

Technical Appendix 9.1: Watercourse Crossings and Buffer Assessment

Glenouthier Wind Farm EIA Report

Technical Appendix 9.1: Watercourse Crossings and Buffer Assessment

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1 Introduction

This technical appendix presents information on proposed engineering activities in the water environment or close to the water environment for the Proposed Development. This information is required to assess the effects on the water environment and inform statutory consultees (e.g. SEPA) and the Applicant on the likely requirements for Environmental Authorisations (Scotland) Regulations (EASR) registrations and permits.

The Proposed Development is located on Glenouther Moor, to the immediate south of Corsehouse reservoir, and approximately 4.5 km north-east of Stewarton (hereafter referred to as 'the Site'). The Site itself is wholly within East Ayrshire.

This appendix should be read in conjunction with **Chapter 9: Hydrology, Hydrogeology, Geology and Peat** and **Chapter 4: Proposed Development Description** in Volume 2 of the EIA Report.

This appendix is supported by the following figures and annexes:

- **Figure 9.1: Hydrological Features** (see Volume 3a of the EIA Report).
- **Figure 9.2: Watercourse Buffers, Crossings and Flood Risk** (see Volume 3a of the EIA Report).
- **Annex 9.1.1: Details of Watercourse Crossings.**
- **Annex 9.1.2: Details of Buffer Encroachments.**

2 Watercourse Crossings

There are no existing tracks within the Site boundary that can be utilised to access the Proposed Development. The design and location of proposed tracks was carried out in cognisance of desk-based studies of mapped watercourses and mapped flood risk areas, along with information on small watercourses, flow paths and artificial drains which were mapped during hydrology surveys. The aim was to avoid and minimise watercourse crossings of mapped watercourses, minor watercourses¹ and artificial drains, where practicable. However, 12 new permanent watercourse crossings are required to access the Proposed Development, although 10 of these are over minor watercourses or artificial drains which were identified and mapped during the site hydrology surveys.

Engineering activities on minor watercourses (except culverting for land-gain, dredging and permanent diversions or realignments) do not normally require authorisation from SEPA under the EASR Regulations. A minor watercourse is one that is not shown on the 1:50,000 scale Ordnance Survey maps (Landranger series). Of the 12 new crossings required for the Proposed Development, 10 are over small, minor watercourses and will not require registration or a permit under EASR; however, the work will follow general good construction practice and SEPA GBR 6 and 9. The rules for GBR6 and 9 are set out below.

GBR 6² applies to the installation of a crossing where no part of the crossing is on the bed or banks of a river, burn, ditch or loch and must follow the rules below:

- a) Vegetation on any bank of the river, burn, ditch or loch may be removed or modified only to the extent that the works cannot be reasonably be carried out without such removal or modification,
- b) any vegetation removed must not be disposed of into the river, burn, ditch or loch,
- c) the works must not prevent the free passage of migratory fish,
- d) the works must not result in the narrowing of the channel width nor the heightening of either bank,
- e) any works in the wetted part of any river, burn, ditch or loch must not be undertaken during periods in which fish are likely to be spawning in the river, burn, ditch or loch nor in the period between any such spawning and the subsequent emergence of the juvenile fish,
- f) all reasonable steps must be taken to ensure that the works do not result in increased erosion of the bed or banks of the river, burn, ditch or loch,
- g) the works must not result in the introduction of any substance or heat to the water environment which may give rise to harm to the water environment,
- h) any outfall and associated works must be designed and installed to be no larger than is necessary for the proper operation of the outfall, and in any case must not extend more than 20 metres along the length of the river, burn, ditch or loch.

