ScottishPower Renewables

Hare Hill Windfarm Repowering and Extension

Environmental Impact Assessment Report

Volume 3

Technical Appendix 9.1: Watercourse Crossing Assessment

November 2025

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Abbreviations

Abbreviation	Description
AEP	Annual Exceedance Probability
CAR	Controlled Activities (Scotland) Regulations 2011
CIRIA	Construction Industry Research and Information Association
CRP	Construction Runoff Permit
EASR	Environmental Authorisations (Scotland) Regulations 2018
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
GBR	General Binding Rules
OS	Ordnance Survey
SEPA	Scottish Environment Protection Agency
WEWS	Water Environment Water Services
WFD	Water Framework Directive

1. Introduction

1. This document provides a Schedule of Watercourse Crossings at the proposed Hare Hill Windfarm Repowering and Extension (the proposed Development) in support of **Chapter 9: Hydrology, Geology and Hydrogeology** of the Environmental Impact Assessment (EIA) Report. The purpose of this document is to provide the relevant information associated with the watercourse crossings required as part of the proposed Development and to assist in the identification of regulatory licensing requirements.

2. All the watercourse crossings are designed to maintain hydrology as well as, where necessary, allowing the free passage of mammals and aquatic species.

3. All new crossings will be able to convey 1 in 200-year flow volumes (plus an allowance for climate change) without constriction. Hydraulic modelling to demonstrate compliance would be undertaken prior to construction as part of the detailed drainage design.

4. Following the desk study for the proposed Development, forty-seven watercourse crossings were identified. However, site visits revealed that five of these forty-seven crossings did not actually correspond to active watercourses. The methodology, rationale and design and a detailed crossing assessment will be discussed further in the chapters to follow.

1.1. Regulatory Legislation

5. The assessment will consider the requirements of the Water Framework Directive (2000/60/EC) (WFD). The requirements of various EU Directives such as the WFD (2000/60/EC), the European Liability Directive (2004/35/EC) and the Groundwater Daughter Directive (2006/118/EC) have been transposed into domestic legislation following the United Kingdom leaving the EU by the Environment (EU Exit) (Scotland) (Amendment etc.) Regulations 2019 (the Environment Regulations 2019). The WFD, as retained in domestic legislation by the Environment Regulations 2019, and supporting domestic legislation establish a legal framework for the protection, improvement and sustainable use of surface waters, transitional waters, coastal waters and groundwater resources. The WFD aims to protect and enhance the quality of surface freshwater (including lakes, rivers and streams), groundwater, groundwater dependant terrestrial ecosystems, estuaries and coastal waters. The key objectives of the WFD relevant to the assessment are:

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

6. The WFD resulted in The Water Environment and Water Services (Scotland) (WEWS) Act 2003, which gave Scottish Ministers powers to introduce regulatory controls (Section 20 of WEWS) over water activities in order to protect, improve and promote sustainable use of Scotland's water environment. These regulatory controls, in the form of The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR) have made it an offence to undertake certain activities (as listed in Schedule 2) without a CAR authorisation.

7. As of November 2025, the Environmental Authorisations (Scotland) Regulations (EASR) will be implemented that will integrate and replace CAR in order to streamline and simplify the environmental permitting process in Scotland.

8. With respect to watercourse crossings required for the proposed Development, EASR requires that all 'engineering works in inland waters and wetlands' are subject to authorisation and allow for proportionate risk-based regulation. The process operates four levels of authorisation, as follows:

    - General Binding Rules (GBR);
    - Notifications,
    - Registration; and
    - Permits

9. The four levels cover activities with increasing levels of potential impact upon the hydrological environment. GBR represent a set of mandatory rules which cover low risk activities. Activities complying with GBR do not require an application to be made to the Scottish Environment Protection Agency (SEPA), as compliance with a GBR is considered to be compliance under an authorisation.

10. SEPA will be required to provide authorisation for watercourse crossing shown on the 1:50,000 scale Ordnance Survey (OS) maps. All watercourses major or minor are regulated under EASR if works include culverting for land gain, realignment, or diversion of watercourse and in these instances, authorisations are always required. Where appropriate, likely authorisations required for the surveyed crossings are described in this report.

11. It is also acknowledged that the more recent Water Environment (Miscellaneous) (Scotland) Regulations 2017 brought about significant changes to CAR and subsequently EASR, with sites exceeding certain thresholds now requiring a site construction license. Individual regulated activities, such as watercourse crossings, can either be considered as part of the construction runoff license or be individually authorised under the existing EASR requirements. Confirmation of this will be discussed and agreed with SEPA prior to construction taking place. This document is associated with identifying the licensing requirements for engineering works within the water environment only.

12. Advice and best practice guidance is available within the water engineering section of SEPA's website (SEPA, 2024a). Guidance on the design of water crossings can be found in the Construction of River Crossings Good Practice Guide (SEPA and Scottish Government (2010)). Reference should also be made to SEPA's Standing Advice on flood risk (SEPA, 2024b) which recommends that watercourse crossing should be designed to accommodate the 0.5% Annual Exceedance Probability (AEP) flows, or information provided to justify smaller structures.

1.2. Disclaimer

13. This report should be considered 'live', and as such, changes may be needed should new information come to light. Natural Power has endeavoured to identify the watercourse crossings required as part of the construction associated with the proposed Development. However, it is possible that additional watercourse crossings, which do

not feature on either the Ordnance Survey (OS) mapping or were not encountered during the site visit, will be identified within the site. Should the construction process identify additional crossings, then these should be surveyed, and due consideration given to the legislation above to ensure compliance.

14. The information presented in this document is only intended to act as a guide. The actual design, construction and/or improvements to the crossings during construction will be the responsibility of the appointed Principal Contractor.

2. Methodology

2.1. Desk Study

15. The desk study consisted of an examination of the infrastructure layout and the identification of watercourses which will require crossings, including those marked on the 1:10,000, 1:25,000 and 1:50,000 scale OS maps. A 50 m buffer is displayed in related figures and were applied to watercourses shown on a 1:10,000 scale OS map within the proposed Development boundary.

16. Details of the hydrological regime and associated flood risk affecting the proposed Development is presented in **Chapter 9** of the EIA Report.

2.2. Site Visit

17. Following the desk study, a survey of the identified crossings was undertaken to obtain information specific to each watercourse. Photographs and detailed field notes were taken, reporting the dimensions of the watercourse channel and flood channel (where apparent), the type of substrate and the existing crossing type, if applicable.

18. Watercourse surveys were undertaken in November and December 2024. The weather conditions during the surveys were variable. During the November site visit rainfall was concentrated through the morning with dry sunny spells following throughout the day. The December visit saw frosty dry conditions throughout the day. A plan indicating the site boundary and survey points is illustrated in EIA Report **Figure 9.1 Hydrology Overview**.

2.3. Water Crossing Selection Criteria

19. The design process adopted for each watercourse crossing is complex, taking account of a range of design criteria and constraints to develop the most appropriate crossing for each watercourse. The primary technical standards driving the design of culverts are DMRB: Drainage CD 529 Design of Outfall and Culvert Details (2021) and the CIRIA C786: Culvert, Screen and Outfall Manual (2019). However, in addition to these technical standards, there are other site-specific drivers that influence the culvert design which include among others: flood risk; maintenance requirements; ecological considerations; and geomorphological considerations. Reference should be made to the UK Forestry Standard Guidelines which focuses on engineering features, SEPA guidance documents for the construction considerations and Scottish Government guidance for best practice and ecology.

20. The design process for each watercourse crossing is iterative, such that the final design meets the fundamental design standard, which is that the proposed Development remains free from flooding during the design flood event whilst maintaining adequate freeboard (typically 600 mm) and flood risk is not exacerbated elsewhere.

