Technical note: Lorg Wind Farm - Groundwater Dependent Terrestrial Ecosystems Assessment

1. Introduction

This assessment forms an appendix (Appendix 13A) to **Chapter 13** of the Lorg Wind Farm (the 'Proposed Development') **Environmental Impact Assessment (EIA) Report**. The EIA Report is in support of a planning application made by RWE to install fifteen wind turbines, with the associated infrastructure and ancillary development, including, for example, crane pad hardstanding areas, access tracks, electrical cabling, transformers, substation and control buildings, meteorological masts, temporary construction compounds and borrow pits. The Development Site is located approximately 12.3 km south-west of Sanquhar and 11 km north-east of Carsphairn and it encompasses land within Dumfries and Galloway and East Ayrshire, with the greater part of the Development Site (and 12 of the 15 wind turbines) are located within Dumfries and Galloway (**EIA Report Figure 13.1**).

The National Vegetation Classification (NVC) habitat survey of the Development Site, undertaken by WSP, has identified the presence of a number of potential groundwater dependent terrestrial ecosystems (GWDTEs). GWDTEs, which are types of wetland, are specifically protected under the Water Framework Directive (WFD, 2000/60/EC) which has been transposed into domestic legislation by the Environment (EU Exit) (Scotland) (Amendment etc.) Regulations 2019. As discussed in the **EIA Report Chapter 13**, the WFD, now the Environment Regulations 2019, and supporting domestic legislation, established a legal framework for the protection, improvement and sustainable use of surface waters, transitional waters, coastal waters and groundwater resources, including GWDTEs.

As such, assessment of the GWDTEs in the vicinity of the Proposed Development is required. The aim of this report is, therefore, to firstly assess the potential groundwater dependency of each of the NVC communities that have been identified by survey at the Proposed Development. Secondly, those communities that have the potential to be of Moderate or High dependence on groundwater, in accordance with Scottish Environment Protection Agency (SEPA) Land Use Planning System Guidance Note 31 (LUPS-GU31), have then been considered further, with the aim being to identify true groundwater dependence and appropriate mitigation measures, such that potential impacts from the Proposed Development are minimised.

2. Method of Assessment

LUPS-GU31 stipulates that a hydrogeological assessment of the impacts upon GWDTEs is required where sensitive receptors lie within 100m of all excavations less than 1m in depth (typically new or upgraded access tracks or hardstanding), or within 250m of all excavations greater than 1m deep (typically turbine foundations or borrow pits). Based on a precautionary approach, all such potential habitats within the Proposed Development have been identified, and

those considered by the LUPS-GU31 as having Moderate and High potential groundwater dependence have been assessed further for 'actual' groundwater dependence.

The assessment presented in Section 3 determines the likelihood of actual groundwater dependency. The likelihood of groundwater dependency has been determined through identification of underlying geology and its hydraulic properties, the local topography, and the contribution of water to the habitat from surface water.

The nature of the underlying geology determines its porosity, permeability and groundwater throughflow, which in turn will influence the water supply to wetland habitats. Groundwater flow within low permeability bedrock is limited to lines of faults and/or fractures and, thus, is only present where these features exist. Porous bedrock or superficial deposits are likely to support intergranular flow, which is the movement of water between grains. For the purposes of the GWDTE assessment, where the habitat is overlying and/or in the immediate vicinity of permeable or faulted geology, and other considerations are favourable (see below), the likelihood of a groundwater contribution is deemed to be the same as the original SEPA designation in Appendix 4 of LUPS-GU31.

Some NVC communities may be present due to a combination of contributions from surface water (which could be natural or artificially influenced), peat or by their location on flat terrain. These habitats are likely to be almost entirely fed by precipitation or very near-surface groundwater within shallow drift deposits and soils. It is considered that the groundwater component supporting these habitats therefore more resembles a surface (or near-surface) water regime, with very local and shallow rain-fed catchments for each GWDTE. For the purposes of the GWDTE assessment, these habitats are considered to have a Low dependency on groundwater.

Following the assessment of the actual groundwater dependence of each habitat, those habitats that remain with a Moderate or High dependency rating and which reside within LUPS-GU31 buffer zones are assumed to be potentially affected by the construction and operation of the Proposed Development. In Section 4 an assessment of potential and residual (post-mitigation) effects on these GWDTEs is presented, following a slightly modified form of the significance assessment methodology described in the Proposed Development **EIA Report Chapter 13, Section 13.2**.

The conclusions of the assessment are finally presented in Section 5.

3. Assessment of Actual Groundwater Dependence

The locations of all potential Moderate and High groundwater dependence GWDTEs are illustrated in relation to the Proposed Development and the topography (**Figure 1**), superficial geology (**Figure 2**) and solid geology (**Figure 3**). Each of the NVC communities with groundwater dependence (according to LUPS-GU31: Appendix 4) have been identified from the NVC survey (EIA Report Chapter 11, Ecology), and numbered accordingly. Then, they are assessed for actual groundwater dependence and, if considered to be truly groundwater dependent, their proximity to the Proposed Development infrastructure is also provided in **Annex A**. Those habitats which are assessed as truly groundwater dependent are presented in **Figure 4**, with LUP-GU31 buffers applied and an estimated zone of contribution (ZOC) indicated.