GBR9³ applies to operating vehicles, plant or machinery in or near any surface water or wetland:

- a. Any vehicles, plant or other equipment must only operate in water where it is impracticable for them to operate on dry land,
- b. the refuelling of vehicles, plant or other equipment must be undertaken at least 10 metres from any—

¹ A minor watercourse is defined by SEPA as one that is not shown on 1:50,000 scale Ordnance Survey maps. SEPA do not normally require an authorisation for engineering activities on minor watercourses with the exception of culverting for land-gain, dredging and permanent diversions/realignments

² <https://beta.sepa.scot/regulation/authorisations-and-compliance/easr-authorisations/water-activities/engineering/crossings/crossing-with-no-part-of-the-crossing-on-the-bed-or-banks/>

³ <https://beta.sepa.scot/regulation/authorisations-and-compliance/easr-authorisations/water-activities/engineering/operating-vehicles-plant-or-machinery-in-or-near-any-surface-water-or-wetland/>

- i. river, burn, canal, ditch or loch, as measured from the top of the bank,
 - ii. wetland,
 - iii. transitional water or coastal water, as measured from the shoreline,
- c. any static plant or equipment used within 10 metres of any—
 - i. river, burn, canal, ditch or loch, as measured from the top of the bank,
 - ii. wetland,
 - iii. transitional water or coastal water, as measured from the shoreline,
 must be positioned on a suitably sized and maintained impervious drip tray with a capacity equal to 110% of the capacity of the fuel tank which is supplying the plant or equipment,
- d. any vehicle, plant or other equipment used in or near surface water or wetland must not leak any oil,
- e. the washing of vehicles, plant or other equipment must be undertaken at least 10 metres away from any—
 - i. river, burn, ditch or loch, as measured from the top of the bank,
 - ii. wetland, or
 - iii. transitional water or coastal water, as measured from the shoreline,
- f. vehicles, plant or other equipment must not be operated in the wetted part of a river, burn, ditch or loch during periods in which fish are likely to be spawning in the river, burn, ditch or loch nor during the period between any such spawning and the subsequent emergence of the juvenile fish,
- g. vehicles, plant or equipment must not be operated in any part of a river, burn, ditch or loch if there is a reasonable likelihood that, within 50 metres of such an operation, there are freshwater pearl mussels,
- h. during forestry operations the operator must not operate machinery in any surface water or wetland,
- i. following the operation of the vehicle, plant or other machinery, any damage caused by the operation to the bed and banks of the surface water or wetland must be repaired, including re-establishing vegetation on any areas of bare earth on the banks resulting from the operation, either by covering the area with grass turfs or lining them with a biodegradable geotextile and seeding.

The remaining two watercourse crossings (Crossing ID1 and ID6) will either require registration or a permit under EASR, will require specific mitigation measures and will be regulated via the EASR authorisation process.

Appropriate bridging solutions or bottomless arched culverts will be designed to avoid affecting the bed and banks of watercourses. Fording of watercourses will be avoided. Design and implementation of crossings will follow best practice, including recommendations in Engineering in the Water Environment Good Practice Guide - River Crossings (SEPA, 2010), Good Practice during Windfarm Construction (Scottish Renewables et al. 2024), Constructed tracks in the Scottish Uplands (SNH, 2015) and WAT-G-024 EASR Guidance: Engineering: Activity Guide: Crossings (SEPA, 2025). All new crossings will be designed to pass the 0.5% annual exceedance probability flows, with an appropriate allowance for climate change, as recommended by SEPA.

Embedded and Good Practice Mitigation measures (e.g. construction Sustainable Drainage Systems (SuDS) and pollution control measures) specific to watercourse crossings, and around all construction working areas and infrastructure to avoid and minimise the risk to the water environment, are described in **Chapter 9, Section 9.7**. During construction, temporary construction SuDS will be put in place at each watercourse crossing as a means of good practice to ensure no sedimentation from construction

works or pollution from plant or machinery can enter the watercourse. This could be a series of swales, settlement ponds or settlement tanks and silt fences.

Annex 9.1.1: Details of Watercourse Crossings presents details and descriptions of the 12 new permanent crossings that will be required for the Proposed Development. Their locations are shown in **Figure 9.2: Watercourse Buffers, Crossings and Flood Risk**.