21. SEPA has indicated that any larger bridges would need to be designed to accommodate a 1 in 200-year flood event plus an allowance for climate change, and that smaller watercourses should be oversized bottomless arch culverts (or traditional style bridges).

2.4. Watercourse Crossing Assessment Summary

22. Forty-five watercourse crossings were identified during the desk study as part of the proposed Development. The site visits brought to light that five out of the forty-five water crossings identified during the desk study were of watercourses with no discernible flow. A summary of the number of each CAR level of authorisation that are likely to be required are summarised in **Table 2.4.1**.

Table 2.4.1: Summary of Actual Watercourse Crossings

EASR Authorisation Level	Number of Crossings
Registration	21
GBR	20
Total	**41**

Source: Natural Power

23. **Table 2.4.2** provides a summary of the surveyed natural watercourses, including the proposed crossing type and EASR authorisation level.

Table 2.4.2: Summary of the Proposed Watercourse Crossing Types and EASR Authorisation Level

ID	Easting	Northing	Type	EASR Authorisation Level
WX1	265244	608966	New	GBR
WX2	265266	605657	New	Registration
WX3	265412	606208	New	GBR
WX4	265430	606268	New	Registration
WX5	265435	606994	New	GBR
WX6	265439	607015	New	GBR
WX7	265443	606967	New	GBR
WX8	265462	606334	New	Registration
WX9	265464	606915	New	Registration
WX10	265483	605135	New	GBR
WX11	265491	609456	New	GBR
WX12	265577	609344	Existing (upgraded)	GBR
WX13	265612	605070	New	Registration
WX14	265697	605052	New	Registration
WX15	265809	609327	New	GBR
WX16	265887	605103	New	Registration

WX17	266026	609262	Existing (upgraded)	GBR
WX18	266041	612896	Existing (upgraded)	GBR
WX19	266108	612874	Existing (upgraded)	Registration
WX20	266147	609305	New	GBR
WX21	266163	609799	New	GBR
WX22	266170	608427	New	GBR
WX23	266197	608419	New	GBR
WX24	266267	605487	New	Registration
WX25	266324	605363	N/A	None
WX26	266352	607812	New	Registration
WX27	266360	612784	Existing (upgraded)	GBR
WX28	266576	612586	Existing (upgraded)	Registration
WX29	266682	605791	New	Registration
WX30	266719	608425	New	GBR
WX31	266899	612525	Existing (upgraded)	Registration
WX32	266951	606177	New	Registration
WX33	267030	606395	New	GBR
WX34	267045	606469	New	GBR
WX35	267063	612443	Existing (upgraded)	Registration
WX36	267094	612437	N/A	None
WX37	267197	609685	N/A	None
WX38	267204	612397	Existing (upgraded)	Registration
WX39	267212	606854	N/A	None
WX40	267291	607070	New	Registration
WX41	267331	607000	New	Registration
WX42	267525	611855	N/A	None
WX43	267717	607281	New	Registration

WX44	267934	611594	Existing (upgraded)	Registration
WX45	266133	611782	New	Registration
Note: EASR Authorisations classified as a "registration" are identified as a watercourse or water body on an OS Landranger 1:50,000 scale series.				

Source: Natural Power

24. The location of the watercourse crossings in relation to the proposed infrastructure is provided in **Volume 2 Figure 9.1**. More detailed information on the watercourse crossings are provided in **Section 4** and takes into account the preceding information, as well as photographs and hydro-morphological information associated with each crossing.

25. In addition to the EASR authorisations summarised in **Section 2.4.1**, the proposed Development will also require an EASR Construction Runoff Permit (CRP) to meet SEPA's permitting principles and must be obtained prior to construction. This is due to the following criteria:

26. "Construction Site that discharge water run-off to the water environment and:

- Cover and area greater than 4 hectares; or
- Contain a road (or track) greater than 5 kilometres in length; or
- Include any land with an area greater than 1 hectare that has slope more than 25 degrees; or
- Include any road (or track) with a length greater than 500 metres that has a slope more than 25 degrees."

3. Rationale and Design

27. The design of the proposed Development has been optimised as far as possible to reduce the total area of land-take and minimise the number of watercourse crossings whilst accommodating other environmental or engineering related constraints. At each watercourse crossing location, consideration has been given to the nature and size of the crossing, fluvial scour and environmental requirements.

28. In designing the watercourse crossings, industry good practice will be applied, ensuring that various conditions will be considered during the works, and which are summarised below:

- All watercourses, over which the access tracks cross, will be routed through circular culverts, bottomless arch culverts or under bridges appropriately sized and designed not to impede the flow of water;
- Safe passage for wildlife, such as fish, water voles, otters etc. will also be considered in the design through increased capacity of culvert or separate mammal crossing (pipe);
- When constructing culverts, the appointed Principal Contractor takes care to ensure that the construction does not pose a permanent obstruction to migrating species of fish, or riparian mammals;

- If instream works are planned in a watercourse supporting trout/salmon then such works should avoid taking place between October – May to protect spawning redds. Also, a fish rescue by electrofishing should take place prior to instream works in fish supporting watercourses. Final arrangements would be clarified with the Galloway Fisheries Trust;
- Culvert design will be engineered to ensure that the invert can be sunk into the bed of the watercourse allowing riverine substrate to stabilise on the floor of the culvert;
- Designed to convey a minimum of 1 in 200 year plus climate change return period flood events, and individually sized and designed to suit the specific requirements and constraints of its location. For larger crossings such as single span structures, a minimum freeboard of 0.6 m above the 1 in 200 flow must also be incorporated; and
- All watercourse crossings to include splash boards and run-off diversion measures to prevent any direct siltation of watercourses.

29. Erosion protection will be implemented at the outfall of all culverts. Where required, the type of erosion protection would depend on a number of factors including:

- Flow;
- Velocity;
- Channel bed material;
- Vegetation;
- The effects/consequences of erosion; and
- Types of erosion protection including:
  - Geotextile bank reinforcement;
  - Vegetation;
  - Dumped stone;
  - Laid stone (Rip-rap or equivalent); and
  - Concrete block systems.

30. The appointed Principal Contractor will adhere to the following principles for culvert design and construction:

- Where appropriate, the natural low flow depths are maintained through culvert base;
- The culvert base should be buried below the natural bed level to allow for a naturalised culvert bed to be maintained during scour associated with high flow events;
- The culvert should be at least the same width as the natural active channel width, with consideration to low flows and channel migration;
- Culvert alignment should match alignment of the watercourse i.e. in a parallel direction to flow;

- The slope of the culvert base should be similar to that of the bed of the watercourse;
- The culvert must not present a barrier by creating a step or hydraulic drop at the culvert inlet or outlet;
- The culvert must be designed not to exacerbate or create flooding;
- A natural stone headwall should be provided upstream and downstream to protect the road embankment where necessary;
- Culverts should not be constructed under high flow conditions; and
- A mammal tunnel should be provided where considered appropriate by the Ecological Clerk of Works (ECoW), so that no restriction is related to established animal movement routes.