The majority of the habitats identified as of Moderate or High potential groundwater dependency have been assessed to be of Low actual groundwater dependence, based on their hydrogeological and topographical settings. For example, habitat GT12, which contains an NVC community (M6) classified as potentially highly groundwater dependent, overlies superficial and solid geology of low hydraulic conductivity. It is located within peat deposits on relatively flat topography at the Fans of

Altry at the headwaters of Pulmulloch Burn, with no more permeable geology upgradient of it. Therefore, the presence of a significant groundwater component feeding the habitat is unlikely, and a surface water supply to the habitat is considered more probable. Such habitats are therefore not considered any further within this assessment and are 'scoped out' from further assessment within the EIA. In addition, those habitats that are not located within LUPS-GU31 100 m (from excavations <1 m) and 250 m (from excavations >1 m) buffers are also 'scoped out'.

Six habitats have been confirmed as being of actual Moderate or High groundwater dependence and within LUPS-GU31 buffers. These are habitats GT37, GT78, GT80 - GT82 and GT85 and all are associated with either high permeability superficial deposits, faults or intrusive dykes. These habitats are assessed further with respect to the construction and operation of the Proposed Development in Section 4 below and retained in the EIA.

4. GWDTE Assessment

4.1 Assessment Approach

Excavation and placement of soil and bedrock and/or active dewatering and pollution events during construction and operation of the Proposed Development could disrupt the quantity and/or quality of water supplying a nearby Moderate or High GWDTE. On this basis, it is considered that the six GWDTEs identified in Section 3 would potentially be affected by the Proposed Development and require further assessment.

With respect to the effects in terms of groundwater flow to the GWDTEs, the estimated direct habitat loss, i.e. planned removal of the Proposed Development infrastructure, and loss of the ZOC, i.e. groundwater catchment, for each of these GWDTEs as a result of the Proposed Development, is first considered. The categorisation for both 'direct habitat loss' and 'loss of ZOC' ranges from None (0%), through Slight (<10%) and Moderate (10-50%) to Substantial (>50%) and can be taken as broadly analogous to the very low, low, medium and high magnitude classes of the main EIA Report (**Chapter 13, Table 13.4**).

The direct habitat loss is relatively easily determined by calculating that proportion of the habitat overlain by the proposed infrastructure. The loss of the ZOC is more difficult to determine but can be calculated by comparing the location of the infrastructure with that of the ZOC and the supplying fault(s). This part of the assessment is based on the following considerations:

- The proportion of the ZOC that is potentially disrupted catchment (that part of the ZOC lying downgradient of an intersecting track, plus the additional habitat within 250m of a turbine or borrow pit, as a combined proportion of the total habitat area); and
- The proportion of fault length within 250m of a turbine or borrow pit.

The overall percentage of loss of ZOC is whichever of these two proportions is the greatest. By considering the location of the relevant fault compared to the habitat, together with topographical considerations, this approach assumes the fault provides the primary source of groundwater to the vegetation species on the habitats and is also precautionary.

The direct habitat loss, together with the ZOC loss and anticipated water quality effects (scored using the EIA magnitude criteria), are then used to qualitatively assess the magnitude of potential flow and quality effects. The habitat importance, overall magnitude of effect and significance of effect are then classified in accordance with the criteria of EIA Report **Tables 11.8**, **13.4** and **13.5**, respectively. To facilitate this, four ecological importance values (International/European, National, Regional / County and Local/Negligible) are considered broadly to equate to the four water feature value classes (high, medium, low and very low).

An assessment is then made of the residual, i.e. post-mitigation, flow and quality effects on the GWDTEs from the Proposed Development. This assessment takes account of the relevant mitigation measures that would be employed during the construction, operation and decommissioning of the Proposed Development (and which are outlined in **Chapter 13: Geology, Hydrogeology and Hydrology** of the EIA Report) to minimise potential effects.

4.2 Findings of Assessment

Introduction

The outcomes of the assessment for each of the six GWDTEs are presented in **Table 4.1**, with the detailed evaluation for each habitat provided in the descriptions below.

GT37

This habitat is located on steep topography on the south-west facing slope of Lorg Hill with the access track intersecting the site. Although the access track is within the habitat, the habitat's SEPA 250m buffer does not intercept any proposed turbines or either of the borrow pits.

