat. The underlying hydrogeology is a low productivity aquifer. Therefore, due to the proximity to the River Fleet, surface water flowpaths, high TWI, and low productivity of the aquifer, the habitat has been assessed as surface water fed and not groundwater dependent.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies directly beneath N265 and the temporary access tracks and N264 are 20 m north of the habitat.
		Section C	• Large area of habitat beneath S2. • Large area north of S24. • Large area south of S35 and within permanent access track adjacent to S35.	High	The habitat that beneath S2 is within a relatively low-lying area which is crossed by the stream network of the Altan Dubh watercourse. There is also important peatland featured 35 m south of this habitat, which is associated with being surface water fed. The underlying hydrogeology is a low	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies directly beneath S2, special arrangement area and temporary access tracks.

NVC Code	NVC Community	Section	Potential GWDTE Location	Potential Groundwater Dependency based on NVC Class	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
					productivity aquifer and the habitat is therefore likely surface water fed and not highly groundwater dependent. The habitat north of S24 is within a low-lying on the flood plain of the Kyle of Sutherland. The TWI is high and surface water flowpaths travel through the habitat. The underlying hydrogeology is a low productivity aquifer. Therefore, the habitat has been assessed as surface water fed and not groundwater dependent. The habitat south of S35 is on a moderately steep gradient and is located along the banks of an OS mapped watercourse and the stream network runs through it. The TWI is moderate and the underlying hydrogeology is a low productivity aquifer. Based on this the habitat is assessed as surface water fed and not groundwater dependent.		The habitat lies 55 m north of S24 and the S24 temporary tower compound area lies 10 m from the habitat. The habitat lies 55 m south of S35 and the S35 temporary tower compound area lies 30 m from the habitat. The habitat is within a permanent access track that is adjacent to S35.
		Section D	Small habitat area beneath S56 and permanent access track adjacent to S56. Small habitat area beneath.	High	The habitat beneath S56 is situated on a steep hillside with runoff draining northeast to the Abhainn a' Choire Bhuig 200 m downgradient of the habitat. The TWI is moderate. The stream network shows flowpaths through the habitat. This habitat features an area of 2 m deep peatland, which is associated with being surface water fed. The underlying hydrogeology is a low productivity aquifer. Therefore, the habitat is considered surface water fed and not highly groundwater dependent. The habitat beneath S102 is on a steep hillslope and is located along the banks of an OS mapped watercourse that flows into Allt Strath an Loin. The TWI is moderate. Although the underlying hydrogeology is a moderately productive aquifer, the proximity of the habitat to the unnamed burn and the steep topography which will encourage surface water runoff means the habitat is assessed as surface water fed and not highly groundwater dependent.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat is directly beneath S56 and permanent access track adjacent to S56. The habitat lies directly beneath S102 temporary tower compound area and 20 m from S102.
		Section E	Small area west of S228.	High	The habitat next to S228 is situated on an area of gentle topography with a low TWI. The habitat has a surface water flow path on its southern border that does not enter the habitat which appears to be a flow path that leads into the River Beauly. There is also a wet grassland area 30 m north of this habitat. The aerial imagery shows land modifications with potential drainage channels carved into the landscape which will have modified surface water drainage and be encouraging accumulation and channelisation of flow in the area. The habitat is near to a peat bog, which is associated with being surface water fed. The underlying hydrogeology is a moderately productive aquifer but the surface water hydrology	The habitat is considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 80 m west of S228 and the S228 temporary tower compound area lies 40 m from the habitat.