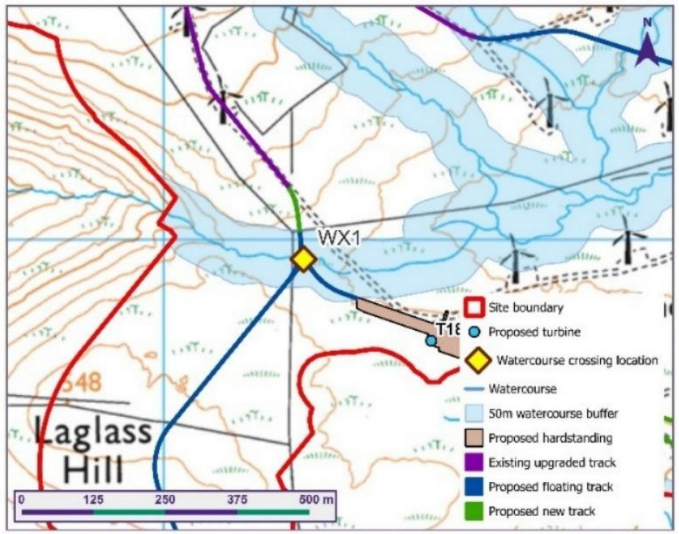
31. Following the completion of detailed site investigation and micro-siting, a revised version of this assessment should be produced to estimate peak flows in the watercourses. Peak flows need to be accommodated to ensure that any potential risk to flooding is minimised. Due to the small size of the catchments, and it being unlikely that local flow data will exist, in line with SEPA guidance, a number of techniques should be presented in the estimation of peak flows. These estimated peak flows will help inform the detailed design considerations required for each of the identified crossing locations. An indication of the required sizing for crossing dimensions would also be provided.

4. Detailed Crossing Assessment

32. Tables 4.1 to 4.45 include details of all the potential watercourse crossings identified as part of the desk study, together with photographs, site notes and a recommendation of the crossing type to be used. Note that five of the potential watercourse crossing locations (WX25, WX36, WX37, WX39 & WX42) did not actually correspond with active watercourses.

Table 4.1 WX1 Detailed Assessment

WX1 (265244, 608966)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Artificial drainage channel
- **Gradient:** Gentle
- **Valley form:** No obvious valley sides
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Vegetation, Peat
- **Riparian corridor:** Moorland
- **Flow condition:** Very slow

- **Water width (m):** 0.11
- **Water depth (m):** 0.07
- **Bankfull width (m):** 0.32
- **Bankfull height (m):** 0.12
- **Banktop height (m):** 0.12
- **Flooded Bankfull width (m):** 0.44
- **Flooded Bankfull height:** 0.15

Present on 1:50,000 scale OS map? No
Note: None.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

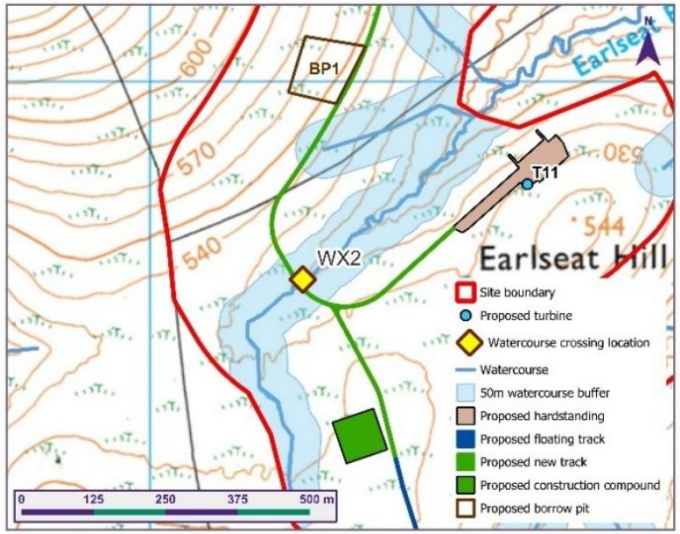
Upstream

Across

Downstream

Table 4.2 WX2 Detailed Assessment

WX2 (265266, 605657)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Deep vee
- **Bank condition:** Stable
- **Bed material:** Coarse gravel, Rounded pebbles, Boulders
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.50
- **Water depth (m):** 0.20
- **Bankfull width (m):** 0.80
- **Bankfull height (m):** 0.40
- **Banktop height (m):** 2.50
- **Flooded Bankfull width (m):** 2.00
- **Flooded Bankfull height:** 1.00

Present on 1:50,000 scale OS map? Yes
Note: Substantial channel, may require a bridge or track relocation
EASR Auth Level: Registration
Proposed Crossing Type: The stream is located within a deep valley, where a small conventional bridge could provide the most effective watercourse crossing.

Crossing Photographs

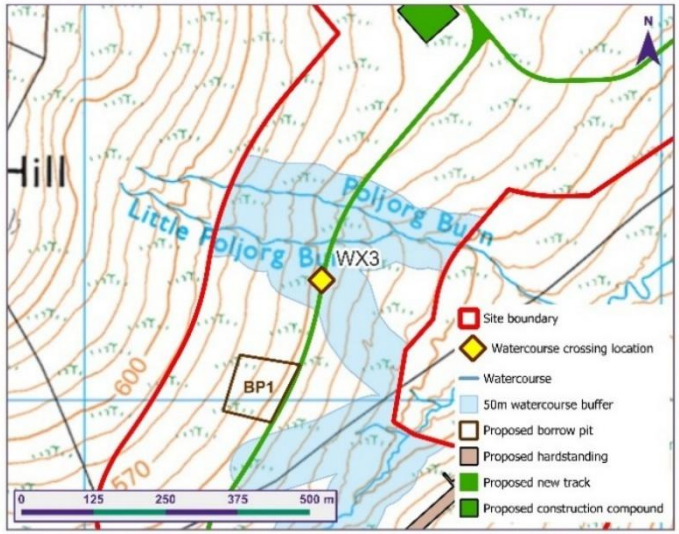
Upstream

Across

Downstream

Table 4.3 WX3 Detailed Assessment

WX3 (265412, 606208)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Poorly defined
- **Gradient:** Moderate
- **Valley form:** Shallow vee
- **Bank condition:** N/A
- **Bed material:** Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Stagnant

- **Water width (m):** 0.10
- **Water depth (m):** 0.10
- **Bankfull width (m):** 0.30
- **Bankfull height (m):** 0.15
- **Banktop height (m):** -
- **Flooded Bankfull width (m):** 0.50-1.00
- **Flooded Bankfull height:** 0.25

Present on 1:50,000 scale OS map? No
Note: Vegetated channel with some stagnant water but no flow. On day of survey this is not a watercourse but during wet conditions there could be some surface run off flow
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

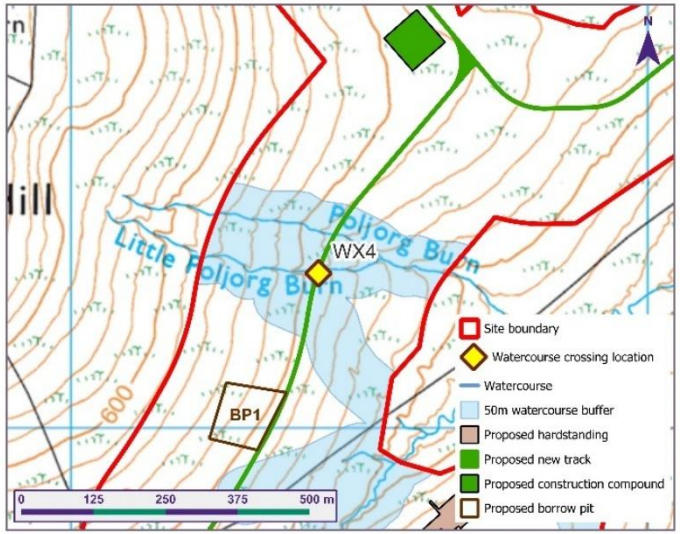
Upstream

Across

Downstream

Table 4.4 WX4 Detailed Assessment

WX4 (265430, 606268)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Steep
- **Valley form:** Gorge
- **Bank condition:** Stable
- **Bed material:** Rounded pebbles, Coarse gravel, Boulders, Bedrock
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.80
- **Water depth (m):** 0.10
- **Bankfull width (m):** 1.20
- **Bankfull height (m):** 0.30
- **Banktop height (m):** 3.00-4.00
- **Flooded Bankfull width (m):** 1.50-2.00
- **Flooded Bankfull height:** 1.00

Present on 1:50,000 scale OS map? Yes
Note: Substantial Gorge
EASR Auth Level: Registration
Proposed Crossing Type: The surveyor noted that there is a substantial gorge at this location which will require a bridge crossing or track relocation.