3 Watercourse Buffer Encroachments

In their scoping guidance (**Table 9.1** of **Chapter 9** of the EIA Report), The Scottish Environment Protection Agency (SEPA) recommend a buffer of 50 m around each loch / watercourse for excavations greater than 1 m. For temporary infrastructure, or infrastructure requiring less than 1 m excavation, the SEPA Recommended Riparian Corridor (SEPA, 2024) buffer width is recommended. The recommended riparian buffer is scaled to channel width as:

Channel width	Recommended buffer (each side of channel)
<2 m	10 m
2-15 m	15 m
>15 m	30 m

This was achieved for most of the watercourses on the Site, with the exception of track watercourse crossings.

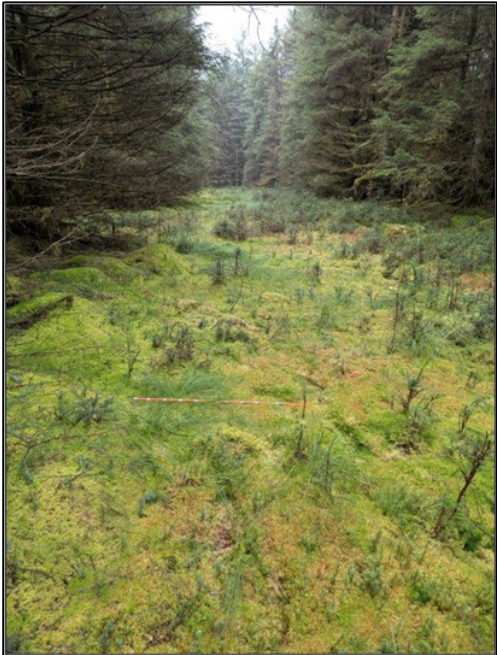
Buffer encroachments are detailed in **Annex 9.1.2: Details of Buffer Encroachments**, along with photographs and details of potential effects and any additional mitigation required. These locations are shown on **Figure 9.2** of Volume 3a of EIA Report, which also shows the 50m buffer and the Recommended Riparian Corridor buffer. All the locations where buffers were not achieved are on small, unnamed watercourses or artificial drains not shown on Ordnance Survey mapping, which were observed during hydrology surveys of the Site.

Based on the design of the Proposed Development, there are five locations where a 50 m buffer from excavations greater than 1m could not be achieved; in four of these locations, the SEPA Recommended Riparian Corridor buffer (SEPA, 2024) could not be achieved either. In two locations, diversion of artificial forestry drains around the proposed permanent infrastructure will be undertaken as part of the design. It is noted that there is a 50m micro-siting allowance which would provide opportunities to reducing the number of areas where relevant buffers could be achieved during detailed design.

Annex 9.1.1: Watercourse Crossings

ID - 1 (see Figure 9.2d) New track crossing	Unnamed tributary to the Swinzie Burn
Description: Unnamed, artificial watercourse running adjacent to existing track. Drains to Swinzie Burn, flowing south.	
NGR Ref: 249168, 649087	
Photo - watercourse looking upstream 	Photo - watercourse looking downstream 
Width of watercourse (m)	2.10
Bed sediment	Peat
Bank erosion	No
Natural channel	No
Proposed Infrastructure	Permanent access track
Crossing type	Proposed – Bottomless arch culvert or single span bridge
Additional mitigation	None
Catchment (km²)	0.1
Minor watercourse⁴	No
Main river catchment	Swinzie Burn
EASR authorisation required	Yes (likely Registration)

⁴ A minor watercourse is defined by SEPA as one that is not shown on 1:50,000 scale Ordnance Survey maps. SEPA do not normally require an authorisation for engineering activities on minor watercourses with the exception of culverting for land-gain, dredging and permanent diversions/realignments.