The habitat comprises M23 (rush-pasture) vegetation of High groundwater dependence. A number of faults and igneous intrusions intersect the habitat, which may provide the main source of groundwater in weathered 'contact' zones with the rocks of the Kirkcolm Formation (greywacke, sandstone and siltstone) and Moffat Shale Group (mudstone) (**Figure 3**) and from recent recharge via intergranular flow from the permeable hummocky glacial deposits. It is also likely to receive a significant supply of surface water from surface runoff from the low permeability till deposits underlying part of the habitat.

The construction of the access track is likely to lead to a slight direct loss of habitat and there is also likely to be a moderate reduction in its ZOC from the Proposed Development infrastructure. The potential effect on the quality of the water supporting the GWDTE is considered to be low, and the overall (flow and quality) potential magnitude of change on this low value receptor would be low and would lead to a '**not significant**' effect.

Mitigation would further reduce these limited effects. These measures include the use of appropriate track drainage design upgradient of the habitat, including cross drains to allow water to travel downslope of the track. The re-use of filtrated water from any settlement pond could be used to provide a compensatory water source for the habitat by discharging to a vegetated surface just upgradient of the habitat, although this is unlikely to be necessary. Other mitigation measures throughout the life cycle of the Proposed Development are further detailed in the EIA Report **Chapter 13**. As such, the assessed magnitude of residual change to this habitat is very low, and '**not significant**'. The same mitigation would also minimise disruption of the habitat's surface water supply.

GT78

This habitat lies in the Lorg Burn and Alwhat Burn valley, between Lorg, Ewe and Brown Hills with the access track intersecting the site. Although the access track is within the habitat, the habitat's SEPA 250m buffer does not intercept any proposed turbines or either of the borrow pits.

This mosaic habitat includes M23 (rush-pasture) vegetation, of High groundwater dependence. A number of faults and igneous intrusions intersect the habitat, which may provide the main source of groundwater in weathered 'contact' zones with the rocks of the Kirkcolm Formation and Moffat Shale Group (**Figure 3**). In addition, localised shallow groundwater may be present as a result of recent recharge, occurring at the interface between outcropping bedrock and glacial hummocky

deposits near Lorg Burn and at the interface between till and the glacial deposits also adjacent to Lorg Burn, via intergranular flow. Nonetheless, given the very steep topography, it is likely that a proportion of surface, or very near surface water would be sourced from surface run off and from the burns (Green Cleugh Burn, Lorg Burn and Alwhat Burn) which flow through the habitat.

The construction of the access track is likely to lead to a slight loss of habitat, and there is likely to be a slight encroachment upon its ZOC from the Proposed Development infrastructure. The potential effect on the quality of the water supporting the GWDTE is assessed as low, and the overall (flow and quality) potential magnitude of change on this low value receptor would be low, and '**not significant**'.

Mitigation would further reduce these limited effects. These measures include the use of appropriate track drainage design upgradient of the habitat, including cross drains to allow water to travel downslope of the track. The re-use of filtrated water from any settlement pond could be used to provide a compensatory water source for the habitat by discharging to a vegetated surface just upgradient of the habitat, although this is unlikely to be necessary. Other mitigation measures throughout the life cycle of the Proposed Development are further detailed in the EIA Report **Chapter 13**. As such, the assessed magnitude of residual change to this habitat is very low, and '**not significant**'. The same mitigation would also minimise disruption of the habitat's surface water supply.

GT80

This habitat is located at the base of the valley between Lorg Hill and Ewe Hill with the access track intersecting its southern portion. Although the access track is within the habitat, its SEPA 250m buffer does not intercept any proposed turbines or either of the borrow pits.

The habitat comprises M6, mire, vegetation of High groundwater dependence. The habitat is likely to receive some of its groundwater supply from the interface between the Portpatrick Formation Wacke and the igneous intrusion (**Figure 3**) which is located immediately upgradient. The underlying, permeable, hummocky glacial deposits are also likely to provide a significant source of groundwater.

The construction of the access track would lead to a slight direct loss of habitat, but the proximity of the dyke means that there is a moderate potential reduction in groundwater flow to the feature. The potential effect on the quality of the groundwater supporting the GWDTE is considered medium, and the overall (flow and quality) potential magnitude of change on this low value receptor would be medium and would lead to a '**not significant**' effect.

Although considered '**not significant**', the potential effect on this habitat would nevertheless be further reduced through the use of appropriate track drainage design in the immediate vicinity of the habitat, including cross drains to allow water to travel downslope of the track. Other mitigation measures throughout the life cycle of the Proposed Development are further detailed in EIA Report **Chapter 13**. As such, the assessed magnitude of residual change to this habitat is considered to be low and would lead to a '**not significant**' effect. The same mitigation would also minimise disruption of the habitat's surface water supply.

GT81

This habitat is located at the base of the valley between Lorg Hill and Ewe Hill with the access track intersecting the site. Although the access track is within the habitat, the habitat's SEPA 250m and 100m buffers do not intercept any proposed turbines or either of the borrow pits.