Crossing Photographs

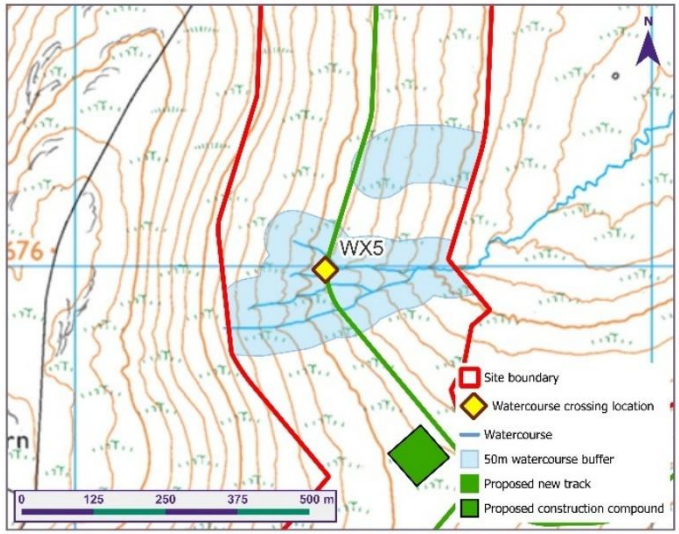
Upstream

Across

Downstream

Table 4.5 WX5 Detailed Assessment

WX5 (265435, 606994)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Steep
- **Valley form:** Deep vee
- **Bank condition:** Stable
- **Bed material:** Coarse gravel, Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.20
- **Water depth (m):** 0.20
- **Bankfull width (m):** 0.30
- **Bankfull height (m):** 0.25
- **Banktop height (m):** -
- **Flooded Bankfull width (m):** 0.50-1.00
- **Flooded Bankfull height:** 0.30-0.40

Present on 1:50,000 scale OS map? No
Note: Watercourse contained in a small gully.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

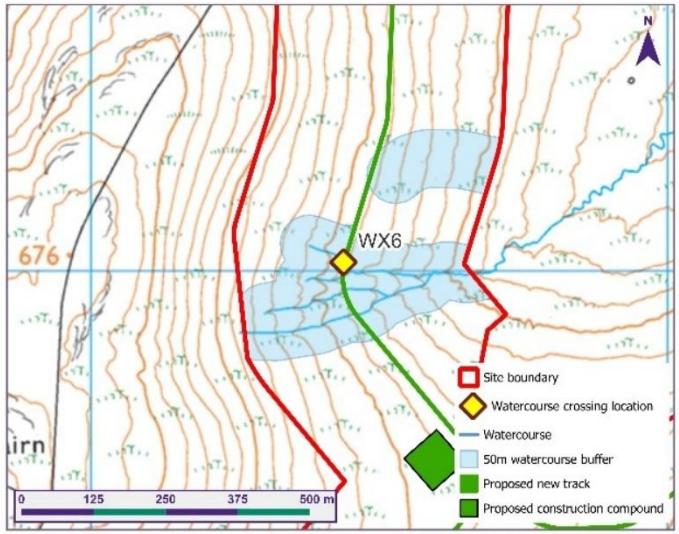
Upstream

Across

Downstream

Table 4.6 WX6 Detailed Assessment

WX6 (265439, 607015)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Poorly defined
- **Gradient:** Moderate
- **Valley form:** Shallow vee
- **Bank condition:**
- **Bed material:** Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Stagnant

- **Water width (m):** 0.10
- **Water depth (m):** 0.10
- **Bankfull width (m):** 0.30
- **Bankfull height (m):** 0.15
- **Banktop height (m):** -
- **Flooded Bankfull width (m):** 0.50-1.00
- **Flooded Bankfull height:** 0.25

Present on 1:50,000 scale OS map? No
Note: Small watercourse, mostly vegetated.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

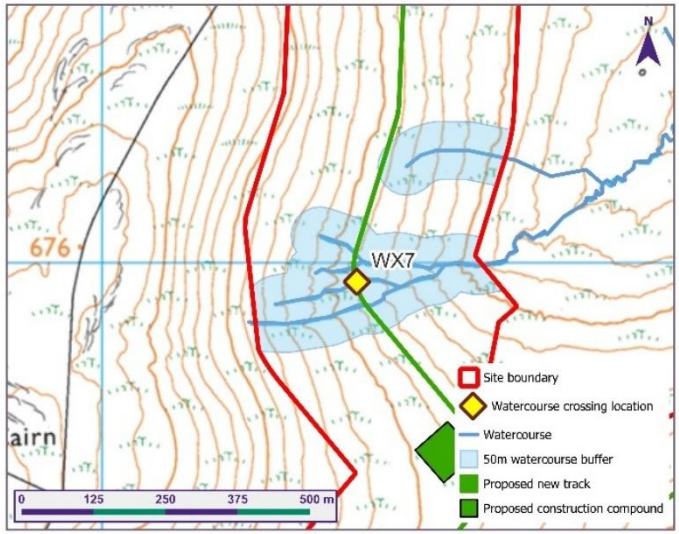
Upstream

Across

Downstream

Table 4.7 WX7 Detailed Assessment

WX7 (265443, 606967)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Steep
- **Valley form:** Deep vee
- **Bank condition:** Stable
- **Bed material:** Coarse gravel, Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.30
- **Water depth (m):** 0.08
- **Bankfull width (m):** 0.80
- **Bankfull height (m):** 0.20
- **Banktop height (m):** -
- **Flooded Bankfull width (m):** 1.00-2.00
- **Flooded Bankfull height:** 0.30

Present on 1:50,000 scale OS map? No
Note: Watercourse contained in gully, with eroded banks 25 m upstream showing evidence of frequent flooding.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

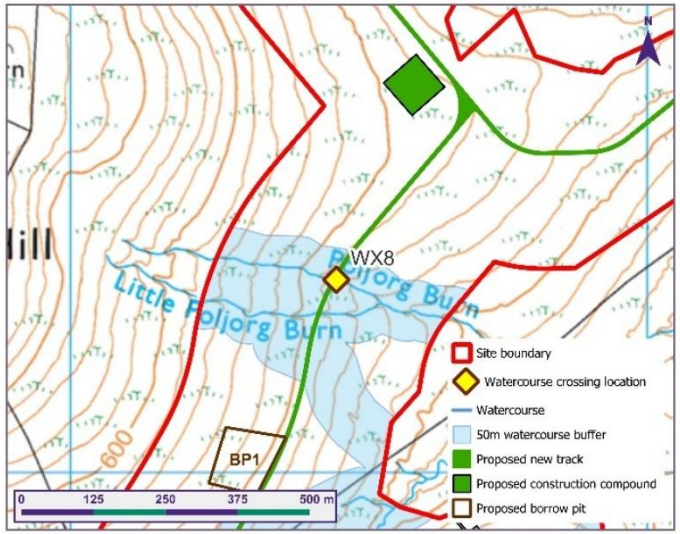
Upstream

Across

Downstream

Table 4.8 WX8 Detailed Assessment

WX8 (265462, 606334)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Deep vee, Gorge
- **Bank condition:** Stable
- **Bed material:** Fine sand/silt, Rounded pebbles, Coarse gravel, Boulders, Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.80
- **Water depth (m):** 0.20
- **Bankfull width (m):** 1.00
- **Bankfull height (m):** 0.40
- **Banktop height (m):** 2.50
- **Flooded Bankfull width (m):** 1.50
- **Flooded Bankfull height:** 0.50

Present on 1:50,000 scale OS map? Yes
Note: Watercourse within small gully channel, may require a small bridge or track relocation 30 m upstream.
EASR Auth Level: Registration
Proposed Crossing Type: The stream is located within a deep valley, where a small conventional bridge could provide the most effective watercourse crossing.

