



Killean Wind Farm

Technical Appendix 9.3: Schedule of Watercourse Crossings

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Basis of Report

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1.0 Introduction

This Technical Appendix contains information relating to the existing and proposed new watercourse crossings at the Proposed Development.

This report presents photographs and dimensions for each crossing point. The report also details the likely form of the track crossing solution (e.g., culvert, arch culvert, or bridge), however, the final design of each crossing solution would be agreed with Scottish Environment Protection Agency (SEPA) prior to construction and be determined as part of the detailed site design.

A survey of the proposed watercourse crossings was undertaken in February and March 2024 by experienced SLR hydrologists.

The location of the watercourse crossings is shown in Figure 9.1 (Local Hydrology) of Chapter 9: Geology, Hydrology and Hydrogeological Assessment of the EIA Report.

1.1 Relevant Legislation

The Water Framework Directive (2000/60/EC) (WFD) has been transposed into Scottish legislation as the Water Environment and Water Services (Scotland) Act 2003 (or WEWS) and has given Scottish ministers powers to introduce regulatory controls over activities in order to protect and improve Scotland's water environment. The water environment includes wetlands, rivers, lochs, transitional waters (estuaries), coastal waters and groundwater. These regulatory controls, known as the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) came into force in 2011 and have since been amended in 2013, 2017, and 2021.

With respect to watercourse crossings, CAR requires that all engineering works in inland surface waters and wetlands are subject to authorisation and allow for proportionate risk-based regulation which is outlined in the CAR Practical Guide. The authorisation process operates at three levels:

- General Binding Rules (GBR):
 - Minor crossings with no construction on bed or banks.
- Registration:
 - Bridges across rivers and lochs where no part of the structure encroaches on the bed (e.g., no piers or in-channel supports). In addition, the total length of the structures on both banks should not be more than 20 m. This category includes bottomless arch culverts; and
 - Closed culverts used for single-track tracks, footpaths and/or cycle routes, where the affected river is not more than 2 m wide.
- Licence (Simple/Complex):
 - All other bridges, fords or causeways; and
 - This category would include bridges affecting more than 20 m total bank lengths, bridges with in-stream supports or closed culverts for crossings not specified above.



SEPA provide authorisation for watercourse crossings shown on the 1:50,000 scale Ordnance Survey (OS) maps (Landranger Series). All other watercourses are classed as "minor watercourse" and are exempt under CAR.





2.0 Watercourse Crossing Details

2.1 Existing Watercourse Crossings



The locations of existing watercourse crossings which may be upgraded as part of the Proposed Development are shown on Figure 9.1. Fourteen existing crossings (WX01 to WX14) which may be upgraded as part of the development have been identified, details of which are included below.

Watercourse Crossing ID	WX01
Watercourse Crossing Details	<p>Grid Reference: E 170074 / N 644889</p> <p>Status: Existing</p> <p>Culvert Diameter: 1m high 0.5m wide (downstream)</p> <p>Culvert Construction Type: Stone culvert (downstream)</p> <p>Watercourse Width: 0.5m (downstream)</p> <p>Watercourse Depth: 0.1m (downstream)</p> <p>Notes: Entrance of the culvert was obscured by branches. It is assumed that the culvert extends approximately 100m under the field to the south-west of the crossing and diverts water to the Killean Burn. Plastic water pipe (presumed to be PWS pipework) is noted near culvert entrance.</p>
Photograph Looking at Culvert Entrance from Upstream	
Photograph Looking at Culvert Exit from Downstream	



Watercourse Crossing ID	WX02
<p>Watercourse Crossing Details</p>	<p>Grid Reference: E 170458 / N 644818 Status: Existing Culvert Diameter: 1.2m Culvert Construction Type: Stone culvert Watercourse Width: 1.2m Watercourse Depth: 0.3m Notes: Plastic water pipe (presumed to be PWS pipework) is noted near culvert entrance.</p>
<p>Photograph Looking at Culvert Entrance from Upstream</p>	 <p>A photograph showing the upstream view of a culvert entrance. The entrance is a dark opening in a concrete wall, partially obscured by a dense thicket of dry, brown brush and some green plants. A blue plastic pipe is visible near the entrance. The background shows a concrete wall and a clear sky.</p>
<p>Photograph Looking at Culvert Exit from Downstream</p>	 <p>A photograph showing the downstream view of a culvert exit. The exit is a dark opening in a concrete wall, heavily obscured by a dense thicket of dry, brown brush and some green plants. The background shows a concrete wall and a clear sky.</p>





