Appendix 8.6: Private Water Supply Assessment

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1 Introduction

This Private Water Supply (PWS) Assessment is an Appendix to **Chapter 8: Hydrology, Geology, Hydrogeology and Peat** and has been prepared by Fluid Environmental Consulting (Fluid) on behalf of the Applicant to support the Environmental Impact Assessment (EIA) for Lynemore Wind Farm (the 'Proposed Development'). The Site (**Figure 8.1: Hydrological Setting** of the EIA Report) is The site is located within the Dalmagarry Estate on the hills 2 km west of the A9 at Moy within the Highland Council area. Access to the proposed development site is proposed from the A9 via upgraded and new junction and access tracks via Lyneberg Road.

The Proposed Development will comprise 14 wind turbines, with a blade tip height of up to 200 m, Battery Energy Storage, associated infrastructure and ancillary development. The total installed capacity of the Proposed Development is expected to be over 50 MW.

This assessment covers an area including the Site of the Proposed Development and a surrounding ~2km buffer area (**Figure 8.6.1: Private Water Supply Overview**) where hydrological connectivity to the Site is possible. This is referred to as the PWS study area.

1.1 Environmental Context

The Site is mostly open moorland, managed primarily for stalking and grouse shooting. The named hill of Carn na h-Easgainn (616m) is located within the southern edge of the site boundary. Areas of open deciduous woodland and commercial plantation lie to the north of the Site. The Farr/ Glen Kyllachy Wind Farm complex lies approximately 2km to the southwest of the Site.

The Site is mostly underlain by relatively impermeable bedrock overlain by relative impermeable glacial till and peat drift deposits and more permeable localised alluvial deposits area associated with larger watercourses.

The majority of the Site drains to the north-east via four watercourses and their tributaries, which discharge to Loch Moy either directly or via its tributary Allt Creag Bheithin. Loch Moy flows to Funtack Burn, which joins the River Findhorn 4 km to the east of the Site near Milton of Moy. A very small area in the west of the Site drains north-west to Allt na Fuar-ghlaic, which in turn drains to the River Nairn 5 km north-west of the Site.

There is a Surface Water DWPA 4.4 km south-east of the site boundary, located from north-east of Dalmigavie Lodge to Tomatin along the River Findhorn and its tributaries.

Due to the rural nature of the Site, many of the more isolated properties are not likely to be on mains water supply, particularly where they are located at higher elevations or away from the main public roads, and therefore are likely to be reliant on private water supplies.

1.2 Scope of Works

The purpose of this PWS Assessment is to:

- Identify any properties and their associated water supplies that could have a hydrological or hydrogeological link to the Proposed Development;

- Obtain specific information on water supply sources, conveyance and storage infrastructure that could potentially be connected to the Site;
- Ascertain the risk to any of these PWS as a result of construction and operation of the Proposed Development;
- Use these details to inform the layout design; and
- Where appropriate, provide recommendations for potential mitigation measures.

1.3 Limitations

The information presented in this document is based on the list of properties provided by The Highland Council (THC) that have registered PWSs, a review of Ordnance Survey (OS) and aerial imagery mapping, questionnaire responses and site visits undertaken in January 2025.

It should be noted that additional properties which are not on the Local Authority registers were identified in the completion of this assessment and property names and supply sources updated based on the questionnaires and site visits. It is possible that additional new supplies or property name changes could have occurred since the January 2025 survey and not all residents were willing to either respond to the questionnaire or permit access. However, this assessment is considered to be as accurate as possible at this stage.

1.4 Legislation, Policy and Guidance

The main legislative drivers, relevant to the assessment are:

- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017[1]:
    - The regulations aim to ensure the provision of clean, safe drinking water and to deliver significant health benefits to those using Type A private water supplies; and
    - It is the responsibility of the Local Authorities to enforce and regulate private water supplies.
- The Private Water Supplies (Scotland) Regulations 2006[2]:
    - The regulations aim to ensure the provision of clean, safe drinking water and to deliver significant health benefits to those using private water supplies (Type B supplies); and
    - It is the responsibility of the Local Authorities to enforce and regulate private water supplies.
- The Water Quality (Scotland) Regulations 2010[3]:

[1] Available online: https://www.legislation.gov.uk/ssi/2017/282/contents/made . [accessed December 2024]
[2] Available online: https://www.legislation.gov.uk/ssi/2006/209/contents/made. [accessed December 2024]
[3] Available online: https://www.legislation.gov.uk/ssi/2010/95/contents/made. [accessed December 2024]

- These regulations relate to managing water quality failures on a private water supply, attributable to the domestic distribution or its maintenance, in premises where water is supplied to the public.