Crossing Photographs

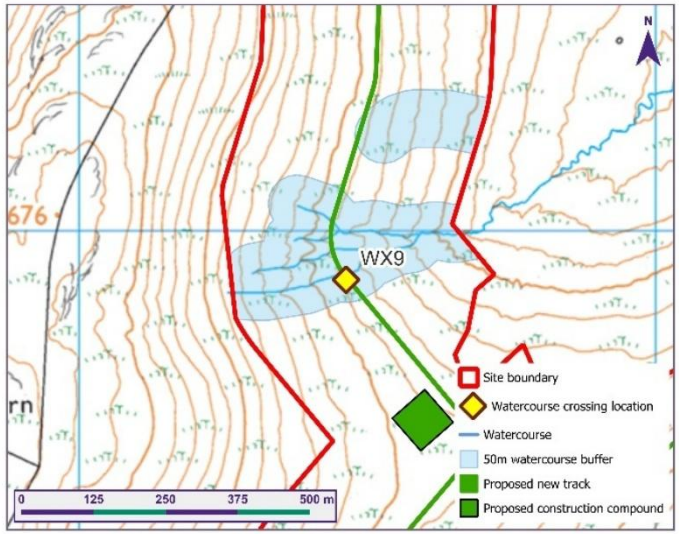
Upstream

Across

Downstream

Table 4.9 WX9 Detailed Assessment

WX9 (265464, 606915)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Steep
- **Valley form:** Shallow vee, Deep vee
- **Bank condition:** Stable
- **Bed material:** Fine sand/silt, Rounded pebbles, Coarse gravel, Boulders, Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.80
- **Water depth (m):** 0.10
- **Bankfull width (m):** 1.20
- **Bankfull height (m):** 0.20
- **Banktop height (m):**
- **Flooded Bankfull width (m):** 1.50-2.00
- **Flooded Bankfull height:** 0.30

Present on 1:50,000 scale OS map? Yes
Note: None
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

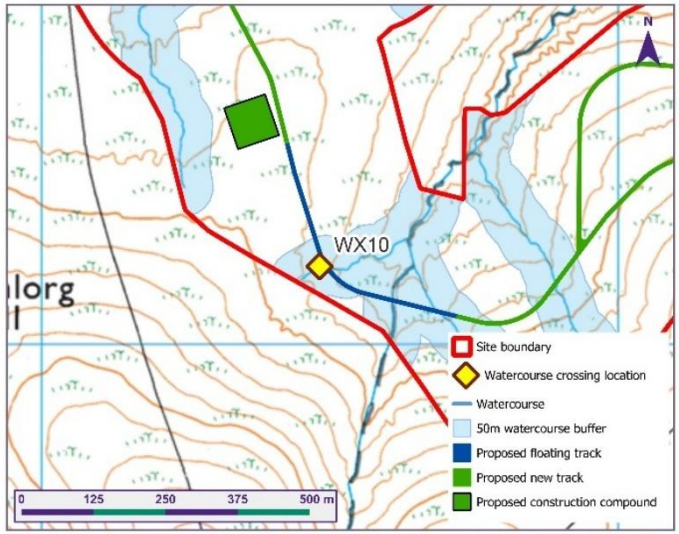
Upstream

Across

Downstream

Table 4.10 WX10 Detailed Assessment

WX10 (265483, 605135)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Shallow vee, Deep vee
- **Bank condition:** Stable
- **Bed material:** Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.10
- **Water depth (m):** 0.05
- **Bankfull width (m):** 0.30
- **Bankfull height (m):** 0.20
- **Banktop height (m):** 2.00
- **Flooded Bankfull width (m):** 1.50-2.00
- **Flooded Bankfull height:** 0.30

Present on 1:50,000 scale OS map? No
Note: Channel mostly obscured by vegetation but can hear the water flow.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

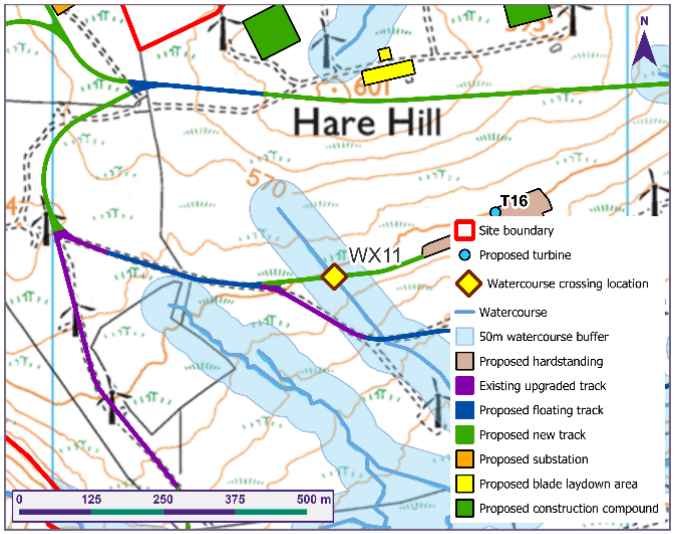
Upstream

Across

Downstream

Table 4.11 WX11 Detailed Assessment

WX11 (265491, 609456)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Poorly defined, Artificial drainage channel
- **Gradient:** Steep
- **Valley form:** No obvious valley sides
- **Bank condition:** Unstable (potential recent collapse)
- **Bed material:** Rounded pebbles, Coarse gravel, Boulders, Vegetation, Peat, Soil
- **Riparian corridor:** Moorland
- **Flow condition:** Slow

- **Water width (m):** 0.11
- **Water depth (m):** 0.04
- **Bankfull width (m):** 0.81
- **Bankfull height (m):** 0.22
- **Banktop height (m):** 0.22
- **Flooded Bankfull width (m):** 1.24
- **Flooded Bankfull height:** 0.31

Present on 1:50,000 scale OS map? No
Note: Seems to be a large drainage ditch.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

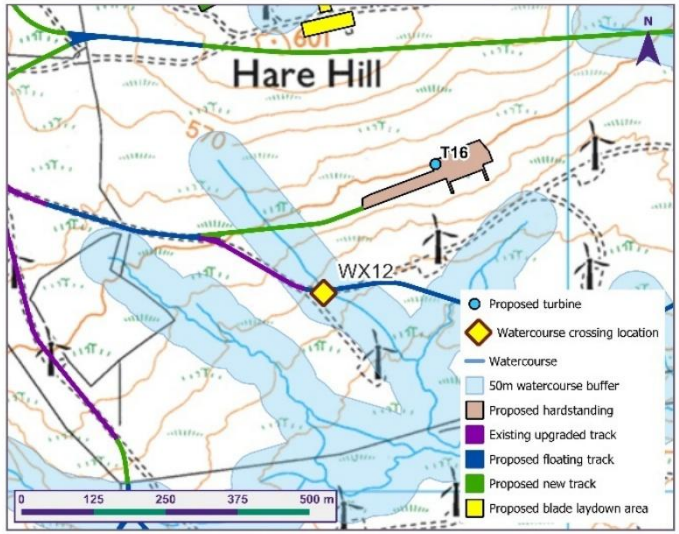
Upstream

Across

Downstream

Table 4.12 WX12 Detailed Assessment

WX12 (265577, 609344)	
Crossing Location	Crossing Description



- **Existing Crossing:** Yes
- **Crossing Type (existing):** Circular Culvert
- **Crossing Material (existing):** Plastic
- **Crossing Condition (existing):** Good
- **Channel Type:** Artificial drainage channel
- **Gradient:** Moderate
- **Valley form:** Gorge
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Boulders, Coarse gravel, Rounded pebbles, Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate
- **Culvert Dimensions (m):** 0.59
- **Water width (m):** 0.42
- **Water depth (m):** 0.06
- **Bankfull width (m):** 0.86
- **Bankfull height (m):** 0.19
- **Banktop height (m):** 0.19
- **Flooded Bankfull width (m):** 1.09
- **Flooded Bankfull height:** 0.25

