Technical Appendix 8.6: Private Water Supply Risk Assessment (PWSRA)

Glentarken Wind Farm

SSE Renewable

Prepared by:

SLR Consulting Limited

No. 50 Stirling Business Centre, Wellgreen, Stirling, FK8 2DZ

SLR Project No.: 405.065137.00001

9 October 2024

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	9 October 2024	K. Rainford	B. Dunlop	G. Robb

Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with SSE Renewable (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

SLR shall not be liable for the use of or reliance on any information, advice, recommendations and opinions in this document for any purpose by any person other than the Client. Reliance may be granted to a third party only in the event that SLR and the third party have executed a reliance agreement or collateral warranty.

Information reported herein may be based on the interpretation of public domain data collected by SLR, and/or information supplied by the Client and/or its other advisors and associates. These data have been accepted in good faith as being accurate and valid.

The copyright and intellectual property in all drawings, reports, specifications, bills of quantities, calculations and other information set out in this report remain vested in SLR unless the terms of appointment state otherwise.

This document may contain information of a specialised and/or highly technical nature and the Client is advised to seek clarification on any elements which may be unclear to it.

Information, advice, recommendations and opinions in this document should only be relied upon in the context of the whole document and any documents referenced explicitly herein and should then only be used within the context of the appointment.

Table of Contents

Basis of Report ..... **i**
1.0 Introduction **1**
2.0 Private Water Supply Risk Assessment **2**
3.0 Example Monitoring Protocol and Intervention Strategy **5**
3.1 Monitoring and Reporting Personnel 6
3.2 Monitoring Methodology 6
3.3 Example Intervention Strategy 6
3.3.1 Alerting Potentially Affected Properties 6
3.4 Provision of Alternative Water Supplies 6

Tables in Text

Table 1: Private Water Supply Risk Assessment 2
Table 2: Example Monitoring Protocol 5

Figures

Figure 8.6.1: Private Water Supply Risk Assessment

1.0 Introduction

SLR Consulting Ltd (SLR) was commissioned by SSE Renewables SSE Renewables Services Ltd ('the agent) on behalf of SSE Generation Ltd (the 'Applicant'), to undertake a Private Water Supply (PWS) Risk Assessment for the proposed Glentarken Wind Farm (the Proposed Development).

This Technical Appendix (TA) should be read in conjunction with **Chapter 8: Geology, Peat, Hydrology and Hydrogeology (EIAR Volume 1)** which contains a detailed description of the local hydrology and hydrogeology, flow mechanisms and hydraulic properties of the soils and geology, the embedded mitigation incorporated in the development design, and an assessment of impacts on groundwater and surface water flows and quality.

It considers the potential effects of the Proposed Development on the quality and quantity of water at the private water supply (PWS) sources within the Study Area which comprises a buffer of 500 m from the Site. To complete the assessment a conceptual site model is presented which uses a source-pathway-receptor linkage to assess the risk to each PWS. Where necessary mitigation is proposed.

Following consultation with Stirling Council (SC) and Perth and Kinross Council (PKC) data was received for PWS sources within the Study Area. This data was then augmented with Ordnance Survey mapping and aerial photography. Additional properties, and potential water users, were also identified following a programme of site-specific field investigation that involved visiting the properties, enquiring about their water use and source, and mapping water abstraction locations.

The location of water sources (boreholes, springs, surface abstractions) and holding tanks etc. were recorded using a handheld GPS. When residents were unavailable on the day that the survey was conducted, questionnaires were left at properties requesting details of their water source or PWS.

The field investigation was completed in July 2024 by the author of this report. The results of the PWS survey and assessment are presented in Section 2 of this report.

The location of PWS sources is shown on **Figure 8.6.1** appended.

Section 3 of this report gives detail of a potential water monitoring schedule and parameter list that could be used to monitor water quality at receptors that have a hydraulic linkage (e.g. flow pathway) to the Proposed Development. The monitoring frequency, parameter list and reporting programme would be subject to agreement with SC, PKC and the Scottish Environment Protection Agency (SEPA) should consent be granted, and it is anticipated would be secured by an appropriately worded pre-commencement planning condition.

