Technical Appendix 8.4: Watercourse Crossing Assessment

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1.1 Introduction

1.1.1 As part of the Environmental Impact Assessment (EIA) process, it was identified that several new watercourse crossings would be required associated with access tracks for the Proposed Development and the upgrading/replacement of crossings may also be required. This Technical Appendix has been produced in order to meet the requirements of the Water Framework Directive (WFD)[1] as set out below.

1.1.2 The purpose of this Technical Appendix is to provide a conceptual assessment of watercourse crossings and to outline the strategic approach to proposed crossings. This Technical Appendix does not comment on the detailed engineering design. Post-consent of the Proposed Development, the Principal Contractor (the 'Contractor') would have overall responsibility for designing water crossings, for the production of a final Watercourse Crossing Plan and for compliance with Controlled Activity Regulations (CAR)[2] and the Scottish Environment Protection Agency's (SEPA) good practice guidance[3].

1.1.3 This Technical Appendix identifies the locations of proposed crossings and sets out the general principles of design which the Contractor would be required to follow in order to minimise changes to the hydrological regime and reduce any potential impacts on river morphology and aquatic ecology, without detailed baseline assessment of watercourses.

1.2 Legislation

1.2.1 The principal legislation with regard to the water environment is provided by the WFD which aims to protect and enhance the quality of surface freshwater (including lakes, rivers and streams), groundwater, Groundwater Dependent Terrestrial Ecosystems (GWDTEs), estuaries and coastal waters. The key objectives of the WFD relevant to this assessment are:

- to prevent deterioration and enhance aquatic ecosystems; and
- to establish a framework of protection of surface freshwater and groundwater.

1.2.2 The WFD has been transposed into Scottish legislation as the Water Environment and Water Services (Scotland) Act 2003 (WEWS Act)[4], which gives Scottish Ministers powers to introduce regulatory controls over water activities, in order to protect, improve and promote sustainable use of Scotland's water environment. The water environment includes wetlands, rivers, lochs, transitional waters (estuaries), coastal waters and groundwater. The CAR[2] came into force in 2011 and has since been amended in 2013 and 2017.

1.2.3 SEPA is the public body responsible for environmental protection in Scotland under both the Environment Act 1995 and the WEWS Act. Many SEPA policies relating to water are now delivered by the regulatory methods produced to implement the CAR. The CAR mean it is an offence to undertake the following activities with regard to watercourse crossings without an authorisation under the CAR:

- Discharges to all wetlands, surface waters and groundwaters (replacing the Control of Pollution Act 1974);
- Impoundments (dams and weirs) of rivers, lochs, wetlands and transitional waters; and
- Undertaking of engineering works in inland waters and wetlands.

1.2.4 Any proposed access track water crossings would therefore require authorisation under the CAR. This Technical Appendix takes into account guidance provided by SEPA with regards to the implementation of CAR[5].

1.2.5 In particular, Section 6 of the Water Environment Regulation Practical Guide[5] sets out that CAR requires authorisation for the carrying out of building or engineering works, or works other than impounding works in:

- Inland surface water (other than groundwater) or wetland; or
- In the vicinity of inland water or wetlands and having, or likely to have, a significant adverse impact on the water environment.

1.2.6 In order to allow for proportionate regulation based on the risk an activity poses to the water environment, there are three types of CAR authorisation: general binding rules, registrations and licences.

1.2.7 The SEPA Position Statement on Culverting of Watercourses (WAT-PS-06-02)[6] and Supporting Guidance on Sediment Management (WAT-SG-78)[7] have also been taken into account within this Technical Appendix, along with the supporting guidance provided in the River Crossings Good Practice Guide[8].

1.3 Identification of Watercourse Crossing Locations

1.3.1 Following a desk-based review of surface water features (based on OS 1:10,000 mapping and aerial imagery), the desk-based identification of surface water features was followed up with a site walkover which was conducted by Ramboll in April 2024, as presented in Annex 2. This field survey of likely crossings, based on the proposed alignment of track infrastructure for the Proposed Development, has been used to determine various watercourse characteristics in order to identify the likely level of CAR authorisation required. A total of nine potential watercourse crossings were identified, as presented in Table 9.1.1 below and shown on Annex 1, Figure 8.4.1.