NVC Code	NVC Community	Section	Potential GWDTE Location	Potential Groundwater Dependency based on NVC Class	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
					of the area suggests this habitat is not highly groundwater dependent.		
M32	*Philonotis fontana - Saxifraga stellaris spring*	Section A	Small area west of N198. Small area beneath the access tracks that are connected to N202.	High	The habitat west of N198 is situated on a steep hillslope where high runoff would be expected as shown by the surface watercourse that flows through it. The underlying hydrogeology is a moderately productive aquifer but the association with nearby surface water features and steep topography means the habitat is considered surface water fed and not highly groundwater dependent. The habitat beneath the permanent access tracks that are connected to N202 is located along the banks of Kintradwell Burn and the underlying hydrogeology is a low productivity aquifer. Therefore, it is assessed as surface water fed and not groundwater dependent	The habitat is considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 90 m west of N198 and the N198 temporary tower compound area lies 40 m from the habitat. The habitat lies within the permanent access tracks that are connected to N202. N202 is 830 m west of this habitat.
M6	Carex echinata - Sphagnum recurvum mire	Section A	• A small area east of N29. • Small cluster east of N40. • Small area west of N182 within the permanent access track that connects to N182. • Small area west of N198.	High	The habitat east of N29 is located along the banks of a surface water flow path which is a tributary of the Halsary Burn. It is situated on a gentle slope and has a high TWI. The underlying hydrogeology is a moderately productive aquifer but due to its association with nearby surface water features and the TWI the habitat has been assessed as likely surface water fed and not highly groundwater dependent. The habitat east of N40 is situated on a moderate sloping topography and has a moderate TWI. It is also surrounded by surface water flowpaths that leads into Little River watercourse. The underlying hydrogeology is a moderately productive aquifer, but due to its association with nearby surface water flow paths, moderate sloping topography and moderate TWI, the habitat has been assessed as likely surface water fed and not highly groundwater dependent. The habitat west of N182 is located along the banks of the Loth Burn watercourse. It is situated on a moderate slope in an area of moderate TWI. A tributary of the Loth Burn flows through this habitat. Therefore, although the underlying hydrogeology is a moderately productive the habitat has been assessed as surface water fed and not groundwater dependent. The habitat west of N198 is situated on a steep hillslope where high runoff would be expected as indicated by the stream network which shows a surface water flowpath through this habitat which flows into the Kintradwell Burn. The underlying hydrogeology is a moderately productive but due to its association with surface water features and based on the	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 50 m east of N29 and the N29 temporary tower compound area lies 20 m from the habitat. The habitat lies 130 m east of N40 and the N40 temporary tower compound area lies 100 m from the habitat. The habitat lies 70 m west of N182 and the N182 temporary tower compound area lies 25 m from the habitat. The habitat lies within a temporary access track that connects to N182. The habitat lies 85 m west of N198 and the N198 temporary tower compound area lies 40 m from the habitat.

NVC Code	NVC Community	Section	Potential GWDTE Location	Potential Groundwater Dependency based on NVC Class	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
					topography the habitat is not considered highly groundwater dependent		
		Section B	• Small area northwest of N205. • Small area north of N214 and permanent access track that connects to N214.	High	The habitat northwest of N205 is situated on a steep hillslope with a moderate TWI. A surface water flow path travels through this habitat which is a tributary to Clynemilton Burn. The underlying hydrogeology of the habitat is between a moderately productive aquifer and a low productivity aquifer. Despite the moderate aquifer productivity the proximity to surface water features and steep topography means the habitat has been assessed as surface water fed and not groundwater dependent. The underlying hydrogeology of the habitat north of N214 is a moderately productive aquifer, however the habitat is situated on a steep hillslope and has a high TWI. It is also upgradient of surface water flow paths that are tributaries of Loch Brora. Therefore, it is assessed as surface water fed and not groundwater dependent.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies on the northwestern border of N205. The habitat lies 260 m north of N214 and the N214 temporary tower compound area lies 210 m from the habitat. It also lies 60 m north of the permanent access track that connects to N214.
		Section C	Small area northwest of S9.	High	The habitat northwest of S9 is on a steep hillslope. The underlying hydrogeology is a low productivity aquifer. It is upgradient of a surface watercourse and due to its steep topography likely leads surface water into this watercourse. These features mean that the habitat has been assessed as surface water fed and not groundwater dependent.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 380 m northwest of S9 and the S9 temporary tower compound area lies 350 m from the habitat.
		Section D	• Small habitat area beneath S56. • Small cluster beneath S59. • Small area southwest of S66. • Small cluster east of S70 and permanent access track that connects to S70.	High	The habitat beneath S56 is situated on a steep hillslope with a moderate TWI. There are nearby surface water flowpaths that flow into the Abhainn a Choire Bhuig watercourse 80 m downgradient of the habitat. The underlying hydrogeology is a low productivity aquifer with water that virtually all travels through cracks and other discontinuities. Therefore, due to its steep topography, low productivity aquifer, and association with the stream network the habitat has been assessed as surface water fed and not groundwater dependent. The habitat beneath S59 is situated on a hillslope. Surface water flowpaths travels through the habitat and the TWI is high. The underlying hydrogeology is a low productivity aquifer. Based on this the habitat is considered surface water fed and not highly groundwater dependent. The habitat southwest of S66 is at the base of hillslope and adjacent to a surface watercourse. The TWI of the area is moderate and the underlying hydrogeology is a low productivity aquifer. Therefore, the habitat has been assessed as surface water fed and not groundwater dependent	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies directly beneath S56. The habitat lies directly beneath S59. The habitat lies 130 m southwest of S66 and the S66 temporary tower compound area lies 90 m from the habitat. The habitat lies 60 m east of S70 and the S70 temporary tower compound area lies 25 m from the habitat. It also lies 25 m from the permanent access track that connects to S70.