The habitat contains M23, rush-pasture, vegetation of High groundwater dependence. The habitat is likely to receive much of its groundwater supply from the fault that occurs at the interface of Kirkcolm Formation and Moffat Shale Group and from the interface between the Moffat Shale

Group and the igneous intrusion (**Figure 3**). The underlying, permeable, hummocky glacial deposits may also provide a significant source of groundwater, as well as potential surface water inputs from the nearby unnamed tributaries of the Water of Ken and Lorg Burn, which flow through the habitat.

The construction of the access track would lead to a slight direct loss of habitat, but the proximity of the fault and dyke means that there is a moderate potential reduction in groundwater flow to the feature. The potential effect on the quality of the groundwater supporting the GWDTE is considered medium, and the overall (flow and quality) potential magnitude of change on this low value receptor would be medium and would lead to a '**not significant**' effect.

Although considered '**not significant**', the potential effect on to this habitat would nevertheless be further reduced through the use of appropriate track drainage design in the immediate vicinity of the habitat, including cross drains to allow water to travel downslope of the track. Other mitigation measures throughout the life cycle of the Proposed Development are further detailed in EIA Report **Chapter 13**. As such, the assessed magnitude of residual change to this habitat is considered to be low and would lead to a '**not significant**' effect. The same mitigation would also minimise disruption of the habitat's surface water supply.

GT82

This habitat is located at the base of the valley between Lorg Hill and Ewe Hill with the access track intersecting the site. Although the access track is within the habitat, its SEPA 250m buffer does not intercept any proposed turbines or either of the borrow pits.

The habitat comprises M23 and M6 (rush-pasture and mire) vegetation of High groundwater dependence. The habitat is likely to receive some of its groundwater supply from the interface between the Portpatrick Formation Wacke and the igneous intrusion (**Figure 3**) which is located immediately upgradient. The underlying, permeable, hummocky glacial deposits are also likely to provide a significant source of groundwater.

The construction of the access track would lead to a slight direct loss of habitat, but the proximity of the dyke means that there is a substantial potential reduction in groundwater flow to the feature. The potential effect on the quality of the groundwater supporting the GWDTE is considered medium, and the overall (flow and quality) potential magnitude of change on this low value receptor would be high and would lead to a moderate '**probably significant**' effect.

Although considered '**probably significant**', the potential effect on this habitat would nevertheless be further reduced through the use of appropriate track drainage design in the immediate vicinity of the habitat, including cross drains to allow water to travel downslope of the track. Other mitigation measures throughout the life cycle of the Proposed Development are further detailed in EIA Report **Chapter 13**. As such, the assessed magnitude of residual change to this habitat is considered to be medium and would lead to a '**not significant**' effect. The same mitigation would also minimise disruption of the habitat's surface water supply.

GT85

This habitat is located at the base of the valley between Altry Hill and Ewe Hill, in close proximity to the Water of Ken. The access track intersects the ZOC to the east of the habitat. Despite this the access track does not intercept its SEPA 250m for turbines or the borrow pits.

The habitat comprises MG9, grassland, vegetation of Moderate groundwater dependence. The habitat is likely to receive the majority of its groundwater supply via intergranular flow from the highly permeable alluvial deposits. It is also likely to receive a significant supply of surface water from the nearby Water of Ken and its unnamed tributary, plus surface runoff from the much less permeable till deposits underlying roughly half of the habitat.

The construction of the access track would not lead to any direct loss of habitat. However, as the track is located up stream of the habitat, this would mean that there would be a moderate potential reduction in groundwater flow to the feature. The potential effect on the quality of the groundwater supporting the GWDTE is considered medium, and the overall (flow and quality) potential magnitude of change on this very low value receptor would be medium and would lead to a '**not significant**' effect.

Although considered '**not significant**', the impact to this habitat would nevertheless be further reduced through the use of appropriate track drainage design in the immediate vicinity of the habitat, including cross drains to allow water to travel downslope of the track. Other mitigation measures throughout the life cycle of the Proposed Development are further detailed in the EIA Report **Chapter 13**. As such, the assessed magnitude of residual change to this habitat is considered to be low and would lead to a '**not significant**' effect. The same mitigation would also minimise disruption of the habitat's surface water supply.

Table 4.1 GWDTE Impact Assessment

Habitat Number (NVC type)	Value of Habitat	Assessed GW* Dependency	Estimated Direct Loss of Habitat	Estimated Potential Reduction in Capture Zone	Potential Reduction in Water Quality	Overall Potential Magnitude of Change	Significance of Potential Effect	Specific Mitigation Required	Overall Residual Magnitude of Change	Significance of Residual Effect
GT37 (M23/U20)	Low	High	Slight	Moderate	Low	Low	Negligible, Not Significant	Runoff and sediment control measures; Construction pollution prevention, water quality monitoring and emergency response plan; Track drainage design; and Re-use of filtered water from settlement ponds to support habitat.	Very Low	Negligible, Not Significant
GT78 (M23)	Low	High	Slight	Slight	Low	Low	Negligible, Not Significant	Runoff and sediment control measures; Construction pollution prevention, water quality monitoring and emergency response plan; Track drainage design; and Re-use of filtered water from settlement ponds to support habitat.	Very Low	Negligible, Not Significant
GT80 (M6)	Low	High	Slight	Moderate	Medium	Medium	Slight, Not Significant	Runoff and sediment control measures; Construction pollution prevention, water quality monitoring and emergency response plan; Track drainage design; and Re-use of filtered water from settlement ponds to support habitat.	Low	Negligible, Not Significant