2.0 Private Water Supply Risk Assessment

Table 1 presents information collected from the PWS survey, returned questionnaires, public consultation events, SC, PKC, and desk study. If a source is assessed to have a hydraulic connection (e.g. there is a flow pathway) to the Proposed Development, mitigation measures have been proposed.

The risk assessment has been completed with reference to SEPA's LUPS-31 guidance[1].

The findings from Table 1 can be summarised as follows:

- one confirmed PWS source is potentially at risk from the Proposed Development;
- the distribution pipework associated with one PWS is potentially at risk from the Proposed Development; and
- two properties are not considered to be at risk from the Proposed Development.

Table 1: Private Water Supply Risk Assessment

PWS ID (Figure 9.4.1)	Property Name	Data Source and PWS Source Type	Location of PWS Source and Distance from Proposed Development	Details	Potential Complete Source – Pathway – Receptor Linkage	Mitigation and Monitoring
PWS01	Drummond Estate Woodend Cottage Ardveich House	Site Visit Stream	E 262068 / N 724663 Approximately 60 m north east of the proposed access track.	Residents confirmed that the properties, workshop and larder, fish farm and caravan site are supplied by a stream abstraction. Water is sourced from a tributary of the Beich Burn. Water is diverted from the burn approximately 1 km north of the abstraction point, via a man made ditch. Water is collected in four holding tanks (which are located at E 262037 / N 724659, approximately 30 m west of the abstraction point),	✓ Distribution pipework only.	Water distribution pipework to be clearly marked and protected.

[1] SEPA (2017) Land Use Planning System, SEPA Guidance Note 31, Guidance on Assessing the Impacts on Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems, Version 3

PWS ID (Figure 9.4.1)	Property Name	Data Source and PWS Source Type	Location of PWS Source and Distance from Proposed Development	Details	Potential Complete Source – Pathway – Receptor Linkage	Mitigation and Monitoring
				before it is gravity fed to the properties. No development is located upstream of the PWS source however the distribution pipework will be crossed by the proposed access track.		
PWS02	Dalveich Cottage Holiday Let	Site Visit Spring	E 261058 / N 724396 Approximately 1 km west of the proposed access track.	Residents confirmed that the property is supplied by a spring fed source which is located approximately 400 m north west of the property. No development is located upstream nor within 250 m of the spring. The distribution pipework will also not be affected by the Proposed Development. Therefore, the PWS is not considered to be at risk.	× PWS source and pipework not considered to be at risk.	None.
PWS03	Glenbeich Lodge Keepers Cottage Larch Cottage	Site Visit Spring	E 261134 / N 725151 Approximately 750 m west of the proposed access track.	Residents confirmed that the property is supplied by a spring fed source which is located between 500 m and 570 m north west of the properties. Water is diverted to two holding tanks (located at E 261418 / N 725058, approximately 300 m south east of the spring) before it is gravity fed to the properties. No development is located upstream nor within 250 m of the spring. The distribution pipework will also not be affected by the Proposed	× PWS source and pipework not considered to be at risk.	None.

PWS ID (Figure 9.4.1)	Property Name	Data Source and PWS Source Type	Location of PWS Source and Distance from Proposed Development	Details	Potential Complete Source – Pathway – Receptor Linkage	Mitigation and Monitoring
				Development. Therefore, the PWS is not considered to be at risk.		
PWS04	Woodhouse Farm Glentarken Hydro Scheme	Site Visit Stream	E 266640 / N 725946 Approximately 2.1 km south west of turbine T8.	The landowner has confirmed that the property is supplied by a stream abstraction, which also supplies the local Glentarken hydro scheme. The PWS takes water from the Glentarken Burn (also called Tarken Burn). The abstraction is located downstream of the Proposed Development which includes 6 turbines. It is therefore considered that the PWS source is potentially at risk from the Proposed Development. No development is proposed between the source and the property, so the distribution pipework is unlikely to be affected.	✓ PWS source potentially at risk	It is recommended that the PWS source location is confirmed prior to construction. Controls will be required to safeguard the PWS from the Proposed Development to ensure the stream source quality and quantity is not impaired. Baseline and confirmatory water quality monitoring should be undertaken to assess the efficacy of these controls (see Section 3).