NVC Code	NVC Community	Section	Potential GWDTE Location	Potential Groundwater Dependency based on NVC Class	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
					A cluster of habitats are east of S70. The habitats are situated along a surface water flowpath which is a tributary of Abhainn Glac an t-Seilich. The habitat is on a steep hillslope with a moderate TWI. The habitat reaches up hill to the east. The underlying hydrogeology is a low productivity aquifer. Based on this the habitat has been assessed as surface water fed and not groundwater dependent.		
W7	*Alnus glutinosa - Fraxinus excelsior - Lysimachia nemorum woodland*	Section B	• Small area north of temporary access track that connects to N264. • Small area north of temporary access track that connects to N269. • Small area that is south of N275 and is crossed by a permanent access track that connects to N275.	High	The habitat north of the N264's temporary access track is situated on a low-lying area at the bottom of a steep hill and has a high TWI. A surface watercourse flows through the habitat. The underlying hydrogeology is a low productivity aquifer. Therefore, the habitat has been assessed as surface water fed and not groundwater dependent. The habitat north of N269's temporary access track is situated on steep terrain and has a moderate TWI. Surface water from the hillside flows into the River Fleet. The underlying hydrogeology is a low productivity aquifer therefore, the habitat has been assessed as surface water fed and not groundwater dependent. The habitat which is south of N275 is located along the banks of the Abhainn an-t Sratha Charnaig watercourse and there are surface water flowpaths through it. The TWI is moderate. The underlying hydrogeology is a low productivity aquifer. Therefore, due to its association with nearby surface water features, moderate TWI, and low productivity aquifer, the habitat has been assessed as surface water fed and not groundwater dependent.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 80 m north of temporary access track that connects to N264. The habitat lies 10 m north of temporary access track that connects to N269. The habitat lies 130 m south of N275 and the N275 temporary tower compound area lies 90 m from the habitat. The habitat also lies directly beneath the permanent access track that connects to N275.
		Section D	Cluster north of S39.	High	The habitat that is north of S39 is situated in a low-lying area in the flood plain of the River Carron. The TWI is moderate. The underlying hydrogeology is a low productivity aquifer. Based on this the habitat has been assessed as surface water fed and not groundwater dependent	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 120 m north of S39 and the S39 temporary tower compound area lies 80 m from the habitat.
		Section E	• Small area west of S161. • Small area northeast of S166. • Cluster south of S174.	High	The habitat west of S161 is situated on a moderate slope located along the banks of Loch na Crann, a surface waterbody. It is near to surface water flowpaths that flows into the loch. The underlying hydrogeology is a low productivity aquifer. Therefore, the habitat has been assessed as surface water fed and not groundwater dependent The habitat which is northeast of S166 is situated on a moderate slope and has a moderate TWI. It is also within an area of forestry where drainage paths will have been altered. There are surface water flow paths that travel through this habitat. Although the underlying hydrogeology is a moderately	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 170 m west of S161 and the S161 temporary tower compound area lies 140 m from the habitat. The habitat lies 105 m northeast of S166 and the S166 temporary tower compound area lies 70 m from the habitat. The habitat lies 45 m south of S174 and the S174 temporary tower compound area lies 10 m from