GT81 (U4/M23)	Low	High	Slight	Moderate	Medium	Medium	Slight, Not Significant	Runoff and sediment control measures; Construction pollution prevention, water quality monitoring and emergency response plan; Track drainage design; and Re-use of filtered water from settlement ponds to support habitat.	Low	Negligible, Not Significant
GT82 (M23/M6)	Low	High	Slight	Substantial	Medium	High	Moderate, Probably Significant	Runoff and sediment control measures; Construction pollution prevention, water quality monitoring and emergency response plan; Track drainage design; and Re-use of filtered water from settlement ponds to support habitat.	Medium	Minor, Not Significant
GT85 (MG9)	Very Low	Moderate	None	Moderate	Medium	Medium	Negligible, Not Significant	Runoff and sediment control measures; Construction pollution prevention, water quality monitoring and emergency response plan; Track drainage design; and Re-use of filtered water from settlement ponds to support habitat	Low	Negligible, Not Significant
	Very Low Low Medium High	Low Moderate High	None (0%) Slight (<10%) Moderate (10-50%) Substantial (>50%)	None (0%) Slight (<10%) Moderate (10-50%) Substantial (>50%)	Negligible Low Medium High	Very Low Low Medium High	Not Significant Probably Significant Significant		Very Low Low Medium High	Not Significant Probably Significant Significant

*GW = Groundwater

5. Conclusions

Eighty-nine potential GWDTEs have been identified on the Proposed Development site but of these only ten are considered likely to be truly groundwater dependent, and of these only six (GT37, 78, 80 - 82 and 85) lie within the SEPA LUPS-GU31 buffers in relation to the Proposed Development infrastructure. Mitigation measures have been proposed, where appropriate, to ensure that any change to their groundwater and surface water supply occurring as a result of the Proposed Development is minimised. As such, there are no significant residual effects from the Proposed Development on GWDTEs.

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Management systems

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Document revisions

No.	Details	Date

P01.01	Draft	October 2022
P01.02	Final	November 2022

Appendix A
Assessment of Groundwater Dependency of NVC Communities located within the Proposed Development

Table 1: Assessment of Groundwater Dependency of NVC Communities located within the Proposed Development