3.0 Example Monitoring Protocol and Intervention Strategy

Pre-development monitoring data can be used to establish baseline water levels and quality and assessment or trigger values against which routine monitoring data collected during construction can be compared.

The monitoring suite, monitoring locations, monitoring frequency and intervention strategy would be agreed with SC, PKC and SEPA prior to any works being undertaken. It is anticipated that this would be secured by an appropriately worded pre-commencement planning condition agreed between the Applicant, ABC and SEPA. Table 2 however, shows an example protocol which could be used as a basis to agree a water monitoring protocol with relevant consultees.

Table 2: Example Monitoring Protocol

Location	Frequency	Determinant Suite
• PWS04 • Main watercourses which drain from the Site (locations to be confirmed)	Monthly prior to and during construction	Field Sampling • pH • Redox • Conductivity • Dissolved Oxygen • Water Level Extractive Samples • pH • Alkalinity (total and bicarbonate) • Suspended solids • Colour • Organic carbon (total and dissolved) • Electrical conductivity • Chloride • Orthophosphate • Sulphate • Nitrate, nitrite and ammonium • Hydrocarbons • Aluminium (total + dissolved) • Calcium (total + dissolved) • Iron (total + dissolved) • Copper (total + dissolved) • Magnesium (total + dissolved) • Manganese (total + dissolved) • Potassium (total + dissolved) • Sodium (total + dissolved) • BOD • COD • TON • Bicarbonate • Ammoniacal nitrogen

Location	Frequency	Determinant Suite
		• Total Coliforms (PWS only) • E Coli (PWS only) • Enterococci (PWS only)

* Monitoring locations, suite, and frequency to be agreed with Statutory Consultees

3.1 Monitoring and Reporting Personnel

The monitoring and reporting would be undertaken by appropriately experienced and trained staff.

3.2 Monitoring Methodology

Water samples would be collected following guidance within SEPA's "Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water" (specifically Section 9 thereof).

Prevailing weather conditions, qualitative flow conditions as well as other visual indicators would be recorded in order to aid the sample reporting.

The water samples would be placed directly into appropriate sterile bottles, which would be labelled and dispatched to a UKAS accredited laboratory under chilled conditions and accompanied by the relevant chain of custody documentation.

3.3 Example Intervention Strategy

In the unlikely event that the routine monitoring data recorded potential pollution, an investigation and intervention strategy will be implemented. The details of this would be agreed prior to any construction and secured by an appropriately worded pre-commencement planning condition.

3.3.1 Alerting Potentially Affected Properties

Contact details (land and mobile numbers / email addresses) for PWS users would be maintained by site management at all times.

In the event that monitoring data collected at any PWS is above the baseline monitoring record and above prescribed regulatory standards then property owners would be advised and repeat water sampling undertaken (if agreed with the property owners). Property owners would be advised within 24 hours of receipt of monitoring results. Repeat water sampling would be undertaken as soon as reasonably practicable and within 72 hours.

Details of any affected property would be reported to SC or PKC within the timeframe agreed with SC or PKC when the monitoring programme was agreed and finalised.