- Scottish Environment Protection Agency (SEPA), Land Use Planning Guidance Note 31[4]:
    - SEPA guidance on how excavations should be considered to support planning applications;
    - Guidance requires quantitative assessments for groundwater abstractions within 100 m of excavations up to 1m depth and within 250 m of excavations greater than 1m depth; and
    - Whilst specific to planning phase, guidance is a useful tool to help assess risk to groundwater abstractions.

2 Methodology

The PWS Assessment has been undertaken based on the following methodology:

- Consultation with SEPA, Scottish Water, The Highland Council (THC) to gather and review existing records of water supply sources within the vicinity of the proposed development;
- Completion of a high-level desktop assessment to put the hydrological and hydrogeological setting of the Proposed Development into context;
- Initiate contact with residents via the submission of a questionnaire to confirm the location and nature of their supply;
- Completion of an initial assessment of the information provided in response to the questionnaires in order to screen out supplies that are considered unlikely to be affected by the Proposed Development through lack of hydrological and hydrogeological connectivity;
- Completion of site visits of properties closest to the Proposed Development where data gaps were identified, where confirmation was required for locations of supply sources or where residents had requested a visit.

2.1 Desk Based Assessment

The desk-based assessment reviewed information from several secondary sources to build up a hydrological and hydrogeological context for the Proposed Development and the surrounding area. These included:

- Geological and hydrogeological information obtained from The British Geological Survey to understand hydrogeological conditions throughout the area considered for assessment; and

[4] SEPA (2017) Land Use Planning System, Guidance Note 31., *Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems*

- Mapping of surface water catchments and sub-catchments to determine potential hydrological connectivity to the Proposed Development.

Details of the existing site conditions can be found detailed within **Chapter 8: Hydrology, Geology, Hydrogeology and Peat** of the EIA Report.

2.1.1 Consultations

Consultations were undertaken with Scottish Water, SEPA and THC.

Scottish Water

An FOI request was submitted to Scottish Water to gather information on any public water supply abstractions or other infrastructure within a 5km radius of the site boundary. The request included hydrological mapping and shapefiles for the site boundary to assist Scottish Water in identifying relevant infrastructure.

The requested data aimed to clarify potential interactions between the proposed development and public water supply systems, supporting the environmental impact assessment process.

Scottish Water responded on the 11th of December 2024 via email and stated:

"A review of our records indicates that there are no Scottish Water drinking water catchments or water abstraction sources, which are designated as Drinking Water Protected Areas under the Water Framework Directive, in the area that may be affected by the proposed activity."

Scottish Environment Protection Agency (SEPA)

A Freedom of Information (FOI) request was submitted to the Scottish Environmental Protection Agency (SEPA) to obtain details of any registered water abstractions within the Lynemore Wind Farm site boundary and a 5km radius of the boundary. The request specifically sought:

- **Location of the source** (surface water, groundwater, borehole, spring, etc.).
- **Type of source**.
- **Abstraction volumes**.
- **Intended use**.
- **Properties or businesses utilising the abstraction**.

SEPA provided a detailed response regarding water abstractions within an 8km radius of the Lynemore Wind Farm site boundary, focusing on both licensed and registered abstractions. Among the licensed abstractions, the following key activities were highlighted:

- **CAR-L-1010493** authorises surface water abstraction from the Allt Coash Burn, with a licensed volume of 6480m³/day at a location approximately NH 8070 2760.
- **CAR-L-1011810** permits abstraction from two sources, the Allt Na Frithe Burn and the River Findhorn, with volumes of 6144m³/day and 6000m³/day respectively, located at NH 7873 2916 and NH 7972 3031.
- **CAR-L-1106477** allows for the abstraction of a significantly higher volume of water—47,865m³/day—from Uisge Dubh, situated at NH 7155 3091.

In addition to the licensed abstractions, SEPA also shared information about registered abstractions under the Controlled Activities Regulations (CAR). These include the abstraction of less than 50m³/day from the Allt na Fuar-ghlaic, at NH 7110 3720; groundwater abstraction at Daviot Quarry, spread across two points (NH 7185 3907 and NH 7210 3916); and surface water abstraction from Moy Burn for Moy Wind Farm at NH 7694 3686.