ID – 2 (Figure 9.2e) New track crossing	Unnamed tributary to the Swinzie Burn
Description: Unnamed watercourse within forestry break. Tributary to Swinzie Burn, flowing south. Diffuse flow at this location – more defined channel upstream and downstream.	
NGR Ref: 248960, 648855	
Photo - watercourse looking upstream 	Photo - watercourse looking downstream 
Width of watercourse (m)	3.20 (diffuse flow at this location, not a defined channel)
Bed sediment	Peat
Bank erosion	No
Natural channel	Yes
Proposed Infrastructure	Permanent access track (floating)
Crossing type	Proposed – Bottomless arch culvert, single span bridge or suitable drainage (e.g. numerous pipes) within the track.
Additional mitigation	None
Catchment (km ²)	0.05
Minor watercourse	Yes
Main river catchment	Swinzie Burn
EASR authorisation required	No

ID – 3 (Figure 9.2e)
New track crossing

Artificial forestry drain

Description: Artificial forestry drain. Drains south to Swinzie Burn

NGR Ref: 248724, 648582

Photo - watercourse looking upstream



Photo - watercourse looking downstream



Width of watercourse (m)	0.30
Bed sediment	Peat
Bank erosion	No
Natural channel	No
Proposed Infrastructure	Permanent access track
Crossing type	Proposed – Bottomless arch culvert or single span bridge
Additional mitigation	None
Catchment (km ²)	< 0.05
Minor watercourse	Yes
Main river catchment	Swinzie Burn
EASR authorisation required	No

ID – 4 (Figure 9.2e) New track crossing	Artificial forestry drain
<u>Description:</u> Artificial forestry drain. Drains southwest to Swinzie Burn	
NGR Ref: 248643, 648486	
Photo - watercourse looking upstream 	Photo - watercourse looking downstream 
Width of watercourse (m)	0.20
Bed sediment	Peat
Bank erosion	No
Natural channel	No - showing signs of naturalisation but artificial in origin
Proposed Infrastructure	Permanent access track
Crossing type	Proposed – Bottomless arch culvert or single span bridge
Additional mitigation	None
Catchment (km ²)	< 0.05
Minor watercourse	Yes
Main river catchment	Swinzie Burn
EASR authorisation required	No

ID – 5 (Figure 9.2e) New track crossing	Artificial forestry drain
<u>Description:</u> Artificial forestry drain. Drains southwest to Swinzie Burn	
NGR Ref: 248313, 648378	
Photo - watercourse looking upstream 	Photo - watercourse looking downstream 
Width of watercourse (m)	0.40
Bed sediment	Peat
Bank erosion	Yes
Natural channel	No - showing signs of naturalisation but artificial in origin
Proposed Infrastructure	Turbine hardstanding and access track (permanent)
Crossing type	Proposed – Bottomless arch culvert or single span bridge for track crossing. The drain may be diverted around the turbine hardstanding/ working area or micro-siting will be undertaken in advance of construction, which will avoid the need for a long culvert. A permanent track crossing will still be required.
Additional mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km ²)	< 0.05
Minor watercourse	Yes
Main river catchment	Swinzie Burn

EASR authorisation required

No

ID – 6 (Figure 9.2a)
New track crossing

Unnamed tributary to the Swinzie Burn

Description: Meandering tributary to the Swinzie Burn flowing south. SEPA future flood maps indicate a 50 m wide flood risk area associated with this tributary, which will be taken into consideration during detailed design of the crossing

NGR Ref: 248151, 648404

Photo - watercourse looking upstream



Photo - watercourse looking downstream



Width of watercourse (m)

0.40

Bed sediment

Gravel

Bank erosion

Yes

Natural channel

Yes

Proposed Infrastructure

Permanent access track (floating)

Crossing type

Proposed – due to the large flood risk area associated with this watercourse, a single span bridge and suitable drainage (e.g. numerous pipes) within the track will be put in place. The track is proposed to be floated in this location which will allow hydrological connectivity beneath the track.

Additional mitigation

None

Catchment (km²)

0.64

Minor watercourse

No

Main river catchment

Swinzie Burn

EASR authorisation required

Yes (Registration or Permit)

ID – 7 (Figure 9.2a)
New track crossing

Unnamed tributary to the Swinzie Burn

Description: Tributary to the Swinzie Burn flowing south.