Present on 1:50,000 scale OS map? No
Note: Culvert slightly bent on the bottom at the exit end
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

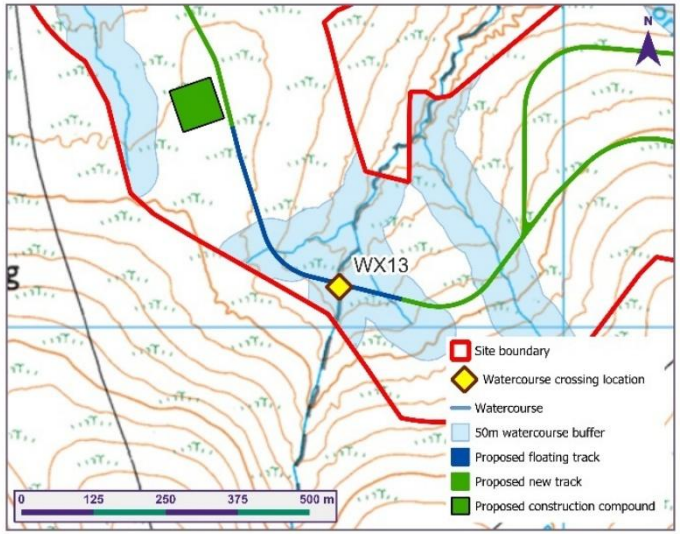
Upstream

Across

Downstream

Table 4.13 WX13 Detailed Assessment

WX13 (265612, 605070)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Gorge, Deep vee
- **Bank condition:** Stable
- **Bed material:** Rounded pebbles, Coarse gravel, Boulders
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 1.00
- **Water depth (m):** 0.25
- **Bankfull width (m):** 1.30
- **Bankfull height (m):** 0.35
- **Banktop height (m):** 4.00
- **Flooded Bankfull width (m):** 1.50
- **Flooded Bankfull height:** 0.50

Present on 1:50,000 scale OS map? Yes
Note: Substantial channel may require a bridge or relocate track.
EASR Auth Level: Registration
Proposed Crossing Type: The stream is located within a deeply incised valley, where a conventional bridge could provide the most effective watercourse crossing.

Crossing Photographs

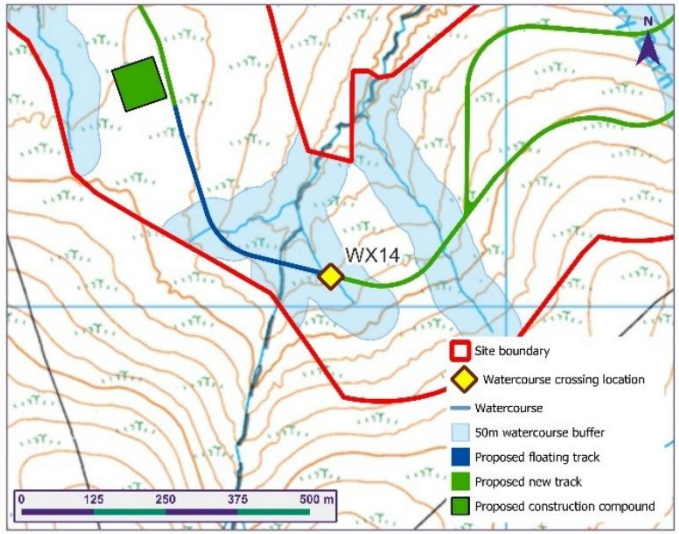
Upstream

Across

Downstream

Table 4.14 WX14 Detailed Assessment

WX14 (265697, 605052)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Deep vee
- **Bank condition:** Stable
- **Bed material:** Rounded pebbles, Coarse gravel, Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.30
- **Water depth (m):** 0.10
- **Bankfull width (m):** 0.40
- **Bankfull height (m):** 0.20
- **Banktop height (m):** 2.50
- **Flooded Bankfull width (m):** 1.50-2.00
- **Flooded Bankfull height:** 0.50

Present on 1:50,000 scale OS map? Yes
Note: Deep Channel
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

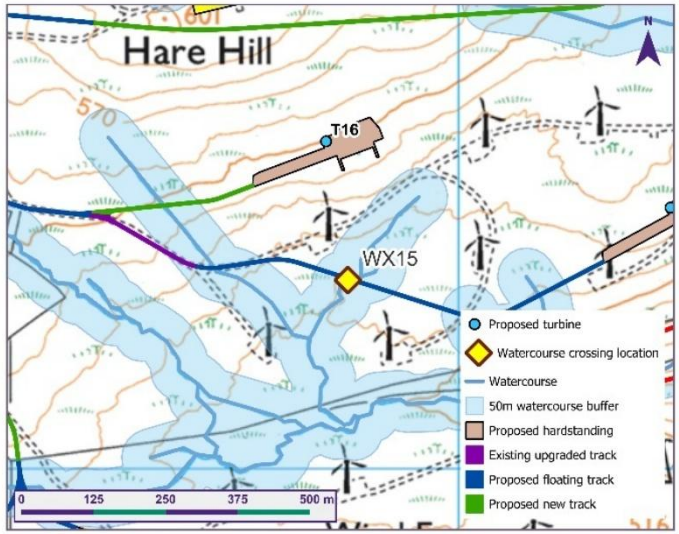
Upstream

Across

Downstream

Table 4.15 WX15 Detailed Assessment

WX15 (265809, 609327)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** None evident
- **Gradient:** Gentle
- **Valley form:** No obvious valley sides
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Vegetation
- **Riparian corridor:** Heavily Vegetated (e.g. gorse, bramble)
- **Flow condition:** N/A

- **Water width (m):** 1.59
- **Water depth (m):** N/A
- **Bankfull width (m):** N/A
- **Bankfull height (m):** N/A
- **Banktop height (m):** N/A
- **Flooded Bankfull width (m):** N/A
- **Flooded Bankfull height:** N/A

Present on 1:50,000 scale OS map? No
Note: No flow evident during site visit. Heavily vegetated. Possible artificial ditch
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

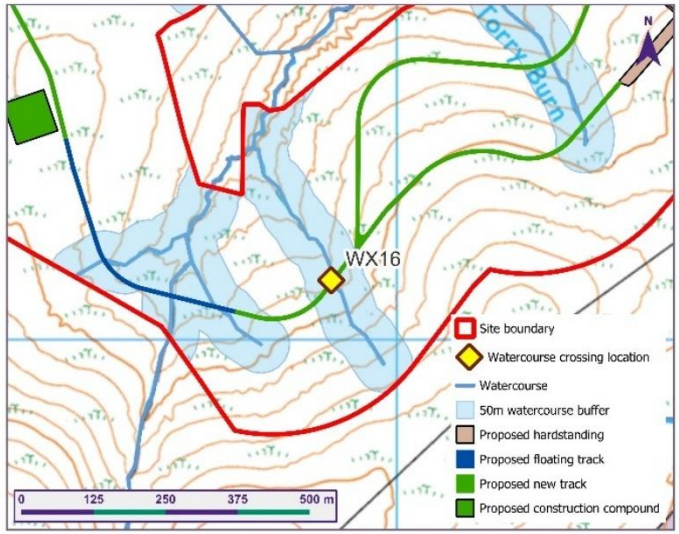
Upstream

Across

Downstream

Table 4.16 WX16 Detailed Assessment

WX16 (265887, 605103)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Surface run-off/wetlands only, Poorly defined
- **Gradient:** Moderate
- **Valley form:** Shallow vee, No obvious valley sides
- **Bank condition:** Stable
- **Bed material:** Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Very slow