SEPA clarified that private drinking water abstractions of 10m³/day or less are not formally recorded by SEPA, as they are regulated under General Binding Rules (GBRs). This limitation suggests that such abstractions would require verification through local authority records, specifically those held by the Highland Council. SEPA also noted that, for public safety reasons, they do not disclose the locations of public drinking water supply abstractions.

The data provided by SEPA reflects their best available information, but they cautioned that some records may be incomplete due to the impact of the 2020 cyber-attack on their systems. As such, the response highlights the importance of cross-referencing SEPA's data with other sources, such as local authority records, to ensure a comprehensive understanding of water abstractions in the area.

SEPA's data review confirms that none of these abstractions will be impacted by the Lynemore Wind Farm scheme. The licensed and registered abstractions are located at sufficient distances from the site boundary to be unaffected by construction or operational activities. Furthermore, the diffuse and localised nature of hydrological changes anticipated from the development, coupled with the abstraction points' upstream or distant positions relative to the site, ensures no measurable impact on theses identified abstractions.

The Highland Council (THC)

The Highland Council provided information regarding private water supplies (PWS) within a 4km radius of the proposed Lynemore Wind Farm site. A key supply, PWS Lynebeg, is registered within the designated area and is recorded as a domestic supply. However, this supply has not undergone recent monitoring or inspection, and the Council is currently reviewing its register to ensure accurate classification of all supplies.

The register was reviewed, and the following addresses were identified as potentially at risk, so they were visited during the site visit for in-person questionnaires:

1. **PWS Lynebeg**
   The addresses associated with this supply are 1, 2, 3, and 4 Lynebeg Cottage and Foresters House.
2. **Keepers Cottage**
3. **Lynemore Cottage**

The provided data included addresses but did not include detailed information on the sources of these supplies. Some records lack linked properties, reflecting historical gaps in the register. The Council also noted that there might be unnotified supplies not captured in their data.

Additionally, the response highlighted the importance of compliance with Regulation 31 of the Private Water Supplies (Scotland) Regulations 2006. Any proposed development must not risk contamination, deteriorate water quality, or negatively impact water catchments serving PWS. Spatial data for PWS is accessible through the Highland Council's Open Data Portal under the Open Government Licence.

Desk Based Review

Data provided by THC was reviewed, together with OS mapping and aerial imagery to identify properties potentially reliant on private water supplies within the potential catchments of the Site and any potential data gaps where further investigation was required.

2.1.2 Private Water Supply Assessment

A site visit was carried out on 15 January 2025 to confirm the status of each property, supplemented by follow-up correspondence where necessary. Questionnaires were conducted with property occupants where possible. The findings are summarised below:

- **1, 2, 3, and 4 Lynebeg Cottages**: These properties are now on mains water supply and no longer rely on PWS.
- **Keeper's Cottage**: This property is also connected to mains water and does not utilise a PWS.
- **Lynemore Cottage**: Lynemore Cottage was confirmed to be reliant on a PWS. The source was visited and identified as a storage chamber located approximately 300m to the south of the property, on a hill. The topography of the hill separates the source from the proposed construction activities, which will occur on the opposite side of the hill. Additionally, the catchment for the source is distinct from the area where construction is planned. A watercourse to the west further separates the source from any potential construction impacts. These factors indicate that the PWS at Lynemore Cottage will not be affected by the development. The source location and its separation from construction activities are shown in **Figure 8.6.1.**
- **Foresters House**: The occupant of Foresters House confirmed reliance on a PWS, although the exact source location is unknown. Based on discussions during the site visit, the source is thought to be in proximity to Lynemore Cottage's PWS source. Given the same factors of separation (i.e., the topographic divide, distinct catchment areas, and the presence of the watercourse), the PWS at Foresters House is also not considered at risk of being affected by the development. The indicative location of the source is shown in **Figure 8.6.1**.

2.1.3 Questionnaires

Questionnaires were carried out at properties of concern during the site visit in January 2025.

This process involved carrying out an in-person questionnaire to obtain information regarding their supply:

- The brief questionnaire asked residents to provide details on their supply;
- The questionnaire also included contact details for further consultation or to arrange property visit appointments.

An example of the PWS questionnaire is provided in **Annex III**.

2.2 Site Visits

A site visit was carried out in January 2025 to visit the properties identified as potentially using a PWS.

Where possible, the locations of the PWS source were viewed, photographed and an accurate GPS grid reference was taken. Information was also gathered on the water supply system, such as tanks, pipelines, treatment systems and quantity and quality from the residents where relevant. Much of this detail is not provided within this report as it is only relevant where supplies are connected to the Proposed Development.