NGR Ref: 248039, 648416

Photo - watercourse looking upstream



Photo - watercourse looking downstream



Width of watercourse (m)	0.60
Bed sediment	Peat
Bank erosion	No
Natural channel	Yes
Proposed Infrastructure	Permanent access track (floating)
Crossing type	Proposed – Bottomless arch culvert or single span bridge
Additional mitigation	None
Catchment (km ²)	0.12
Minor watercourse	Yes
Main river catchment	Swinzie Burn
EASR authorisation required	No

ID – 8 (Figure 9.2a) New track crossing	Unnamed watercourse
<u>Description:</u> Unnamed natural watercourse fed by local artificial drainage.	
NGR Ref: 248137, 648734	
Photo - watercourse looking upstream 	Photo - watercourse looking downstream 
Width of watercourse (m)	0.30
Bed sediment	Peat
Bank erosion	No
Natural channel	Yes
Proposed Infrastructure	Permanent access track (floating)
Crossing type	Proposed – Bottomless arch culvert or single span bridge
Additional mitigation	None
Catchment (km ²)	< 0.05
Minor watercourse	Yes
Main river catchment	Swinzie Burn
EASR authorisation required	No

ID – 9 (Figure 9.2c) New track crossing	Unnamed watercourse
<u>Description:</u> Unnamed natural watercourse fed by local artificial drainage, flowing south.	
NGR Ref: 248295, 648826	
Photo - watercourse looking upstream 	Photo - watercourse looking downstream 
Width of watercourse (m)	0.30
Bed sediment	Gravel
Bank erosion	Yes
Natural channel	Yes
Proposed Infrastructure	Permanent access track
Crossing type	Proposed – Bottomless arch culvert or single span bridge
Additional mitigation	None
Catchment (km ²)	0.17
Minor watercourse	Yes
Main river catchment	Swinzie Burn
EASR authorisation required	No

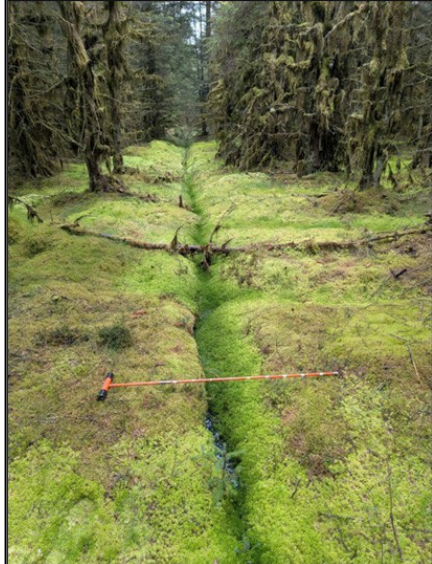
ID – 10 (Figure 9.2c) New track crossing	Artificial forestry drain
<u>Description:</u> Unnamed natural watercourse fed by local artificial drainage, flowing southwest.	
NGR Ref: 248344, 648985	
Photo - watercourse looking upstream 	Photo - watercourse looking downstream 
Width of watercourse (m)	0.20
Bed sediment	Peat
Bank erosion	No
Natural channel	No
Proposed Infrastructure	Permanent access track (floating)
Crossing type	Proposed – Bottomless arch culvert or single span bridge
Additional mitigation	None
Catchment (km ²)	< 0.05
Minor watercourse	Yes
Main river catchment	Swinzie Burn
EASR authorisation required	No

ID – 11 (Figure 9.2a) New track crossing	Artificial forestry drain
<u>Description:</u> Unnamed natural watercourse fed by local artificial drainage, flowing west.	
NGR Ref: 247657, 648722	
Photo - watercourse looking upstream 	Photo - watercourse looking downstream 
Width of watercourse (m)	0.60
Bed sediment	Peat
Bank erosion	Yes
Natural channel	No
Proposed Infrastructure	Permanent access track (floating)
Crossing type	Proposed – Bottomless arch culvert or single span bridge
Additional mitigation	None
Catchment (km ²)	< 0.05
Minor watercourse	Yes
Main river catchment	Swinzie Burn
EASR authorisation required	No

