Appendix 8.5 Watercourse Crossing Inventory

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1 Introduction

The infrastructure of the Proposed Development will be comprised of approximately 13.1 km of existing tracks that will be upgraded and widened and 3.7 km of new floated tracks. The track layout has been designed to avoid watercourses and use existing access tracks where possible, with a preference for crossing of smaller scale watercourses.

This appendix provides an inventory of information on each watercourse crossing including scale, dimensions, bedload, vegetation, along with the proposed type of crossing to be installed. At design phase these crossings will be sized by the appointed Principal Contractor to allow the 200-year annual probability event plus climate change flows and freeboard.

This appendix should be read in conjunction with EIA Report **Chapter 8: Hydrology, Geology, Hydrogeology and Peat.**

2 Hydrological Context

The Site predominantly drains to the north-east through four main watercourses and their associated tributaries, which ultimately discharge into Loch Moy either directly or via its tributary, Allt Creag Bheithin. From Loch Moy, water flows into the Funtack Burn, which joins the River Findhorn approximately 3.7 km east of the Site near Milton of Moy. A smaller portion of the Site, located in the western area, drains north-west into Allt na Fuar-ghlaic, which eventually flows into the River Nairn, situated around 4.7 km north-west of the Site.

The Site is therefore located within two primary catchments: the River Findhorn catchment to the east and the River Nairn catchment to the north-west.

Topographic analysis using 1:50,000 scale Ordnance Survey (OS) mapping indicates the presence of 16 watercourses/tributaries within the Site boundary. Of these, all but three flow approximately north-east towards Loch Moy. The remaining three watercourses drain north-west towards the River Nairn. Additionally, the mapping identifies a single surface waterbody, Loch Moy, located approximately 0.7 km outside the north-eastern Site boundary.

A more detailed review of 1:25,000 scale OS mapping has revealed five additional un-named tributaries within the Site boundary, which are tributaries of the larger watercourses identified at the 1:50,000 scale. These smaller tributaries highlight the complexity of drainage patterns within the Site and the importance of considering all contributing watercourses in the assessment.

No watercourses on Site are classified by the Scottish Environment Protection Agency (SEPA) in their Water Environment Hub[Error! Bookmark not defined.]. This is likely due to the smaller scale of the watercourses, which are not typically monitored under SEPA's classification system. Nevertheless, these watercourses remain significant in the context of local hydrology and must be carefully considered during the planning and design of watercourse crossings to avoid impacts on natural drainage patterns and downstream receptors such as Loch Moy and the River Findhorn.

This hydrological background underpins the assessment of watercourse crossings, informing the identification of key watercourses and guiding the design of infrastructure to minimise environmental impacts and ensure sustainable management of water resources.

3 Legislative Context

The water environment includes wetlands, rivers, lochs, transitional waters (estuaries), coastal waters and groundwater. SEPA guidance [1]in relation to The Water Environment (Controlled Activities) (Scotland) Regulations 2011[2] (as amended) (known as CAR) states that it is an offence to undertake the following activities without a CAR authorisation:

- Discharges to all wetlands, surface waters and groundwater;
- Disposal to land;
- Abstractions from all wetlands, surface waters and groundwaters;
- Impoundments (dams and weirs) of rivers, lochs, wetlands and transitional waters; and
- Engineering works in inland waters and wetlands.

Watercourse crossing requirements (engineering works in inland waters and wetlands) is detailed under Section 6 of the CAR Practical Guide[2]. Three different types of authorisations under CAR allow for proportionate and risk-based regulation. The authorisation process operates at three levels which are:

- General Binding Rules (GBR);
- Registrations; and
- Licences.

These levels cover activities with increasing potential impact upon the environment. Minor watercourses, which do not feature on the 1:50,000 scale Ordnance Survey (OS) mapping, are not within the remit of CAR regulations for track crossings. However, these minor watercourse crossings have been considered within this report.