Watercourse Crossing ID	WX03
Watercourse Crossing Details	<p>Grid Reference: E 171157 / N 644686</p> <p>Status: Existing</p> <p>Culvert Diameter: 0.7m</p> <p>Culvert Construction Type: Concrete circular culvert</p> <p>Watercourse Width: 0.7m</p> <p>Watercourse Depth: 0.2m</p> <p>Notes: Heavily vegetated, difficult to access. Another culvert is noted approximately 15m upstream of the crossing point.</p>
Photograph Looking at Culvert Entrance from Upstream	
Photograph Looking at Culvert Exit from Downstream	



Watercourse Crossing ID	WX04
<p>Watercourse Crossing Details</p>	<p>Grid Reference: E 171313 / N 644715 Status: Existing Culvert Diameter: 0.3m Culvert Construction Type: Circular culvert Watercourse Width: 1m Watercourse Depth: 0.2m Notes: Confluence of watercourses noted immediately upstream of the crossing, including road drainage.</p>
<p>Photograph Looking at Culvert Entrance from Upstream</p>	
<p>Photograph Looking at Culvert Exit from Downstream</p>	





Watercourse Crossing ID	WX05
<p>Watercourse Crossing Details</p>	<p>Grid Reference: E 171506 / N 644740 Status: Existing Culvert Diameter: 0.3m Culvert Construction Type: Circular culvert Watercourse Width: 0.5m Watercourse Depth: 0.1m Notes: Water upstream of the crossing is fed by track drainage and runs to the north of the track, east of the crossing.</p>
<p>Photograph Looking at Culvert Entrance from Upstream</p>	
<p>Photograph Looking at Culvert Exit from Downstream</p>	





Watercourse Crossing ID	WX06
Watercourse Crossing Details	<p>Grid Reference: E 171763 / N 644864</p> <p>Status: Existing</p> <p>Culvert Diameter: 2m</p> <p>Culvert Construction Type: Corrugated metal circular culvert</p> <p>Watercourse Width: 1 to 3m</p> <p>Watercourse Depth: 0.4m</p> <p>Notes: Small weir noted upstream of the crossing.</p>
Photograph Looking at Culvert Entrance from Upstream	
Photograph Looking at Culvert Exit from Downstream	





Watercourse Crossing ID	WX07
Watercourse Crossing Details	<p>Grid Reference: E 172008 / N 645227</p> <p>Status: Existing</p> <p>Culvert Diameter: 1m</p> <p>Culvert Construction Type: Corrugated metal circular culvert reinforced with stone.</p> <p>Watercourse Width: 1.5m</p> <p>Watercourse Depth: 0.3m</p> <p>Notes: None.</p>
Photograph Looking at Culvert Entrance from Upstream	
Photograph Looking at Culvert Exit from Downstream	





Watercourse Crossing ID	WX08
Watercourse Crossing Details	<p>Grid Reference: E 172034 / N 645226</p> <p>Status: Existing</p> <p>Culvert Diameter: 0.3m</p> <p>Culvert Construction Type: Concrete circular culvert</p> <p>Watercourse Width: 0.4m</p> <p>Watercourse Depth: 0.2m</p> <p>Notes: Culvert entrance heavily vegetated.</p>
Photograph Looking at Culvert Entrance from Upstream	
Photograph Looking at Culvert Exit from Downstream	