ID – 12 (Figure 9.2a) New track crossing	Headwater to OS-marked watercourse
<u>Description:</u> Unnamed natural watercourse. This headwater is highly diffuse and encompasses a large, saturated, boggy area. The headwater is fed by a groundwater spring that rises northeast of the OS-marked watercourse.	
NGR Ref: 247624, 648808	
Photo – boggy headwater area looking upstream 	Photo – boggy headwater area looking downstream 
Width of watercourse (m)	Diffuse flow over ~3.5 m wide, wet area
Bed sediment	Gravel
Bank erosion	No
Natural channel	Yes
Proposed Infrastructure	Permanent access track (floating) and temporary hardstanding (floating).
Crossing type	Proposed – Bottomless arch culvert or single span bridge. The floated track will be designed with sufficient drainage pipes/culverts to allow the flow to pass underneath the track, maintaining hydrological connectivity.
Additional mitigation	None
Catchment (km ²)	0.06
Minor watercourse	Yes
Main river catchment	Swinzie Burn
EASR authorisation required	No

Annex 9.1.2: Buffer Encroachments

ID – A (Figure 9.2e)		Artificial forestry drain	
Description: Minor artificial forestry drainage which flows south towards the Swinzie Burn. During hydrological survey, this watercourse was noted to have some baseflow. The heavily vegetated channel indicates that there is typically minimal flow in this portion of the watercourse.			
NGR Ref: 248724, 648582			
Photo - watercourse looking upstream		Photo - watercourse looking downstream	
			
Width of watercourse (m)		0.3	
Infrastructure and Ancillary Works Description		Substation compound – excavation over 1m	
Temporary or Permanent		Permanent	
Buffer type encroached		50 m SEPA Recommended Buffer encroached Recommended Riparian Corridor buffer is achieved.	
Width of Buffer Strip Achieved (m)		25	
Water feature upgradient or downgradient of proposed infrastructure		Minimal elevation difference	
Main river catchment		Swinzie Burn	
Potential Effect/Comment		Flow path analysis indicates that surface water runoff paths are from the infrastructure towards the drain. Embedded and Good Practice Mitigation (i.e. construction and permanent SuDS) will be included in the design. Surface water runoff will be treated and attenuated. The Proposed Development is not located within the flow path of the drain. Any flood flows in the drain would flow south towards the Swinzie Burn and away from the Proposed Development. The buffer width achieved (25 m) is considered adequate for size and nature of this water feature. The magnitude of effect is assessed to be negligible resulting in an effect of negligible significance.	
Additional Mitigation		None	

ID – B (Figure 9.2e) Artificial forestry drain	
Description: Minor artificial forestry drainage which flows southwest towards the Swinzie Burn. During hydrological survey, this drain was noted to contain moderate flows. The heavily vegetated channel indicates that there is typically low flow in this portion of the watercourse.	
NGR Ref: 248643, 648486	
Photo - watercourse looking upstream 	Photo - watercourse looking downstream 
Width of watercourse (m)	0.3
Infrastructure and Ancillary Works Description	Substation compound
Temporary or permanent	Permanent
Buffer type encroached	10 m SEPA Recommended Riparian Buffer; 50 m SEPA Recommended Buffer
Width of buffer strip achieved (m)	n/a. The drain will be re-routed as part of design.
Main river catchment	Swinzie Burn
Potential Effect/Comment	As set out in Scottish Renewables et al. 2024, “Good Practice during Windfarm Construction”⁵ in relation to drain management: <i>“Where the surface drainage across the compound could affect its integrity a perimeter drain should be designed taking into account mitigation for sediment transport”.</i> This drain is to be re-routed around the proposed substation compound as part of the design. Embedded and Good Practice Mitigation (i.e. construction and permanent SuDS) will be included in the design. Surface water runoff will be treated and attenuated. The magnitude of effect is assessed to be negligible resulting in an effect of negligible significance.
Additional Mitigation	None