- **Water width (m):** 0.50
- **Water depth (m):** 0.05
- **Bankfull width (m):** 0.80
- **Bankfull height (m):** 0.20
- **Banktop height (m):** -
- **Flooded Bankfull width (m):** 1.00-2.00
- **Flooded Bankfull height:** 0.30

Present on 1:50,000 scale OS map? Yes
Note: Wet flush, no real channel or flow, but could have in wet conditions
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

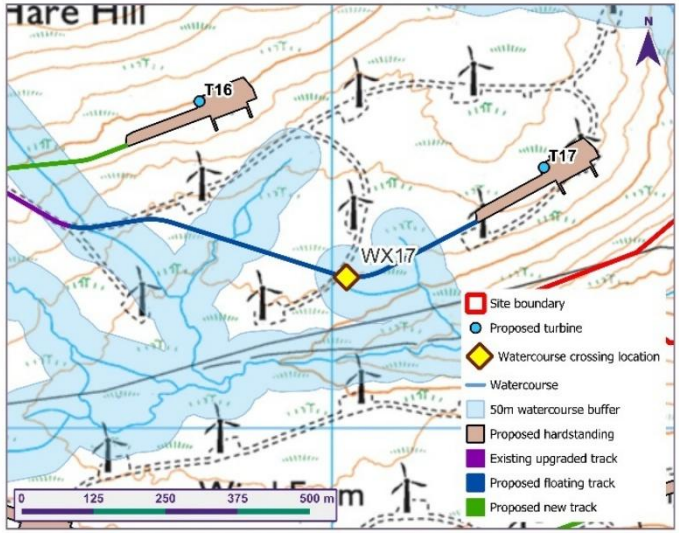
Upstream

Across

Downstream

Table 4.17 WX17 Detailed Assessment

WX17 (266026, 609262)	
Crossing Location	Crossing Description



- **Existing Crossing:** Yes
- **Crossing Type (existing)**: Circular Culvert
- **Crossing Material (existing)**: Plastic
- **Crossing Condition (existing)**: Average
- **Channel Type:** Poorly defined, Incised
- **Gradient:** Gentle
- **Valley form:** No obvious valley sides
- **Bank condition:** Stable
- **Bed material:** Vegetation
- **Riparian corridor:** Heavily Vegetated (e.g. gorse, bramble), Moorland
- **Flow condition:** Slow
- **Culvert Dimensions (m)**: 0.31
- **Water width (m):** 0.42
- **Water depth (m):** 0.08
- **Bankfull width (m):** 0.78
- **Bankfull height (m):** 0.14
- **Banktop height (m):** 0.14
- **Flooded Bankfull width (m):** 1.16
- **Flooded Bankfull height:** 0.21

Present on 1:50,000 scale OS map? No
Note: Heavily vegetated upstream.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, an upgraded circular culvert is recommended.

Crossing Photographs

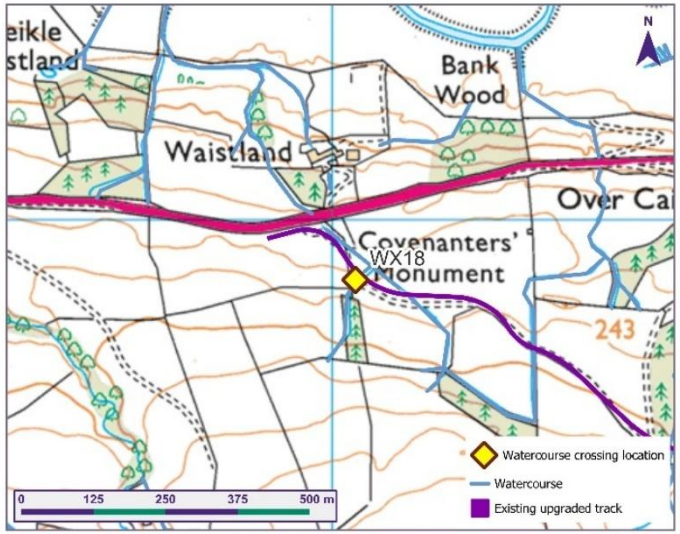
Upstream

Across

Downstream

Table 4.18 WX18 Detailed Assessment

WX18 (266041, 612896)	
Crossing Location	Crossing Description



- **Existing Crossing:** Yes
- **Crossing Type (existing)**: Circular Culvert
- **Crossing Material (existing)**: Plastic
- **Crossing Condition (existing)**: Poor
- **Channel Type:** Poorly defined, Incised
- **Gradient:** Moderate
- **Valley form:** Shallow vee
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Rounded pebbles, Coarse gravel, Vegetation
- **Riparian corridor:** Heavily Vegetated (e.g. gorse, bramble), Moorland, Agricultural Grazing
- **Flow condition:** Moderate
- **Culvert Dimensions (m)**: 0.34
- **Water width (m):** 0.17
- **Water depth (m):** 0.08
- **Bankfull width (m):** 0.65
- **Bankfull height (m):** 0.13
- **Banktop height (m):** 0.13
- **Flooded Bankfull width (m):** 0.72
- **Flooded Bankfull height:** 0.19

Present on 1:50,000 scale OS map? No
Note: Large hydraulic drop down of the channel flow upon exit of the culvert.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

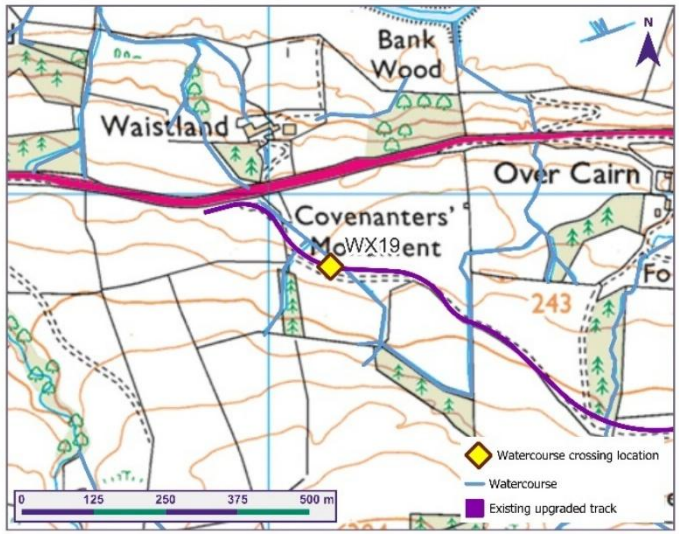
Upstream

Across

Downstream

Table 4.19 WX19 Detailed Assessment

WX19 (266108, 612874)	
Crossing Location	Crossing Description



- **Existing Crossing:** Yes
- **Crossing Type (existing)**: Circular Culvert
- **Crossing Material (existing)**: Plastic
- **Crossing Condition (existing)**: Average
- **Channel Type:** Poorly defined, Incised
- **Gradient:** Moderate
- **Valley form:** Shallow vee
- **Bank condition:** Stable
- **Bed material:** Rounded pebbles, Coarse gravel, Boulders, Vegetation
- **Riparian corridor:** Moorland, Agricultural Grazing
- **Flow condition:** Moderate
- **Culvert Dimensions (m)**: 0.45
- **Water width (m):** 0.30
- **Water depth (m):** 0.08
- **Bankfull width (m):** 0.55
- **Bankfull height (m):** 0.13
- **Banktop height (m):** 0.13
- **Flooded Bankfull width (m):** 1.3
- **Flooded Bankfull height:** 0.20

Present on 1:50,000 scale OS map? Yes
Note: Culvert is topped by vegetation seems to be a concrete trough on exit of the culvert.
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