NVC Code	NVC Community	Section	Potential GWDTE Location	Potential Groundwater Dependency based on NVC Class	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
					productive, due to its association with nearby surface water features, moderate TWI, and topography, the habitat has been assessed as surface water fed and not groundwater dependent. The cluster that is south of S174 is situated on a low-lying area on the flood plain of the River Conon. The underlying hydrogeology is a moderately productive aquifer, but the TWI us moderate and the habitat is adjacent to the River Conon where surface water inputs to the habitat are likely to be high. Therefore, the habitat is not assessed as being highly groundwater dependent.		the habitat. The habitat also lies 5 m south of the temporary access track that connects to S174.
W4	*Betula pubescens - Molinia caerulea woodland*	Section A	• Small area northwest of N26. • Small area south of N148.	High	The habitat that is situated northwest of N26 is in a low-lying area located along the banks of a large watercourse. The TWI is moderate. Although the underlying hydrogeology is a moderately productive aquifer, the proximity to surface water features and moderate TWI means the habitat is assessed as surface water fed and not groundwater dependent. The habitat south of N148 is in a low-lying area of the floodplain of the River Helmsdale. The habitat is surrounded by surface water flow paths that are tributaries to this watercourse. The TWI is moderate. The underlying hydrogeology is a low productivity aquifer. Therefore, the habitat has been assessed as surface water fed and not groundwater dependent.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 120 m northwest of N26 and the N26 temporary tower compound area lies 85 m from the habitat. The habitat lies 90 m south of N148 and the N148 temporary tower compound area lies 30 m from the habitat.
		Section B	• Large area north of N218 and permanent access track that connects N219. • Small area north of permanent access track that connects to N245. • Cluster north of N286.	High	The habitat north of N218 is situated on a steep hillslope. It features a surface watercourse that travels through the habitat and leads into Loch Brora. Although the underlying hydrogeology is a moderately productive aquifer, the surface watercourse and steep topography means the habitat has been assessed as surface water fed and not groundwater dependent. The habitat near the permanent access track connected to N245 is situated on a moderate slope. The underlying hydrogeology is a moderately productive aquifer. The TWI shows an area of high wetness through the centre of the habitat. The aerial imagery shows drainage paths through the habitat. Therefore, it has been assessed as surface water fed and not groundwater dependent. The habitat that is north of N286 is situated on a steep hillslope. Flowpaths show runoff coming down the hillside and	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies 350 m north of N218 and 250 m north of permanent access track that connects to N219. The habitat lies 50 m north of permanent access track that connects to N245. The habitat lies 245 m north of N286 and the N286 temporary tower compound area lies 200 m from the habitat.