It would be the objective of the Applicant to ensure that all activities remain within the General Binding Rules (Engineering Activities[2]) identified in guidance. The applicable Engineering Activities that this application shall adhere to are as follows:

- GBR 6 – Minor bridges with no construction on bed or banks;
- GBR 8 – Controlling bank erosion by green bank reinforcement or re-profiling;
- GBR 9 – Operating any vehicle, plant or equipment (machinery) when undertaking other GBR activities (which includes GBR 6 and 8).
- Registration – Bridges with no construction on bed and <20m of total bank affected (open-based culverts would be anticipated to fall within this category);
- Registration – Where cables are not appropriately located to cross water channels via newly installed track infrastructure, it would be anticipated a Registration would be

[1] SEPA (2022), The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended), A Practical Guide, version 9.2

[2] Available online: https://www.legislation.gov.uk/ssi/2011/209/contents/made [Accessed May 2023]

required, as cables would be anticipated being installed via isolated open-cut technique, due to small channel size; and

- Simple Licence – for all other bridges, fords and causeways, such as those with construction on bed and greater than 20m of total bank affected. Larger culverts may fall within this category.

Should activities be determined to be outwith the above GBR and Registration authorisations, it would be appropriate to consider a licence application (simple or complex). SEPA[3] lists conservation, environmental standards for morphology and good practice as tests for any licence application. During the determination, SEPA shall consider the specific location, type, size and existing water quality of the local water features.

A Construction run-off permit will be required, in accordance with CAR. This application process shall be undertaken pre-construction, providing supplementary information to that available at the EIA Report stage.

A large and complex construction project licence authorisation from SEPA will be required as it is a development project that undertakes one or more “controlled activity” including the discharge of water run-off from a construction site to the water environment), has greater than 5km new track and is "an onshore electricity generating station, wind farm or power station with a capacity of greater than 50megawatts”.

The SEPA large and complex construction project licence must be applied for and be granted before the activity can take place.

4 Desk Study

The desk study consisted of a review of the information regarding the Proposed Development, principally involving an examination of the proposed track layout and the identification of watercourses marked on the OS 1:50,000 scale map which would require crossings, under the CAR Regulations. Crossings of minor watercourses were also identified at OS 1:25,000 and 1:10,000 OS scale mapping. This information informed the design to minimise crossing locations of all mapped watercourses.

5 Walkover Surveys

Subsequent to the initial desk study, walkover surveys of the Site were conducted 14th and 15th January 2025 for the infrastructure layout, during which the crossing locations were visited to obtain specific information about each location that would inform decisions on the proposed crossing structures. Photographs and detailed field notes were taken reporting channel and valley dimensions, channel substrate and type of either the existing or proposed crossing. A hand-held GPS unit with greater than 5m accuracy was used to obtain locations.

[3] Available online: https://www.sepa.org.uk/regulations/water/engineering/engineering-guidance/ [accessed May 2023]

6 Ecological Provision

The Site is situated in an upland peatland environment with small, shallow watercourses that are unlikely to support fish migration or provide suitable habitat for otters. These watercourses typically exhibit low flow conditions, further reducing the likelihood of fish or mammal presence. However, otters are known to be present within the Site (see Ecology Figures 6.4 and 6.9), and the site access crosses watercourses that could result in some limited fragmentation along the Allt na Loinne Moire. While this is not considered to be substantial in scale (likely only affecting part of a single otter territory), the crossing designs will take into account the potential for fragmentation. Where required, designs appropriate for otter passage will be included, such as wildlife-friendly culverts, to ensure minimal disruption and maintain connectivity. The crossing designs will also prioritise maintaining the natural hydrological and geomorphological characteristics of the watercourses to minimise disruption to downstream habitats and preserve overall ecosystem functionality.

7 Watercourse Crossings

A total of 7 watercourse crossings will be constructed on Site for the Proposed Development. These are comprised of:

- All 7 watercourse crossings identified on the 1:50,000 scale OS mapping will require new permanent crossings. However, two of these watercourses are already being utilised, with temporary tracks currently in place allowing vehicle access.

All proposed watercourse crossings are listed in **Table 1** and shown on **Figures 8.6**: **Hydrological Features**.

It is anticipated that several additional crossings will be required over eroded peat gullies that are not all marked as watercourses. These features are prevalent throughout the site and vary in width, depth, and the quantity of water present. Flow within these gullies is typically diffuse, with water spread across small ponds or channels rather than confined. The proposed crossings will address the fragmented nature of the eroded peatland terrain, ensuring access while minimising further disturbance to the surrounding environment. Some typical examples are shown in **Table 2.**

The watercourse crossing locations have been carefully designed to cross watercourses where channel sections are straighter and narrower, avoiding meanders and areas of erosion, and at angles perpendicular to the water flow where possible. The crossing locations have also considered the best approach to and from the crossings considering the topography, gradients and valley dimensions. The crossings of the larger watercourses have been carefully positioned so that single span crossing on bedrock abutments can be used.