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT01	M25	Moderate	Low permeability greywacke at surface & peat	The presence of low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT02	M4/M6	None/High	Peat and low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration. In addition, the habitat is also likely to derive water from surface runoff from the Pulmulloch Burn headwaters.	Low	N/A	N/A
GT03	U6	Moderate	Peat and low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT04	M23	High	Peat and low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT05	M6	High	Peat and low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration. In addition, the habitat is also likely to derive water from surface runoff from the unnamed tributary of the Pulmulloch Burn.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT06	M23	High	Peat and low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration. In addition, the habitat is also likely to derive water from surface runoff in the Pulmulloch Burn headwaters.	Low	N/A	N/A
GT07	M4/M6	None/High	Peat and low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT08	U6	Moderate	Peat and low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT09	U6	Moderate	Peat, bedrock at surface and low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT10	M6	High	Peat and low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT11	M6	High	Peat, till, bedrock at surface & low permeability greywacke	The presence of peat, till and impermeable bedrock close to surface ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration and surface runoff within the Pulmulloch Burn.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT12	M6	High	Peat and low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT13 & GT17	M23	High	Hummocky glacial deposits, bedrock at surface & low permeability greywacke	The presence of till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration. Furthermore, the Water of Ken flows through the habitat so it is likely that it derives surface water supply from this watercourse.	Low	N/A	N/A
GT14	M25	Moderate	Peat, till, hummocky glacial deposits, bedrock at surface & low permeability greywacke & microgranodiorite	The presence of till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration. Furthermore, the western margin of the habitat is, instead, likely to derive from surface runoff in the Pulmulloch Burn.	Low	N/A	N/A
GT15	U6/U5	Moderate/None	Peat, bedrock at surface & low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT16	M23	High	Peat, till, bedrock at surface & low permeability greywacke & microgranodiorite	The presence of till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration. Furthermore, the western margin and southern portion of the habitat is, instead, likely to derive from surface runoff in the Pulmulloch Burn and its unnamed tributary.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT18	M15	Moderate	Till and low permeability greywacke	The presence of till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT19	M23	High	Till, bedrock at surface and low permeability greywacke	The presence of till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT20	M6	High	Peat, till, bedrock at surface, peat & low permeability greywacke & porphyritic microdioritic intrusion	Steep gradients within habitat area and dominantly outcropping bedrock geology indicate that surface runoff rates would be high. Some perched groundwater present in peat deposits at flat topography in the eastern portion of the habitat at Fans of Altry. Despite the presence of a dyke within the habitat, which could provide groundwater via an unconformity or weathered zone, much of the site lies upgradient of this feature. Elsewhere, the presence of till, peat and low permeability bedrock ensures that any groundwater levels are local and perched.	Low	N/A	N/A
GT21	M23	High	Peat, bedrock at surface and low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT22	M23	High	Till, bedrock at surface, peat & low permeability greywacke & porphyritic microdioritic intrusion	Steep gradients within habitat area and dominantly till and outcropping bedrock geology indicate that surface runoff rates would be high. Some perched groundwater present in peat deposits at flat topography in the eastern portion of the habitat at Fans of Altry. Despite the presence of a dyke within the habitat, which could provide groundwater via an unconformity or weathered zone, much of the site lies upgradient of this feature. Elsewhere, the presence of till, peat and low permeability bedrock ensures that any groundwater levels are local and perched. In addition, much of the habitat lies within the Altry and Small Burns, which are more likely therefore to provide surface water to the habitat.	Low	N/A	N/A
GT23	M23/M20	High/None	Till, bedrock at surface & low permeability greywacke	The presence of till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT24	M25	Moderate	Bedrock at surface, low permeability greywacke & microgranodiorite intrusion	The presence of low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with most of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT25	M23	High	Till & low permeability greywacke	The presence of till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration. Furthermore, the eastern margin of the habitat is, instead, likely to derive from surface runoff in the Water of Ken.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT26	U6/M19	Moderate/None	Peat & low permeability greywacke	Perched water system within peat deposits on flat topography at the head of a tributary to Alwhat Burn. The presence of peat ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT27 & GT28	M23	High	Low permeability greywacke at surface	Little or no superficial deposits overlying impermeable bedrock, close to summit of Brown Hill, indicating that the presence of groundwater is unlikely. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT29	U6/M17	Moderate/None	Low permeability greywacke at surface	Little or no superficial deposits overlying impermeable bedrock, near summit of Lorg Hill, indicating that the presence of groundwater is unlikely. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT30	U6	Moderate	Low permeability chert & mudstone at surface	Little or no superficial deposits overlying impermeable bedrock, on very steep topography on Lorg Hill, indicating that the presence of groundwater is unlikely. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT31	M6/M23	High	Peat & low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT32	M6	High	Peat & low permeability greywacke	The presence of peat and low permeability bedrock at the headwaters of Lorg Burn ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT33	M23	High	Peat & low permeability greywacke	The presence of peat and low permeability bedrock at the headwaters of Clashywarrant Burn ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT34	M23/U5	High/None	Peat & low permeability greywacke & mudstone at surface	The presence of peat and low permeability bedrock between Lorg and Meikledodd Hills ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT35	U6	Moderate	Peat, bedrock at surface, till & low permeability greywacke and microgranodiorite	Surface water runoff over exposed and shallow impermeable bedrock, with some perched water within localised peat deposits. The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT36	U5/M23	None/High	Peat, till, bedrock at surface & low permeability greywacke & microgranodiorite	The site lies predominantly within the Lorg Burn valley. As such, it is considered that the presence of peat, till and low permeability bedrock ensures that any groundwater levels are local and perched. Despite the presence of a dyke within the habitat, which could provide groundwater via an unconformity or weathered zone, much of the site lies upgradient of this feature. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT37	M23/U20	High/None	Bedrock at surface, till hummocky glacial deposits & low permeability mudstone, chert, greywacke & micro-granodioritic intrusions	Habitat dominated by extremely steep topography where bedrock outcrops and water runs off via the watercourses Green Cleugh Burn and the unnamed watercourse from Rough Craig at the base of Lorg Hill. Nonetheless, two faults and two dykes intersect the habitat which could also offer the pathway for a groundwater supply to the surface.	High	Yes	No
GT38	M6/M23	High	Peat, till, bedrock at surface & low permeability greywacke	The presence of peat, till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration. Furthermore, much of the supply to the habitat is, instead, likely to derive from surface runoff in the Lorg Burn.	Low	N/A	N/A
GT39	U5/M23	None/High	Peat, till, hummocky glacial deposits, some bedrock at surface & low permeability greywacke	The site lies within the Lorg Burn and Alwat Burn valley. As such, it is considered that the presence of peat, till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration and surface runoff in Alwhat and Lorg Burns.	Low	N/A	N/A
GT40	U5/M23	None/High	Peat, till, and some bedrock at surface & low permeability greywacke	The presence of till (predominantly), peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration from the higher ground on Lagower Hill.	Low	N/A	N/A
GT41	U6/U4	Moderate/None	Peat and some bedrock at surface & low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT42	U5/U6	None/Moderate	Bedrock at surface, peat & low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration from the higher ground on Lagower Hill.	Low	N/A	N/A
GT43	M23/M6	High	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within Afton Water.	Low	N/A	N/A
GT44	M17/U6	None/Moderate	Peat and low permeability bedrock Wacke formation close to ground surface	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT45	U6	Moderate	Low permeability bedrock of Wacke formation and mudstone close to ground surface	Although a fault runs through the southern margin of the site, it does not occur upgradient of the site. As such, it is unlikely to provide the main source of water as groundwater. Instead, the presence of low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT46	M17/U6	None/Moderate	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
G47	U6/M19	Moderate/None	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within the Spout Burn.	Low	N/A	N/A
G48	M17/U4	None	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched in the area forming the headwaters of the Alhang Burn. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
G49	U6/M17	Moderate/None	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
G50	M23	High	Peat, till & low permeability greywacke & microdiotie, microgranodiorite & microgabbro intrusions	Although a fault runs through the north-eastern margin of the site, it does not occur upgradient of the site. As such, it is unlikely to provide the main source of water as groundwater. Instead, the presence of low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration and surface runoff in Alwhat Burn and Afton Water.	Low	N/A	N/A
GT51	M17/U6	None/Moderate	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT52	U4/U6	None/Moderate	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT53	M23/U4	High/None	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT54	M6/M17	High/None	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT55	U6	Moderate	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT56	U6/M6	Moderate/High	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT57	U5/U6/M17	None/Moderate /None	Peat, till & low permeability Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT58	M6	High	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within the Holm Burn and Afton Water headwaters.	Low	N/A	N/A
GT59	M23	High	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within the Afton Water which flows through the centre of the habitat.	Low	N/A	N/A
GT60	M6	High	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within the Afton Water which flows through the centre of the habitat.	Low	N/A	N/A
GT61	M6/M17	High/None	Peat, hummocky glacial deposits, bedrock at surface & low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within the Holm Burn headwaters which flows through the habitat.	Low	N/A	N/A
GT62	U6	Moderate	Low permeability bedrock Wacke formation close to ground surface	The presence of low permeability bedrock outcrop ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT63	M23	High	Till & low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within the Gills Burn which flows through the centre of the habitat	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT64	U6/U4	Moderate/None	Low permeability bedrock of Wacke formation close to ground surface, with some peat present within the habitat	Although a fault is present within the habitat, most of the habitat is distal to this fault, and therefore unlikely to provide the main source of water as groundwater. Instead, the presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT65	M17/U4/U6/ M23	None/None/ Moderate/High	Peat and low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT66	M6/M23	High	Peat, bedrock at surface & low permeability Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within the Spout Burn which flows through the habitat.	Low	N/A	N/A
GT67	M6/U6	High/Moderate	Peat, bedrock at surface & low permeability Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT68	M6	High	Peat, till & low permeability Wacke formation	The presence of peat, till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within the Afton Water and unnamed tributaries from Wedder Hill which flow through the habitat.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT69	M23	High	Peat, till, hummocky glacial deposits, & low permeability Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within the Alwhat Burn which flows through the habitat.	Low	N/A	N/A
GT70	U6	Moderate	Bedrock at surface, peat & low permeability Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration. Furthermore, some of the supply to the northern part of the habitat is likely to derive from the Alwhat Burn headwaters.	Low	N/A	N/A
GT71	M23/M6	High/High	Peat & low permeability bedrock Wacke formation	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within the unnamed tributary of Alwhat Burn.	Low	N/A	N/A
GT72	U6	Moderate	Peat, bedrock at surface & low permeability greywacke, mudstone & microdioritic & micro-granodioritic intrusions	Perched water system within peat deposits. Despite the presence of watercourses (tributaries to Lorg Burn) in the eastern part of the habitat, most of habitat lies at high elevation where bedrock is close to, or at, ground surface on the double summits of Ewe Hill, and is intersected by several faults. As such, and notwithstanding the presence of peat which may contain localised perched groundwater, an element of water supply to the habitat could originate by the upflow of groundwater via faults within the habitat.	Moderate	No	No
GT73	M23/U20	High/None	Till, hummocky glacial deposits, bedrock at surface & low permeability greywacke	Despite the presence of hummocky glacial deposits, which could provide some shallow groundwater to the habitat, the site lies within the flow path of two tributaries to the Water of Ken. As such, it is considered that the majority of the supply is more likely to be coming from these surface water sources.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT74	M6	High	Till, hummocky glacial deposits & low permeability greywacke	Despite the presence of hummocky glacial deposits, which could provide some shallow groundwater to the habitat, the site lies within the flow path of two tributaries to the Water of Ken and is also situated adjacent to the Water of Ken. As such, it is considered that the majority of the supply is more likely to be coming from these surface water sources.	Low	N/A	N/A
GT75	M6	High	Till and low permeability greywacke	The presence of till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration, as well as surface runoff within the Water of Ken.	Low	N/A	N/A
GT76	U20/M25	None/Moderate	Till, hummocky glacial deposits & low permeability greywacke & microgranodiorite	Notwithstanding the presence of till and low permeability bedrock, which may contain localised perched groundwater, an element of water supply to the habitat could originate by the upflow of groundwater via igneous intrusions within the habitat, or from more permeable hummocky glacial deposits.	Moderate	No	No
GT77	U5/M2375	High/None	Bedrock at surface, peat, hummocky glacial deposits & low permeability mudstone, greywacke & microdioritic & micro-granodioritic intrusions	Habitat dominated by steep topography incorporating the double summits of Ewe Hill where bedrock outcrops and water runs off via the watercourses Rough Cleugh and Small Cleugh into Lorg Burn which is located at the base of Ewe Hill. Nonetheless, numerous faults and dykes intersect the habitat which could also offer the pathway for a groundwater supply to the surface.	High	No	No