Table 9.1.1: Watercourse Crossing Identification

WCC ID	Crossing Category	Description	Grid Reference	
			X	Y
WC1	New Crossing	Watercourse	290364	627257
WC2	New Crossing / Diversion	Drain	289616	626831
WC3	Existing Crossing	Watercourse	3288176	627350
WC4	New Crossing	Watercourse	289255	626367
WC5	Existing Culvert	Watercourse	290287	626237
WC6	New Crossing	Ephemeral Flow Path	289851	627133
WC7	New Crossing	Ephemeral Flow Path	289783	625440
WC8	New Crossing	Ephemeral Flow Path	289704	625487
WC9	New Crossing	Drain	291096	624457

1 The Water Framework Directive (WFD) (2000/60/EC)

2 Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR)

3 Scottish Government and SEPA, 2010. Engineering in the water environment: good practice guide: River crossings Version 2.

4 UK Government, 2003. Water Environment and Water Services (Scotland) Act 2003. Online: Available at: untitled (legislation.gov.uk)

5 SEPA (2019). The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide, Version 8.4, October 2019, https://www.sepa.org.uk/media/34761/car_a_practical_guide.pdf]

6 SEPA (2015), SEPA Position Statement to support the implementation of the Water Environment (Controlled Activities) (Scotland) Regulations 2011: WAT-PS-06-02: Culverting of Watercourses Position Statement and Supporting Guidance. Version 2.0, June 2015. https://www.sepa.org.uk/media/150919/wat_ps_06_02.pdf]

7 SEPA (2012), Supporting Guidance (WAT-SG-78) Sediment Management Authorisation (replacing WAT-PS-06-03), Version 1, December 2012, https://www.sepa.org.uk/media/151062/wat-sg-78.pdf

8 SEPA (2010), Engineering in the water environment: good practice guide: River crossings. Second edition, November 2010 https://www.sepa.org.uk/media/151036/wat-sg-25.pdf

1.4 Type of Crossing

1.4.1 Watercourse characteristics, both physical and ecological, will be matched to the most appropriate crossing type as part of detailed design. The potential crossing types typically considered are described below:

- Single span structures: recommended where there is a need to minimise disturbance to the bank and bed of the watercourse. Where it is possible to set back abutments from the watercourse, it is possible to maintain bank habitats under the crossing. Taking into account the maximum width of crossings to be undertaken on the Proposed Development, it is not anticipated that in-stream supports would be necessary at any crossings. Such crossings include half barrel culverts with a sufficient span to incorporate the existing bed and banks of watercourses;
- Bottomless Box/ Arches[9]: can be used where there are watercourses narrower than those appropriate for bridge construction, but which have a requirement to provide mammal and/ or fish passage and ensure sufficient hydraulic capacity during peak flow periods. Arches minimise disruption to the stream bed. Box culverts may incorporate mammal ledges and can be buried below stream bed level to enable bed material replacement;
- Circular Culverts: where potential impact is negligible due to the size, location or typology of the watercourse, circular culverts can be embedded into the channel to allow the natural bed to re-establish and, where necessary, provision can be made for mammals adjacent to the culvert. Where a circular culvert is utilised, it is assumed that neither natural bed material, nor water velocity nor depth are critical other than in the purely hydraulic sense; and
- Porous granular rock fill blanket and perforated pipes – where there is no clearly defined channel flow, flow can be maintained by a drainage blanket wrapped in geotextile placed below the road construction. Where such a crossing structure is utilised, flow is predominantly sub-surface interflow and a porous fill below the track provides flow continuity without concentrating the discharges into a narrow channel.

1.4.2 Generally bottomless culverts or single span bridges would be the preferred options for watercourses wherever feasible, in order to minimise alteration of the hydromorphology of watercourses and to reduce potential impact on aquatic habitats.

1.4.3 At locations where a culverted crossing is already in place or where drains or ephemeral flow paths have been recorded, it is likely that crossings will comprise circular culverts. At more natural, larger watercourses (WC1 and WC4) an open bottomed crossing would be utilised to maintain the natural bed of the watercourse.