The number of watercourse crossings has been minimised where possible.

Watercourse crossings will be subject to appropriate SEPA CAR licencing and will be designed to allow the conveyance of a 0.5% AP (Annual Probability 200 year) flow event plus an allowance for climate change and freeboard. Additionally, mitigation will be put in place to control and attenuate runoff during all phases of the development and crossings will be regularly checked and maintained during operation. Regardless of the CAR authorisation level, all watercourse crossings will be in accordance with the good practice measures provided in

Appendix 8.1 Good Practice Methods and **Technical Appendix 6.5 Outline Construction Environmental Management Plan (CEMP)**.

Table 1 Watercourse Crossing Inventory

Please refer to **Figures 8.6** for legends of figures within **Table 1** and overall location within the Site.

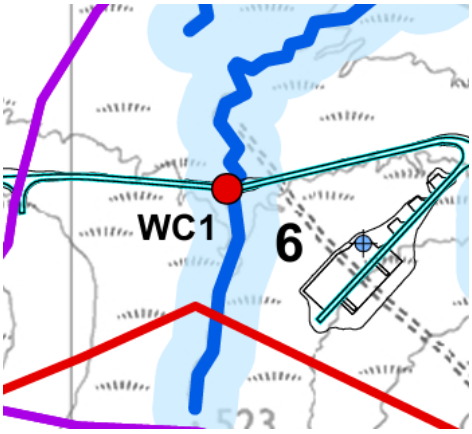
ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
WC1	273183	832736	Allt na Slanaich tributary 1:50,000 scale OS-mapped watercourse	Access track in south-west of Site.	The topography at the chosen location is appropriate for a single span bottomless arch.	**Channel dimensions:** Flow is diffuse, with water spread across puddles rather than confined to a distinct channel. The visible channel at the time of the visit was approximately 0.5 m wide and 0.2 m deep. **Valley dimensions:** The feature is a U-shaped erosional gully within the peat, with banks approximately 3 m high. The distance between the top of the banks is around 7 m. **Substrate:** Bare peat dominates, with patches of vegetation and localised areas of sands and gravels. **Channel form:** A meandering erosional peat gully. **Flow conditions:** Gentle flow observed during the visit, occurring under diffuse flow conditions. **Anticipated level of CAR authorisation:** Registration.

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				

Upstream from crossing location WC1

Watercourse crossing location WC1

Downstream from crossing location WC1



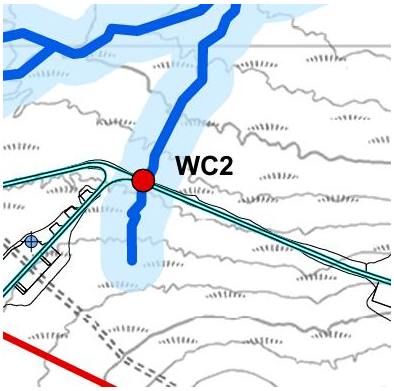
WC1 location from Figure 8.6

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
WC2	273503	832697	Allt na Slanaich tributary 1:50,000 scale OS-mapped watercourse	Access track in south-west of Site. Located ~320m east of WC1.	The topography at the chosen location is appropriate for a single span bottomless arch.	**Channel dimensions:** Flow is diffuse, with water spread across small ponds rather than flowing as a single, confined channel. At the time of the visit, visible water was approximately 0.75 m wide and 0.2 m deep. **Valley dimensions:** The feature is a U-shaped erosional gully within the peat, with banks approximately 2 m high. The distance between the top of the banks is around 7 m. **Substrate:** Dominantly bare peat, with patches of vegetation and localised areas of sands and gravels. **Channel form:** A meandering erosional peat gully. **Flow conditions:** Gentle flow observed during the visit, occurring under diffuse conditions with water distributed across ponds rather than in a defined channel. **Anticipated level of CAR authorisation:** Registration.