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT78	M23	High	Peat, till, hummocky glacial deposits, some bedrock at surface & low permeability greywacke, chert & mudstone & microgranodiorite	Habitat dominated by steep topography with numerous faults running through the site. The site lies within the Lorg Burn and Alwhat Burn valleys. As such, it is considered that the presence of peat, till and low permeability bedrock ensures that groundwater levels are generally local and perched. However, a groundwater contribution to the habitat cannot be discounted given the prevalence of faulted geology within the site which may also offer the pathway for a groundwater supply to the surface.	High	Yes	No
GT79	M6	High	Hummocky glacial deposits & low permeability greywacke & mudstone	In an area of flat topography, localised shallow groundwater may be present as a result of recent recharge, occurring at the interface between outcropping bedrock and glacial deposits on Lorg Hill via intergranular flow.	High	No	No
GT80	M6	High	Hummocky glacial deposits & low permeability Wacke formation	In an area of flat topography, localised shallow groundwater may be present as a result of recent recharge, occurring at the interface between outcropping bedrock and glacial deposits on Lorg Hill via intergranular flow.	High	Yes	No
GT81	U4/M23	None/High	Hummocky glacial deposits, bedrock at surface & low permeability greywacke, mudstone & microgranodiorite	In an area of flat topography, localised shallow groundwater may be present as a result of recent recharge, occurring at the interface between outcropping bedrock and glacial deposits on Lorg Hill via intergranular flow. Additionally, a dyke intersects the habitat which could also offer the pathway for a groundwater supply to the surface.	High	Yes	No
GT82	M23/M6	High	Hummocky glacial deposits & low permeability Wacke formation	In an area of flat topography, localised shallow groundwater may be present as a result of recent recharge, occurring at the interface between outcropping bedrock and glacial deposits on Lorg Hill via intergranular flow.	High	Yes	No