Site visits and anecdotal information confirmed that:

- Lynemore Cottage and the Forester's House have a PWS for potable use; and
- 1, 2, 3, and 4 Lynebeg Cottages along with the Keeper's Cottage are on mains water supply for potable water supply and therefore have not been assessed further.

2.3 Risk Assessment Method

A methodology for risk assessment of private water supplies is contained within the Private Water Supplies Technical Manual. Due to the nature of the works being carried out for the Proposed Development, it was deemed impractical to use the methodologies set out in this guidance as this would have required taking into account factors such as: proximity of the supply to cattle and wildlife, historical and current land use and historical maintenance carried out on the supply. While such factors will be important for determining the baseline qualities of the supply, they are inappropriate for determining the risk to the private water supplies posed from the construction and operation of the Proposed Development.

The methodology adopted is based on Fluid Environmental Consulting's extensive experience of assessing risks to PWS from wind farm developments, however, the guidance has been utilised where possible when trying to establish the varying factors which influence the baseline conditions of the supplies.

The risk assessment considered the type of hazard associated with the Proposed Development, release and exposure potential and severity of impact.

The Source-Pathway-Receptor conceptual model has been used as the underlying transfer mechanism to assess the risk posed by the construction and operational activities. In this model:

- **Source** - refers to the source of the potential risk hazard;
- **Pathway** - refers to the mechanisms by which the hazard is transmitted to the receptor; and
- **Receptor** - refers to anything or anyone that could be adversely affected by the hazard (including supply source and associated infrastructure).

Where hydrological connectivity or linkage exists between a potential contamination source and the receptor by means of a pathway, then a pollutant linkage and associated risk exists. Where there is no pollutant linkage, for example a PWS source is not within a catchment of the Proposed Development, there will be no associated risk. This screening allows the assessment to focus on supplies that are hydrological or hydrogeologically connected to the Proposed Development.

The hydrogeological ‘catchment areas’ are likely to be similar to the surface water catchments and therefore bound by the same topographical restrictions. The methodologies for this qualitative assessment are based on a worst-case scenario and try to determine the greatest possible impact the development will have on the quality and quantity of water serving the supply. As the direction of groundwater flow cannot be accurately assessed without detailed site investigations, it is assumed that the groundwater flow is in the direction of each supply source based on the topographical and hydrogeological regime.

The risks to the hydrological and hydrogeological environment during construction vary based on the location of each source and how that source is fed i.e. groundwater spring, borehole or surface water abstractions. As a result, the assessment of risk of contamination to PWS due to activities associated with the construction works will consider the following:

- Type of private water supply and likely disruption potential;
- Distance from water source and known supply infrastructure to the nearest point of construction associated with the Proposed Development; and,
- Position of the source in relation to the construction works in terms of topography and catchment influence zones.

The risk assessment considers the type of hazard associated with the Proposed Development, the probability or likelihood and severity or magnitude of an impact occurring, based on topographical and hydrological relationships between the supply. This is consistent with the assessment of significance as detailed within **Chapter 8** of the EIA Report.

3 Risk Assessment

3.1 Receptors

The receptors refer to anything or anyone that could be adversely affected by the hazard (including supply source and associated infrastructure).

The majority of the PWS are used for domestic supply, including potable drinking water supply, some are used for small scale commercial purposes and livestock. It is understood that not all properties with a domestic water supply choose to drink the water and used bottle water supply for drinking water.

As a conservative approach it is assumed that all identified PWS are used for domestic potable supply (drinking water) as they have a right to access the water supply for this purpose and human consumption is the most sensitive receptor category.

3.2 Screening of Supplies

The initial desk-based review of potential properties reliant on PWSs identified 7 properties that could have PWSs potentially linked to the Site.

Following the questionnaire responses and site visits this was reduced down to 2 properties, due to the other 5 properties being supplied by mains.

A screening assessment was then completed on the remaining 2 properties following receipt of the information provided by the residents both from questionnaires and site visits. The screening was based on the source of the PWS in relation to the disturbed areas that would be associated with the Proposed Development in order to eliminate any sources that would not be hydrologically or hydrogeologically connected.

The screening exercise excluded properties where inconceivable hydrological or hydrogeological connectivity is likely to exist. These were determined through considering the following:

- Catchment boundaries and channel networks;
- Properties of the underlying superficial and bedrock geology;
- Dominant land use;
- Topographical considerations; and,
- Proximity to Proposed Development infrastructure (100m where excavations will be less than 1m depth and 250m where excavations will be greater than 1m depth buffers for groundwater sources).