3.4 Provision of Alternative Water Supplies

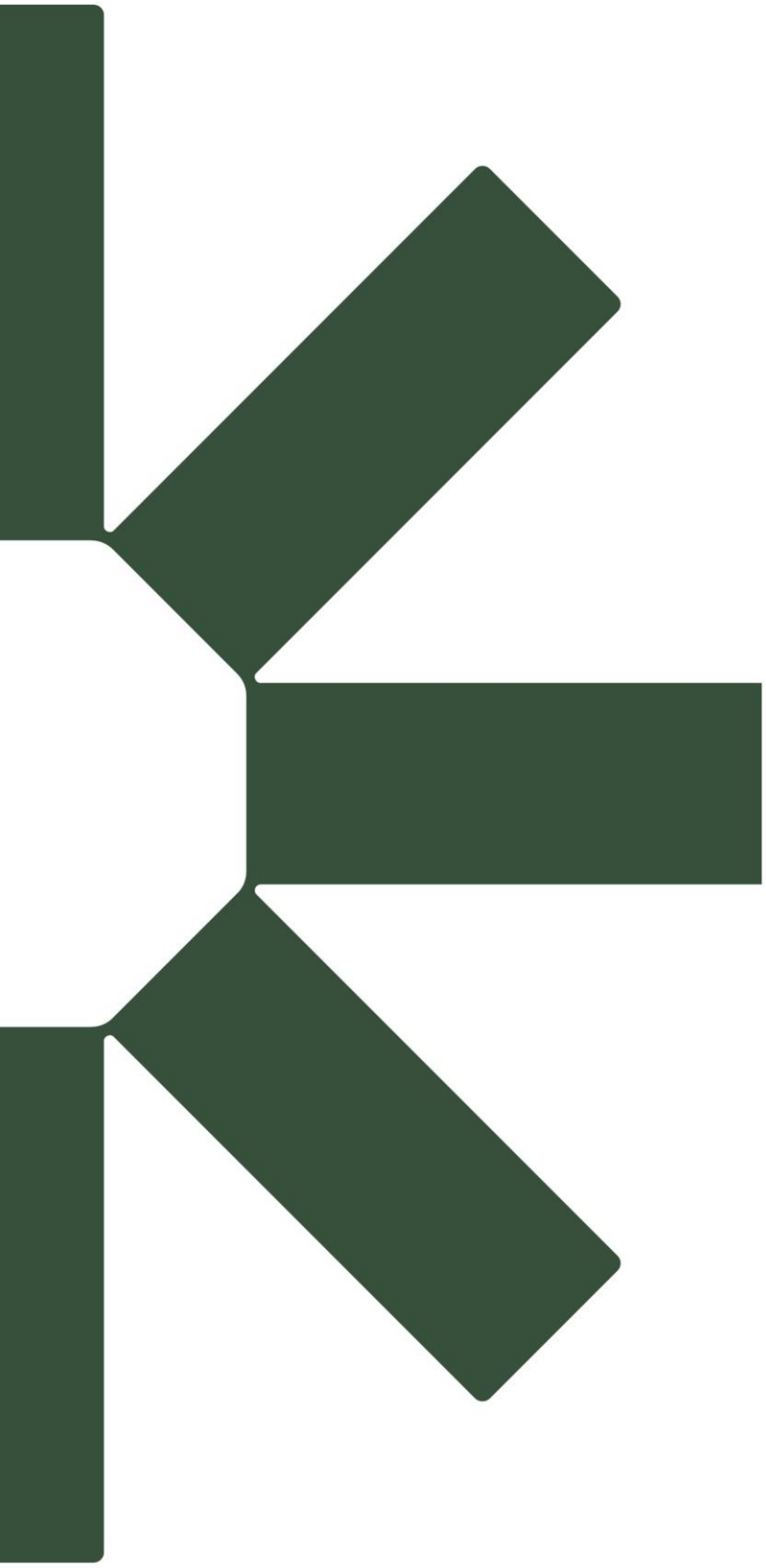
The Applicant commits to maintaining the yield and wholesomeness of water supplies.

The following measures may be deployed in the unlikely event a PWS is adversely impacted by the works:

- provision of bottled potable water in the event of a short or transient impact on a water supply (bottled water would be retained on site ready for quick dispatch to any affected property); and
- provision of an alternative water source (e.g. spring, borehole, alternative surface water abstraction location) in the event of a permanent impact of a water supply.

In the event of an alternative water source being implemented SC or PKC would be advised as soon as is practical.

Figures



Making Sustainability Happen