NVC Code	NVC Community	Section	Potential GWDTE Location	Potential Groundwater Dependency based on NVC Class	Hydrological and Hydrogeological Setting / Hydrogeological Assessment of groundwater dependency	Groundwater Dependency Based on the Hydrogeological Assessment	Distance from Infrastructure
					into the Abhainn t-Sratha Charnaig river, with parts of this habitat cluster located along the banks of the watercourse. The TWI is moderate. The underlying hydrogeology is a low productivity aquifer. Based on this the habitat is considered surface water fed and not groundwater dependent.		
		Section D	• Small habitat area beneath S38. • Small area east of S137.	High	The habitat beneath is situated on a gentle slope with a moderate TWI. Surface water flow paths travel through this habitat and flow into the River Carron. The underlying hydrogeology is a low productivity aquifer. Therefore, due to its association with nearby surface water features and low aquifer productivity, the habitat has been assessed as surface water fed and not groundwater dependent The habitat east of S137 is underlain by a moderately productive aquifer but is situated on a moderately steep hillslope where high levels of runoff would be expected. The habitat is adjacent to a surface water flowpath which flows into the Abhainn Sgitheach. Based on the proximity to a surface water flowpath and being on steep terrain, the habitat has been assessed as surface water fed and not highly groundwater dependent.	The habitats are considered to be surface water dependent / have a low groundwater dependency.	The habitat lies directly beneath S38 and temporary access track that connects to S38 is 5 m north of the habitat. The habitat lies 80 m east of S137 and the S137 temporary tower compound area lies 40 m from the habitat. The permanent access track that connects to S137 is 20 m north of the habitat.

Summary

1.6.3 As shown in **Table 2** and **Table 3** above, a contribution from groundwater cannot be entirely ruled out for all GWDTEs. **Table 4** and **Volume 3, Figure 10.12: Groundwater Dependent Terrestrial Ecosystems Based On Hydrological Assessment** summarise those habitats which are considered to be at least partly groundwater dependent and (based on the matrix in **Table 1** of this technical appendix) potentially sensitive habitats with the potential to be impacted by the Proposed Development.

1.6.4 However, based on the above analysis the majority of the habitats are not considered groundwater dependent due to their correlation with;

- Watercourses and surface water flowpaths,
- Areas of altered drainage e.g. in forestry,
- Areas where aerial imagery shows drainage channels,
- Areas of moderate to high TWI, and
- The underlying hydrogeology being a low productivity aquifer.

1.6.5 Based on the matrix in **Table 1** of this technical appendix, these surface water fed habitats are considered either potentially sensitive or not sensitive. Those that are potentially sensitive (High groundwater dependency based on the NVC assessment, but Low groundwater dependency based on the hydrogeological assessment) are considered potentially sensitive to changes in surface water runoff, not groundwater impacts. Mitigation to avoid impacts to these habitats are outlined in **Table 4** below and detailed in **Section 10.7** of this technical appendix.

Table 4: Summary of Groundwater Dependent GWDTEs

Section & Location	NVC Code & GWDTE Classification	Groundwater Dependency Based on Hydrogeological Assessment	GWDTE Sensitivity	Hydrogeological Setting	Distance from Infrastructure	Mitigation required
Section A - N84 (northern habitat extent[13])	M15 Moderate	Moderate	Potentially sensitive GWDTE	The habitat at N84 is located on a plateau above the Dunbeath Water. There is an approximately 50 m change in elevation between the habitat beneath N84 and the Dunbeath Water, meaning it is disconnected from the active floodplain of the river. This is confirmed by the SEPA Flood Mapping which shows the areas beneath the cliff as having minimal overlap with the high likelihood (1 in 10 year) flood extent. The stream network shows a watercourse on southern fringes of the northern habitat extent, and the OS Vector mapping shows one field drain running through the habitat to the southeast, but the TWI does not indicate high levels of topographic wetness around the field drain or the rest of the northern extent habitat across the plateau. The underlying hydrogeology is a low productivity aquifer, but based on the topography, TWI, and stream network, it is difficult to rule out an element of groundwater dependency in the northern extent of the habitat. It is therefore still considered moderately groundwater dependent.	Directly below N84 and associated temporary tower compound area. This breaches the SEPA 250 m buffer zone.	• Detailed quantitative risk assessment which will include a ground investigation. • Consultation with SEPA. • Groundwater monitoring pre-, during, and post construction. • Construction works to be overseen by an ECoW.

[13] There is one habitat covering N84-86 with a pinch point between N84 and N85. The habitat has been assessed in two sections: the area around N84 south to the pinch point (northern habitat extent), and the area south of the pinch point beneath N85 and N86 (southern habitat extent).