Watercourse Crossing ID	WX09
<p>Watercourse Crossing Details</p>	<p>Grid Reference: E 172133 / N 645336 Status: Existing Culvert Diameter: 0.3m Culvert Construction Type: Concrete circular culvert Watercourse Width: 0.3m Watercourse Depth: 0.1m Notes: Immediately downstream of crossing, watercourse channel is less defined.</p>
<p>Photograph Looking at Culvert Entrance from Upstream</p>	
<p>Photograph Looking at Culvert Exit from Downstream</p>	





Watercourse Crossing ID	WX10
<p>Watercourse Crossing Details</p>	<p>Grid Reference: E 172216 / N 645377 Status: Existing Culvert Diameter: N/A Culvert Construction Type: N/A Watercourse Width: N/A Watercourse Depth: N/A Notes: Watercourse crossing shown on OS mapping but no culvert is present at this location. Channels are noted either side of the track which collect track drainage and flow to other crossing points along the track.</p>
<p>Photograph Looking at North towards Track</p>	
<p>Photograph Looking at South towards Track</p>	





Watercourse Crossing ID	WX11
<p>Watercourse Crossing Details</p>	<p>Grid Reference: E 172636 / N 644867 Status: Existing Culvert Diameter: 0.5m Culvert Construction Type: Corrugated metal circular culvert Watercourse Width: 0.2 to 1.2m Watercourse Depth: 0.2m Notes: Confluence noted immediately upstream of crossing point. Watercourse width noted wider immediately upstream and downstream of crossing.</p>
<p>Photograph Looking at Culvert Entrance from Upstream</p>	
<p>Photograph Looking at Culvert Exit from Downstream</p>	





Watercourse Crossing ID	WX12
Watercourse Crossing Details	<p>Grid Reference: E 172655 / N 644747</p> <p>Status: Existing</p> <p>Culvert Diameter: 0.3m</p> <p>Culvert Construction Type: Concrete circular pipe</p> <p>Watercourse Width: 0.3 to 1m</p> <p>Watercourse Depth: 0.2m</p> <p>Notes: Watercourse narrower upstream of crossing compared to downstream.</p>
Photograph Looking at Culvert Entrance from Upstream	
Photograph Looking at Culvert Exit from Downstream	



Watercourse Crossing ID	WX13
<p>Watercourse Crossing Details</p>	<p>Grid Reference: E 172767 / N 644623 Status: Existing Culvert Diameter: 0.3m Culvert Construction Type: Concrete circular culvert Watercourse Width: 0.5m Watercourse Depth: 0.2m Notes: None.</p>
<p>Photograph Looking at Culvert Entrance from Upstream</p>	
<p>Photograph Looking at Culvert Exit from Downstream</p>	



Watercourse Crossing ID	WX14
Watercourse Crossing Details	<p>Grid Reference: E 172518 / N 644835</p> <p>Status: Existing</p> <p>Culvert Diameter: 0.5m</p> <p>Culvert Construction Type: Plastic circular culvert reinforced with stone.</p> <p>Watercourse Width: 1m</p> <p>Watercourse Depth: 0.3m</p> <p>Notes: None.</p>
Photograph Looking at Culvert Entrance from Upstream	
Photograph Looking at Culvert Exit from Downstream	



2.2 New Watercourse Crossings

The locations of proposed new crossings are shown on Figure 9.1. Two new crossings (WX15 – WX16) are required as part of the Proposed Development, details of which are included below.

Watercourse Crossing ID	WX15
Watercourse Crossing Details	<p>Grid Reference: E 172449 / N 644732</p> <p>Status: New</p> <p>Watercourse Width: 0.7m</p> <p>Watercourse Depth: 0.3m</p> <p>Notes: Small watercourse incised in superficial gravels with reeds and long grasses.</p>
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Culvert Registration



Watercourse Crossing ID	WX16
Watercourse Crossing Details	<p>Grid Reference: E 172140 / N 644091</p> <p>Status: New</p> <p>Watercourse Width: 1m</p> <p>Watercourse Depth: 0.2m</p> <p>Notes: Located within a wider channel approximately 1.5m deep. Boulders noted within the channel bed.</p>
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Culvert Registration