⁵Scottish Renewables et al. 2024, “Good Practice during Windfarm Construction”. Available online at: <https://www.nature.scot/doc/good-practice-during-wind-farm-construction>

ID – C (Figure 9.2e)		Artificial forestry drain	
Description: Minor artificial forestry drainage which flows southwest towards the Swinzie Burn. During hydrological survey, this watercourse was noted to contain moderate flows. The eroded banks and naturalising channel geomorphology indicate moderate flows are typical.			
NGR Ref: 248313, 648378			
Photo - watercourse looking upstream		Photo - watercourse looking downstream	
			
Width of watercourse (m)		0.3	
Infrastructure and Ancillary Works Description		Turbine 5, permanent and temporary hardstanding	
Temporary or permanent		Permanent	
Buffer type encroached		10 m SEPA Recommended Riparian Buffer; 50 m SEPA Recommended Buffer	
Width of buffer strip achieved (m)		n/a. The drain will be re-routed as part of design.	
Main river catchment		Swinzie Burn	
Potential Effect/Comment		As set out in Scottish Renewables et al. 2024, “Good Practice during Windfarm Construction”⁶ in relation to drain management: <i>“Where the surface drainage across the compound could affect its integrity a perimeter drain should be designed taking into account mitigation for sediment transport”.</i> This drain is to be re-routed around the hardstanding as part of the design. Embedded and Good Practice Mitigation (i.e. construction and permanent SuDS) will be included in the design. Surface water runoff will be treated and attenuated. The magnitude of effect is assessed to be negligible resulting in an effect of negligible significance.	
Additional Mitigation		None	

⁶Scottish Renewables et al. 2024, “Good Practice during Windfarm Construction. Available online at: <https://www.nature.scot/doc/good-practice-during-wind-farm-construction>

ID – D (Figure 9.2c)		Artificial forestry drain	
<u>Description:</u> Minor artificial forestry drainage which flows southwest along forestry partition. During hydrological survey, this watercourse was noted to have moderate baseflow. The heavily vegetated channel indicates that there is typically low flow in this portion of the drain/watercourse.			
NGR Ref: 248331, 648900			
Photo – watercourse/drain looking upstream		Photo – watercourse/drain looking downstream	
			
Width of watercourse (m)		0.6	
Infrastructure and Ancillary Works Description		Floating access track to Turbine 3	
Temporary or Permanent		Permanent	
Buffer type encroached		10 m SEPA Recommended Riparian Corridor	
Width of Buffer Strip Achieved (m)		6	
Water feature upgradient or downgradient of proposed infrastructure		Minimal elevation difference	
Main river catchment		Swinzie Burn	
Potential Effect/Comment		Flow path analysis indicates that there is no hydrological connectivity between the track and the drain. The track in this area is to be floated and so will not affect pre-existing flow paths in the area. Embedded and Good Practice Mitigation (i.e. construction and permanent SuDS) will be included in the design. Surface water runoff will be treated and attenuated. The track is not located within the flow path of the drain. Flood flows would flow southwest towards a minor watercourse crossing (crossing ID9) as part of the Proposed Development and be conveyed underneath the track. The buffer width achieved (6 m) is considered adequate for size and nature of this water feature. The magnitude of effect is assessed to be negligible resulting in an effect of negligible significance.	
Additional Mitigation		None	