Section & Location	NVC Code & GWDTE Classification	Groundwater Dependency Based on Hydrogeological Assessment	GWDTE Sensitivity	Hydrogeological Setting	Distance from Infrastructure	Mitigation required
Section B – between N212 and N213	M15 Moderate	Moderate	Potentially sensitive GWDTE	The habitat between N212 and N213 lies in a flat area with no mapped watercourses or stream network. The TWI indicates low surface water accumulation and it is on the plateau above An Dubh-lochan. The area is underlain by a low productivity aquifer. Based on the lack of surface water features a dependency on groundwater dependency cannot be ruled out, and it remains a moderate GWDTE habitat.	80 m from N212 and 60 m from N212 temporary tower compound area. 90 m from N213 and 60 m from N213 temporary tower compound area. This breaches the SEPA 250 m buffer zone.	• Detailed quantitative risk assessment which will include a ground investigation. • Consultation with SEPA. • Groundwater monitoring pre-, during, and post construction. • Construction works to be overseen by an ECoW.
Section E – S189	M16 High	Moderate	Potentially sensitive GWDTE	Habitat to the west of S189 is on a steep hillslope where high levels of surface water runoff would be expected. This habitat is not associated with mapped surface water flow paths and the underlying hydrogeology is a moderately productive aquifer. The TWI indicated areas of high wetness on the fringes of the habitat but lower in the centre. Due to the lack of surface water flow paths, low TWI nearer the centre of the habitat, and moderately productive aquifer, it is not possible to completely rule out groundwater dependency. However, due to the topography and high TWI on the fringes of the habitat it is assessed as being moderately rather than highly groundwater dependent.	25 m west of S189 This breaches the SEPA 250 m buffer zone.	• Detailed quantitative risk assessment which will include a ground investigation. • Consultation with SEPA. • Groundwater monitoring pre-, during, and post construction. • Construction works to be overseen by an ECoW.

1.7 Mitigation Measures and Recommendations

Surface Water Dependent Habitats

1.7.1 The majority of the GWDTE areas are assessed as not being groundwater dependent, but instead reliant on surface water runoff. Therefore, it is considered that the maintenance of surface water quality and quantity, and distribution to these habitats is important.

1.7.2 Measures to ensure the continued supply of surface water and maintenance of water quality during construction are provided in **Volume 2, Chapter 10: Water Environment** and will be implemented via the Construction Environmental Management Plan (CEMP) to be developed by the Principal Contractors. Mitigation measures will include the following:

- Implementation of suitable construction drainage systems to maintain the quantity and quality of surface water supply during the construction phase of the Proposed Development;
- Maintenance of flow paths/ redistribution of water where diverted;
- Implementation of pollution control measures; and
- The Principal Contractors will follow relevant SSEN Transmission's General Environment Management Plans (GEMPs), SEPA best practice guidance, and produce Pollution Prevention Plans (PPPs) prior to works. Full details of these can be found in **Volume 5, Appendix 3.3: GEMPs and Volume 5, Appendix 10.4: Site Water Management and Pollution Prevention Plan**.

1.7.3 During the operational phase of the Proposed Development, Sustainable Drainage Systems (SuDS) will be in place to maintain water quality and quantity. The Applicant must undertake regular maintenance of all SuDS based on SEPA Guidance[14] to ensure they are performing as required.

Groundwater Dependent Habitats

1.7.4 The remaining habitats which are considered potentially groundwater dependent and therefore sensitive or potentially sensitive will require further mitigation. These habitats are set out in **Table 4**.

1.7.5 As per the SEPA GWDTE Guidance[4], buffer zones are required around these GWDTE habitats as follows:

- 10 m radius of all activities;
- 100 m radius of all subsurface activities <1 m in depth; and
- 250 m of all subsurface activities >1 m in depth.

1.7.6 For the Proposed Development, 250 m buffers will be required around all towers, while 100 m buffers will be needed around all proposed access tracks and temporary tower compound areas, due to the depths of excavation needed.