Upstream from crossing location WC2

Watercourse crossing location WC2

Downstream from crossing location WC2



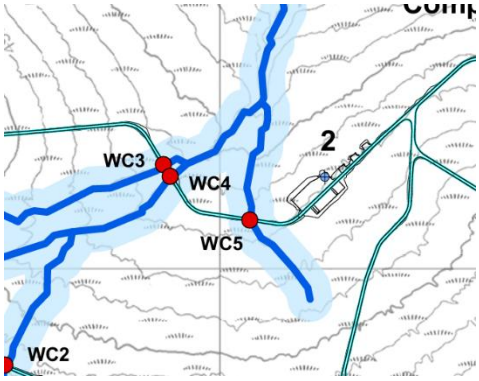
WC2 location from Figure 8.6

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
WC3	273874	833233	Allt na Slanaich tributary 1:50,000 scale OS-mapped watercourse	Access track in central-west area of Site. Located ~640m north-east of WC2.	The topography at the chosen location is appropriate for a single span bottomless arch.	**Channel dimensions:** Flow is diffuse, with water spread across small ponds rather than flowing as a single, confined channel. At the time of the visit, visible water was approximately 0.5 m wide and 0.2 m deep in the main surface water channel. **Valley dimensions:** The feature is a U-shaped erosional gully within the peat, with banks approximately 2 m high. The distance between the top of the banks is around 10 m. **Substrate:** Dominantly bare peat, with patches of vegetation and localised areas of sands and gravels. **Channel form:** A meandering erosional peat gully. **Flow conditions:** Gentle flow observed during the visit, occurring under diffuse conditions with water distributed across ponds rather than in a defined channel. **Anticipated level of CAR authorisation:** Registration.

Upstream from crossing location WC3

Watercourse crossing location WC3

Downstream from crossing location WC3



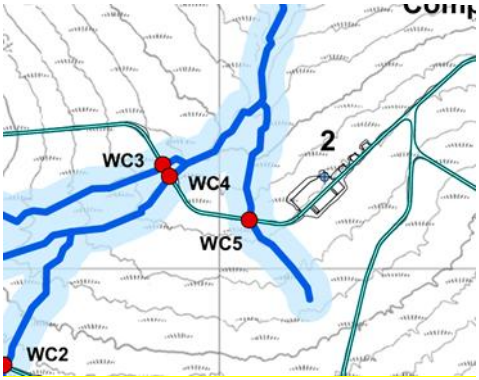
WC3, WC4 and WC5 location from Figure 8.6

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
WC4	273889	833207	Allt na Slanaich tributary 1:50,000 scale OS-mapped watercourse	Access track in central-west area of Site. Located ~35m south-east of WC3.	The topography at the chosen location is appropriate for a single span bottomless arch.	**Channel dimensions:** Flow is diffuse, with water spread across small ponds rather than flowing as a single, confined channel. At the time of the visit, visible water was approximately 0.5 m wide and 0.2 m deep in the main surface water channel. **Valley dimensions:** The feature is a U-shaped erosional gully within the peat, with banks approximately 2 m high. The distance between the top of the banks is around 5 m. **Substrate:** Dominantly bare peat, with patches of vegetation and localised areas of sands and gravels. **Channel form:** A meandering erosional peat gully. **Flow conditions:** Gentle flow observed during the visit, occurring under diffuse conditions with water distributed across ponds rather than in a defined channel. **Anticipated level of CAR authorisation:** Registration.

Upstream from crossing location WC4

Watercourse crossing location WC4

Downstream from crossing location WC4



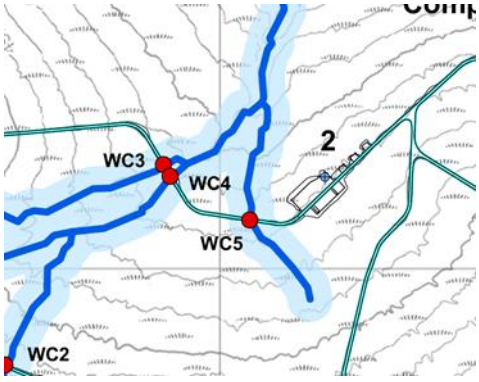
WC3, WC4 and WC5 location from Figure 8.6

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
WC5	274066	833110	Allt na Slanaich tributary 1:50,000 scale OS-mapped watercourse	Access track in central-west area of Site. Located ~200m south-east of WC4.	The topography at the chosen location is appropriate for a single span bottomless arch.	**Channel dimensions:** Flow is diffuse, with only a small surface water flow channel. At the time of the visit, visible water was approximately 0.4 m wide and 0.2 m deep in the main surface water channel. **Valley dimensions:** The feature is a U-shaped erosional gully within the peat, with banks approximately 1.5 m high. The distance between the top of the banks is around 25 m. **Substrate:** Dominantly vegetation, with patches of bare peat and localised areas of sands and gravels. **Channel form:** A meandering erosional peat gully. **Flow conditions:** Gentle flow observed during the visit, occurring under diffuse conditions with water distributed across ponds rather than in a defined channel. **Anticipated level of CAR authorisation:** Registration.