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT83 & GT84	M23	High	Till, hummocky glacial deposits, alluvium, & low permeability greywacke	Notwithstanding the presence of till and low permeability bedrock at, or close to, ground surface, the presence of more permeable glacial deposits and alluvium along the Lorg Burn and Water of Ken is likely to offer some opportunity for recharge to this superficial aquifer. Nonetheless, a large portion of the habitat lies upgradient from the alluvium, and a significant portion of water supplying this habitat is likely to be sourced instead from surface runoff and direct through-flow from the Water of Ken and Lorg Burn.	Low	N/A	N/A
GT85	MG9	Moderate	Till, alluvium & low permeability greywacke	Notwithstanding the presence of till and low permeability bedrock at, or close to, ground surface, as well as surface water inputs from direct through-flow within the Water of Ken, the presence of more permeable alluvial deposits along the Water of Ken is likely to offer some opportunity for recharge to this superficial aquifer.	Moderate	Yes	No
GT86	U5/U6	None/Moderate	Peat & low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT87	M6	High	Peat, till & low permeability greywacke	The presence of peat, till and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A
GT88	M6	High	Peat & low permeability greywacke	The presence of peat and low permeability bedrock ensures that any groundwater levels are local and perched. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration. Furthermore, much of the supply to the habitat is, instead, likely to derive from surface runoff in the Alhang Burn, Afton Water and an unnamed tributary which flow through it.	Low	N/A	N/A

GWDTE No.	NVC Community	Potential GW Dependency	Geology	Evaluation of Groundwater Dependence	Assessed GW Dependency	Within 100m of a track or compound?	Within 250m of a turbine or borrow pit?
GT89	M23	High	Low permeability greywacke bedrock close to surface	Little or no superficial deposits overlying impermeable bedrock, on steep topography in Spout Burn valley, indicating that the presence of groundwater is unlikely. Therefore, wider-scale groundwater supply to the habitat is limited, with the majority of the supply coming instead from surface or very near-surface runoff/infiltration.	Low	N/A	N/A