ID – E (Figure 9.2a)	Artificial forestry drain
Description: Artificial drainage channel that flows west towards a tributary of the Swinzie Burn. During hydrological survey, this watercourse was noted to contain moderate flows. The eroded banks and deep, incised channel geomorphology indicate moderate flows are typical.	
NGR Ref: 247657, 648722	
Photo - watercourse looking upstream 	Photo - watercourse looking downstream 
Width of watercourse (m)	0.6
Infrastructure and Ancillary Works Description	Temporary auxiliary crane pad (piled) for Turbine 1
Temporary or permanent	Temporary
Buffer type encroached	50 m SEPA Recommended Buffer 10 m SEPA Recommended Riparian Corridor
Width of buffer strip achieved (m)	0 m
Main river catchment	Swinzie Burn
Potential Effect/Comment	Embedded and Good Practice Mitigation (i.e. construction and permanent SuDS) will be included in the design of the piled foundations and temporary crane pads. Surface water runoff will be treated and attenuated. The Applicant has committed to achieving a 10 m buffer from the watercourse during micro-siting in detailed design. If this cannot be achieved, the drain will be diverted during construction. The temporary crane pad will be piled and restored post-construction. There is a risk of sediment run-off/ pollution temporarily entering the drain during construction if an appropriate buffer cannot be achieved for the temporary works. The effect on water quality is considered to be temporary and of minor magnitude. The sensitivity is medium resulting in a minor effect on downstream water quality before additional mitigation. The effect on channel morphology is considered to be temporary and of negligible magnitude. The sensitivity (morphology) is low, resulting in an effect of negligible significance.

Additional Mitigation	The temporary crane pad will be micrositied to maintain a 10 m buffer distance from the drain. If this cannot be achieved, the drain will be diverted during construction. Additional Mitigation (e.g. silt fences/additional SuDS) will be installed between the crane pad and the drain to reduce the risk of sediment/silt runoff during construction
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ID – F (Figure 9.2a)		Diffuse flow in the headwaters of an unnamed and unmapped watercourse	
Description: Heavily saturated, diffuse, boggy area which flows southwest towards a tributary of the Swinzie Burn. During hydrological survey, it was considered likely that this headwater is fed by a groundwater spring that rises northeast of this area.			
NGR Ref: 247624, 648808			
Photo – boggy headwater area looking upstream 		Photo – boggy headwater area looking downstream 	
Width of watercourse (m)		3.5 m – diffuse flow.	
Infrastructure and Ancillary Works Description		Permanent hardstanding (piled), temporary hardstanding (floating) and auxiliary crane pad (piled) for Turbine 1.	
Temporary or permanent		Permanent and temporary. Permanent hardstanding for T1 and the temporary crane pads will be raised on piled foundations to reduce impacts on peat. Temporary hardstanding will be floated. This will reduce impacts on peat and will allow subsurface flow paths to be maintained.	
Buffer type encroached		50 m SEPA Recommended Buffer 10 m SEPA Recommended Riparian Corridor	
Width of buffer strip achieved (m)		26 m (from permanent piled hardstanding for T1) 0 m from temporary floating hardstanding 35 m from temporary crane pad (piled)	
Main river catchment		Swinzie Burn	
Potential Effect/Comment		Embedded and Good Practice Mitigation (i.e. construction and permanent SuDS) will be included in the design of the piled foundations. Surface water runoff will be treated and attenuated.	

	There will also be a permanent track crossing here (Crossing ID 12), which will allow flows in the headwater to pass downstream without impacting infrastructure or affecting downstream flood risk. The Applicant has committed to micro-siting the temporary hardstanding through detailed design to avoid the watercourse and achieve a 10 m buffer from the watercourse, if possible. Alternatively, the headwater channel will be temporary culverted under the temporary hardstanding if an appropriate buffer cannot be achieved. There is a risk of sediment run-off/ pollution temporarily entering the headwater during construction works for the hardstanding if an appropriate buffer cannot be achieved. The effect on water quality is considered to be temporary and of moderate magnitude. The sensitivity is medium resulting in a moderate effect on water quality before additional mitigation. The effect on channel morphology is considered to be temporary and of minor magnitude. The sensitivity (morphology) is low, resulting in an effect of minor significance.
Additional Mitigation	The temporary hardstanding will be micro-sited to maintain a 10 m buffer distance from the headwater channel, if possible. If this cannot be achieved, the channel will be temporarily culverted under the hardstanding during construction. If temporary culverting is required, the channel morphology will be restored post culverting. It is noted that a permanent new crossing of this channel (ID12) will be required for the floated access track. Additional Mitigation (e.g. silt fences/additional SuDS) will be installed between the hardstanding areas and the watercourse to reduce the risk of sediment/silt runoff during construction.