Upstream from crossing location WC5

Watercourse crossing location WC5

Downstream from crossing location WC5



WC3, WC4 and WC5 location from Figure 8.6

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
WC6	275839	834002	Allt na Loinne Moire 1:50,000 scale OS-mapped watercourse	Access track in north-east area of Site. Located ~70m west of eastern-most Site Compound.	The topography at the chosen location is appropriate for a single span bottomless arch.	**Channel dimensions:** Flow is confined within the channel, with a relatively substantial volume observed. At the crossing location, the visible channel was approximately 2 m wide and 0.2 m deep at the time of the visit. Upstream and downstream, the channel was deeper (~0.5 m), likely due to an existing track—possibly temporary—affecting flow depth at the crossing location. **Valley dimensions:** The feature is a gently meandering, V-shaped gully approximately 3 m deep. The distance between the top of the banks is around 3 m. The valley appears to be cut into sands, gravels, and glaciofluvial or alluvial deposits. **Substrate:** Dominantly sands, gravels, cobbles and boulders. **Channel form:** A gently meandering channel with defined bed and banks, shaped by flow through sands, gravels, and glaciofluvial or alluvial deposits. The existing track at the crossing point appears to have slightly raised the channel bed by building up material, reducing the overall depth of flow in this section compared to upstream and downstream areas. **Flow conditions:** Relatively substantial flow confined within the channel. At the time of the visit, flow depth was approximately 0.2 m at the crossing location, reduced due to the build-up of material from the existing track. Upstream and downstream of the crossing, flow depth was greater, reaching approximately 0.5 m, suggesting the track has locally altered the flow regime. Flow was steady and moderately fast-moving through the defined channel. **Anticipated level of CAR authorisation:** Registration.

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				

Upstream from crossing location WC6

Watercourse crossing location WC6

Downstream from crossing location WC6

WC6 location from Figure 8.6

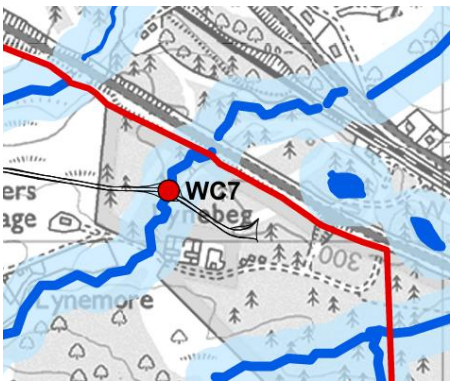
ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
WC7	276539	843085	Un-named watercourse 1:50,000 scale OS-mapped watercourse	Access track in north-east area of Site. Located ~695 m east of WC6.	The topography at the chosen location is appropriate for a single span bottomless arch.	**Channel dimensions:** Flow is confined within a gently meandering channel. At the crossing location, the channel was approximately 1.5 m wide and 0.3 m deep at the time of the visit. **Valley dimensions:** The channel itself forms the primary feature, with no distinct valley present. The banks are effectively at ground level, blending seamlessly with the surrounding terrain. **Substrate:** Predominantly vegetated, with some evidence of sands and gravels within the channel bed in localised areas. **Channel form:** A gently meandering channel with a shallow bed consisting of vegetation and occasional sands and gravels. The banks are indistinct and at ground level. The presence of a temporary track already crossing the watercourse has not significantly altered the form or flow. **Flow conditions:** Flow was steady and confined within the channel at the time of the visit. The existing track crossing does not appear to have significantly influenced flow conditions. **Anticipated level of CAR authorisation:** Registration.

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				

Upstream from crossing location WC7

Watercourse crossing location WC7

Downstream from crossing location WC7



WC7 location from Figure 8.6

Table 2 Examples of Erosional Peat Gulleys (Not shown on 1:50,000, 1:25,000 or 1:10,000 Scale OS Maps)

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
Examples of erosional peat gulleys that are not mapped.	Various	Various	N/A	Various across the site.	The topography at the chosen location is appropriate for a single span bottomless arch.	Various dimensions. Substrate: mostly peat or vegetation.

Erosional Peat Gulleys