1.7.7 The good practice construction and design measures set out in WE5 in **Table 10.5 of Volume 2, Chapter 10: Water Environment** will be implemented during construction and secured through the CEMP and GEMPs to ensure that effects on designated and wetland habitats are minimised.

[14] SEPA. Regulatory Method (WAT-RM-08) Sustainable Urban Drainage Systems (SUDS or SUD Systems). V6.4. July 2019. Available online at: Regulatory Method (WAT-RM-08) Accessed April 2025.

1.7.8 **Table 4** shows that all groundwater dependent habitats identified through this hydrogeological assessment breach the 250 m and 100 m buffer zones, and therefore are subject to additional mitigation in accordance with SEPA Guidance on Assessing the Impacts of Development Proposals on GWDTEs.

1.7.9 The need and methodology for any monitoring will be secured and agreed with SEPA on a case-by-case basis, and in accordance with the approach set out in WE5 in **Table 10.5 of Volume 2, Chapter 10: Water Environment**.

1.7.10 In addition, construction works will be overseen by an Ecological Clerk of Works (ECoW).

1.8 Conclusions

1.8.1 Excavation of soil and bedrock during the construction phase of the Proposed Development may cause localised disruption and interruption to groundwater flow. Interruption of groundwater flow could potentially reduce the supply of groundwater to GWDTEs, thereby causing an alteration or change in the quality and / or quantity of groundwater, and / or a change in the physical or biological characteristics of the GWDTE.

1.8.2 NVC surveys carried out between April and October 2024, with additional surveys undertaken in January 2025, identified a number of habitats with the potential to be Highly or Moderately groundwater dependent.

1.8.3 A hydrogeological assessment has been used to qualitatively determine the potential groundwater dependency and sensitivity of each potential GWDTE. The assessment included consideration of:

- The direct hydrological connection of a potential GWDTE to surface water sources;
- Stream network and TWI;
- Underlying hydrogeological conditions including aquifer productivity,
- The presence of peat habitats;
- Land use; and
- The presence of springs.

1.8.4 The assessment has concluded the majority of GWDTEs identified along the Proposed Development are not considered groundwater dependent because:

- The majority of the habitats are located on or at the base of a steep hillslopes where surface water runoff is likely to be high. This is indicated by the stream network mapping indicating preferential flow paths and areas of surface water accumulation;
- The habitat is associated with areas of moderate to high TWI;
- The underlying hydrogeology is a low productivity aquifer with limited groundwater in the near surface weathered zone and secondary fractures and therefore unlikely to support the GWDTE habitats;
- Land use which includes commercial forestry which will have significantly altered drainage patterns encouraging preferential drainage flow paths to support surface water contribution.

1.8.5 For these habitats mitigation is required to ensure the quality and quantity of surface water to these habitats is maintained. These measures will be set out in the CEMP (including a PPP) to be written by the Principal Contractors, and are discussed in **Volume 2, Chapter 10: Water Environment**.

1.8.6 However, for those habitats considered to have a potential groundwater dependency and thus are classified as being potentially sensitive habitats, additional mitigation is required as follows:

- Good practice construction and design measures set out in WE5 in Table 10.5 of **Volume 2, Chapter 10: Water Environment**;
- A detailed quantitative risk assessment, to include a ground investigation and groundwater monitoring. The need and methodology of the quantitative risk assessment, ground investigation and groundwater monitoring will be agreed with SEPA on a case-by-case basis. This agreement will be at least 12 months prior to the construction to allow for 12 months of pre-construction baseline monitoring if required, as per SEPA Guidance on Assessing the Impacts of Development Proposals on GWDTEs; and
- Construction works to be overseen by an Ecological Clerk of Works (ECoW).

1.8.7 The specific details of the further mitigation will be set out within the CEMP to be developed by the Principal Contractors. The appropriate consultation with relevant consultees including SEPA will be carried out by the Principal Contractors e.g. to determine the monitoring specifications.