1.5 Levels of CAR Authorisation

1.5.1 Regulatory and permitting requirements for the construction of watercourse crossings is set out by SEPA under CAR and assessment of the likely required permit levels is based on SEPA guidance[10]

General Binding Rules

1.5.2 General Binding Rules (GBRs) represent a set of mandatory rules which cover specific low risk activities. Activities complying with the rules do not require an application to be made to SEPA, as compliance with a GBR is considered to be compliance with an authorisation.

1.5.3 SEPA uses its statutory role in the land use planning system to highlight GBRs that may apply to a given proposal. The individual GBRs are described in more detail in the appropriate regime-specific sections of the Water Environment Regulation Practical Guide. The GBRs are numbered according to Schedule 3 of CAR.

Registrations

1.5.4 Registrations allow for the registration of small-scale activities that individually pose low environmental risk but, cumulatively, can result in greater environmental risk. The Contractor must apply to SEPA to register these activities. A registration will include details of the scale of the activity and its location, and there will be a number of conditions of registration that must be complied with.

Licences

1.5.5 These allow for site-specific conditions to be set to protect the water environment from activities that pose a higher risk. Licences can cover linked activities on a number of sites over a wide area, as well as single or multiple activities on a single site. SEPA has simple licences and complex licences for activities.

1.5.6 A key feature of CAR licences, unlike GBRs and registrations, is that they require an applicant to nominate a 'responsible person' (i.e., an individual/ partnership/ company) to be held accountable for securing compliance with the terms of the licence.

1.6 Proposed Development Likely Levels of CAR Authorisation

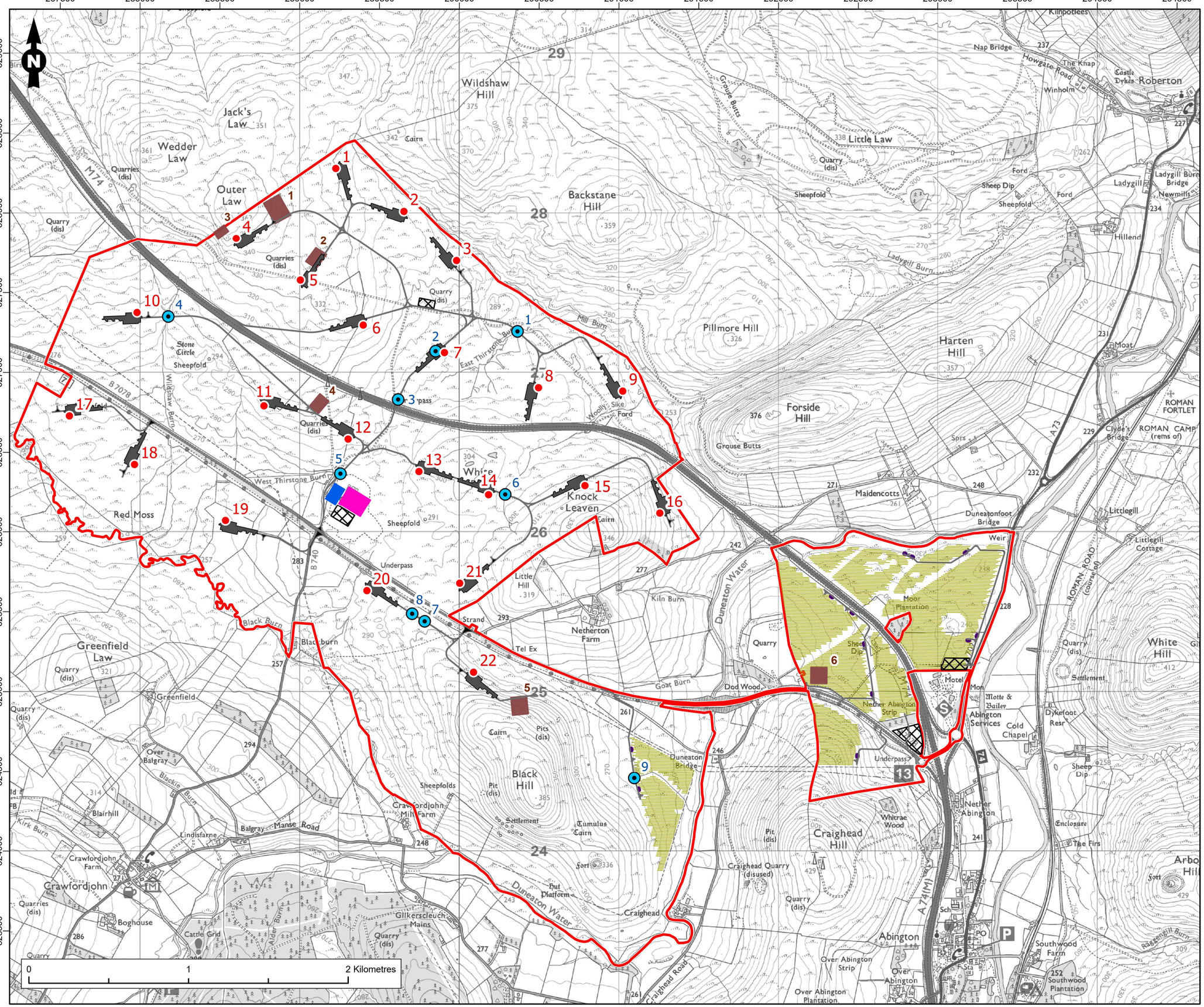
1.6.1 Based on assessment of the watercourses crossed by proposed access tracks it is anticipated that the following levels of authorisation would be required under CAR:

Table 9.1.2: Likely Levels of CAR Authorisation

WCC ID	Likely Level of CAR Authorisation	Basis of CAR Assessment	X	Y
WC1	Registration	Stream, 1.5-2 m in width, 0.5 m deep set in an incised channel. Gravel pebble bed.	336866	833064
WC2	GBR	Drain within quarry site, not shown on OS map (1:50K)	289851	627133
WC3	GBR	Existing crossing, circular culvert, not shown on OS map (1:50K)	289616	626831
WC4	Registration	Watercourse 0.8-0.5 m wide, approx. 0.5 m deep on silt/peat substrate, within wider ephemeral flow path	288176	627350
WC5	GBR	Currently culverted section of watercourse approx. 50 m in length including farm track and quarry track. GBR applicable provided there will be no increase in footprint (not anticipated)	289255	626367
WC6	Registration	Currently an ephemeral flow path with discernible flow over grassland habitat. No distinct hydromorphological characteristics of channel.	290287	626237
WC7	GBR	Cut drain/flow path. Not shown on OS mapping (1:50K)	289783	625440
WC8	GBR	Cut drain/flow path. Not shown on OS mapping (1:50K)	289704	625487
WC9	Registration	Cut drain, 05 m wide, approx. 0.3 m deep. A number of other cut drains are present in the surrounding area flowing from west to east	291096	624457

[9] Assessment of the suitability of culverting of watercourses and anticipated choice of culverting method follows WAT-PS-06-02: Culverting of Watercourses - Position Statement and Supporting Guidance. Available at: https://www.sepa.org.uk/media/150919/wat_ps_06_02.pdf

[10] SEPA, 2023. The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide, Version 9.3.. https://www.sepa.org.uk/media/dw5de0kh/car-a-practical-guide.pdf



Legend

- Site Boundary
- Solar PV Modules
- Inverter
- Substation
- Construction Compound
- Battery Site
- Borrow Pit Location
- Turbine Hardstanding Concrete
- Access Track, Junction & Turning Heads
- Watercourse Crossing

Figure Title	Watercourse Crossings
Project Name	M74 West Renewable Energy Park
Project Number	1620015684
Figure No.	8.4.1
Date	August 2024
Prepared By	BE
Scale	1:22,500 @A3
Issue	1
Client	**M74 West Ltd**

RAMBOLL

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Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.
1620015684-RAM-MA-IA-0000X_Fig8.4.1WatercourseCrossings_03.pagx