The locations of the PWS sources and their associated catchments based on the topography and the hydrogeological regimes are shown on **Figure 8.6.1** and detailed and screened in **Table 1** in **Annex I.**

3.3 Risk Assessment of PWS Potentially Connected to the Proposed Development

All identified PWS sources are located outside the surface water catchments associated with the Proposed Development infrastructure, or are separated from development areas by surface water features. As there is no hydrogeological connection between the identified PWS sources and the proposed construction activities, they have been scoped out of the assessment, and no significant impacts are anticipated.

4 Conclusion

Given the rural nature of the Site, reliance on private water supplies (PWS) was anticipated. To assess this, private water supply records were obtained from The Highland Council (THC) and reviewed alongside Ordnance Survey (OS) mapping and aerial imagery to identify properties potentially dependent on PWS connected to the Site.

A figure illustrating the locations of these PWS and their indicative catchments is provided in **Figure 8.6.1**.

All identified PWS sources and associated infrastructure are located:

- More than 100m from proposed access tracks requiring excavations of less than 1m depth.
- More than 250m from proposed infrastructure requiring excavations deeper than 1m.

Given these distances, and the absence of hydrological connectivity between the PWS sources and the Proposed Development footprint, no significant impacts are anticipated. As a result, further assessment of PWS within the EIA Report is not required.

Annex I

Private Water Supply Consultation and Site Visit Screening Summary

Table 1 Private Water Supply Consultation and Site Visit Screening Summary

PWS source ID	Property Name	PWS Source Type	PWS Source Location Grid Reference		Within Proposed Development Site Boundary	Potentially Connected to Infrastructure	Justification – Hydrogeological Regime	Comments on Supply
			Easting	Northing				
1	Lynemore Cottage	Spring-fed or shallow groundwater supply	276274	833608	Yes	No	The source is located on the far side of a hill from the construction area, within a separate catchment and further buffered by a watercourse. Due to this natural separation, the PWS is not at risk from the development and has been excluded from further investigation. Located over 250m from nearest Proposed Development Infrastructure.	Used for all domestic uses including potable supply. Property and source visited.
2	Forester's House	Spring-fed or shallow groundwater supply (suspected)	Unknown	Unknown	Yes	No	The source is thought to be located on the far side of a hill from the construction area, within a separate catchment and further buffered by a watercourse. Due to this natural separation, the PWS is not at risk from the development and has been excluded from further investigation. Located over 250m from nearest Proposed Development Infrastructure.	Used for all domestic uses including potable supply. Property visited. Thought to be in the same area as Lynemore Cottage source.

Annex II

Example of Private Water Supply Questionnaire

Private Water Supply Questionnaire

1. Do you receive water from a private water supply (PWS)? Yes / No

2. Is the location of this PWS on land owned or occupied by you? Yes / No

   If you are a tenant, please give name and address of the owner:

3. What is the location of the PWS? (please supply a grid reference if you know it, or indicate on the attached map if preferred)

4. What sort of supply is it? (e.g., borehole/well, collection facility)

5. Is the source of the supply:

   groundwater

   surface water

   a spring (please tick one)

6. If there is a borehole/well:

   How deep is it and what is its diameter?

   When was it installed?

7. If there is a collection facility please give details of any drains feeding the collection tank.

8. Please provide details of any pumps used.

9. Please provide any other information about the source of the water or nature of the collection facility not covered above.

10. Do you have facilities for storing water and to what capacity?

11. Does the supply have seasonal variation in flow and has it been known to dry up? Please provide details.

12. Does the water undergo any form of treatment? (e.g., filter, UV, ozone, chlorination)

13. Please provide details of any maintenance or inspection routines carried out on the supply?

14. Do you maintain any water quality records and have there ever been any problems with the quality or clarity of the water?

15. What is the water used for (e.g. drinking water, house supply, livestock, irrigation), and how much water is required for each different usage?

16. Please list any other properties, if any, which also use this PWS.

17. Please give any details you know of other PWS in the area.

18. Please give any further information not covered in this questionnaire that might help in this investigation (continue on a separate sheet if necessary).

Name: Date:

Address: Tel No:

The information provided in this questionnaire will be used solely for the purposes of the Lynemore Wind Farm water supply assessment and will be treated with confidentiality.