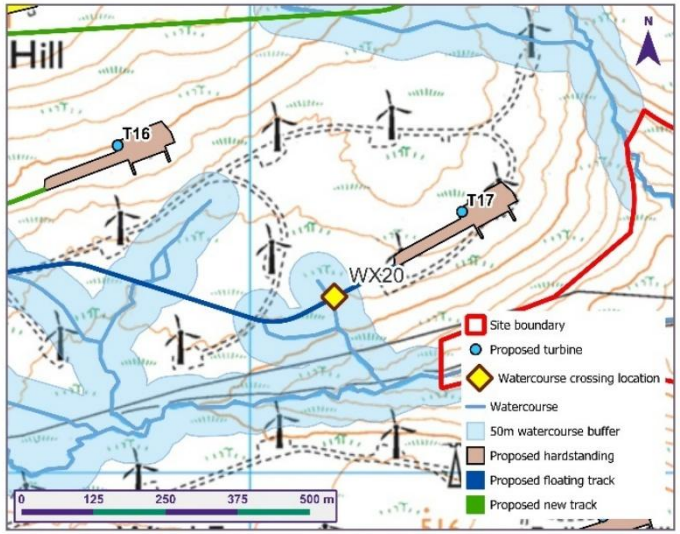
Upstream

Across

Downstream

Table 4.20 WX20 Detailed Assessment

WX20 (266147, 609305)	
Crossing Location	Crossing Description



- **Existing Crossing:** No
- **Channel Type:** Poorly defined
- **Gradient:** Gentle
- **Valley form:** Shallow vee
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Rounded pebbles, Vegetation, Peat
- **Riparian corridor:** Moorland
- **Flow condition:** Slow

- **Water width (m):** 0.21
- **Water depth (m):** 0.03
- **Bankfull width (m):** 0.39
- **Bankfull height (m):** 0.11
- **Banktop height (m):** 0.11
- **Flooded Bankfull width (m):** 0.57
- **Flooded Bankfull height:** 0.17

Present on 1:50,000 scale OS map? No
Note: Indicative of an artificially drained channel.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

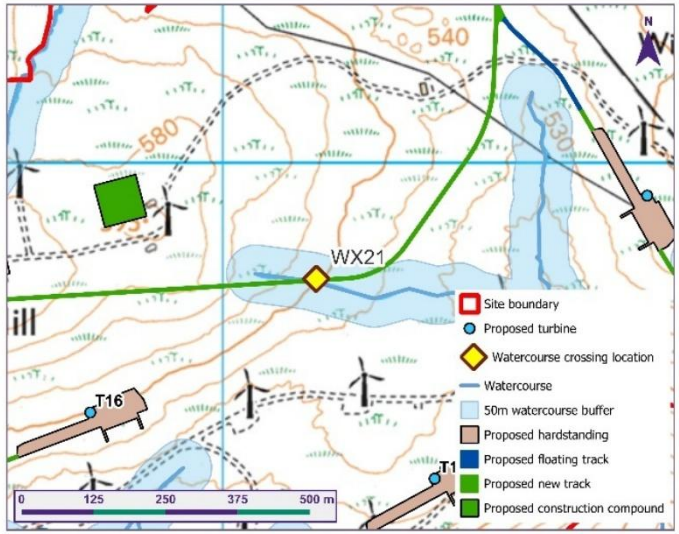
Upstream

Across

Downstream

Table 4.21 WX21 Detailed Assessment

WX21 (266163, 609799)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Artificial drainage channel
- **Gradient:** Moderate
- **Valley form:** Asymmetrical
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Rounded pebbles, Coarse gravel, Soil, Peat
- **Riparian corridor:** Moorland
- **Flow condition:** Dry

- **Water width (m):** 0.46
- **Water depth (m):** 0.72
- **Bankfull width (m):** -
- **Bankfull height (m):** -
- **Banktop height (m):** -
- **Flooded Bankfull width (m):** -
- **Flooded Bankfull height:** -

Present on 1:50,000 scale OS map? No
Note: No flow identified; indicative of an artificially drained channel.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

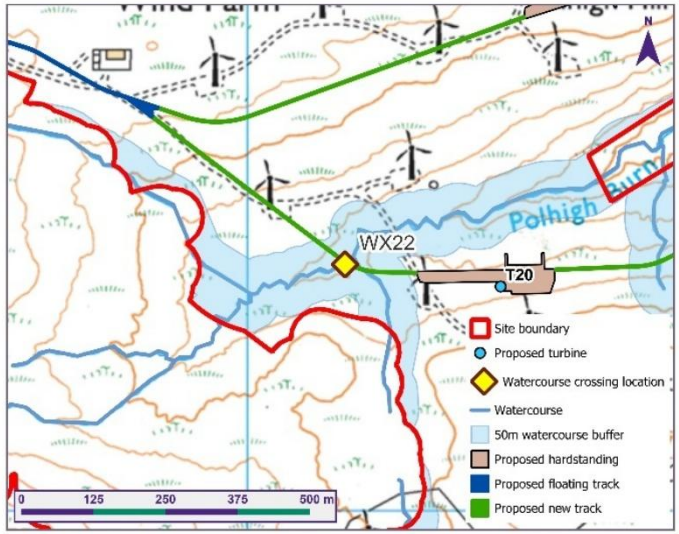
Upstream

Across

Downstream

Table 4.22 WX22 Detailed Assessment

WX22 (266170, 608427)	
Crossing Location	Crossing Description



- **Existing Crossing:** No
- **Channel Type:** Incised, Meandering
- **Gradient:** Gentle
- **Valley form:** Asymmetrical
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Rounded pebbles, Coarse gravel
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.69
- **Water depth (m):** 0.19
- **Bankfull width (m):** 0.77
- **Bankfull height (m):** 0.22
- **Banktop height (m):** 0.22
- **Flooded Bankfull width (m):** 0.83
- **Flooded Bankfull height:** 0.26

Present on 1:50,000 scale OS map? No
Note: Faster flow upstream as the channel narrows.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed

Crossing Photographs

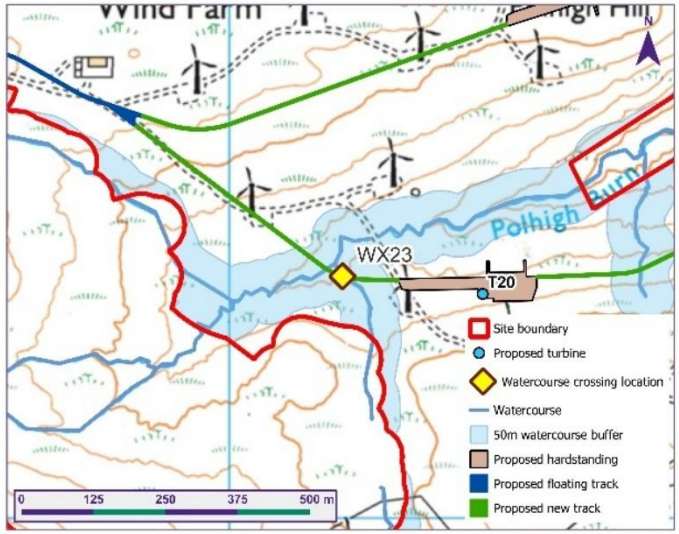
Upstream

Across

Downstream

Table 4.23 WX23 Detailed Assessment

WX23 (266197, 608419)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Poorly defined
- **Gradient:** Gentle
- **Valley form:** No obvious valley sides
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Rounded pebbles, Vegetation, Peat
- **Riparian corridor:** Moorland
- **Flow condition:** Slow

- **Water width (m):** 0.12
- **Water depth (m):** 0.09
- **Bankfull width (m):** 0.18
- **Bankfull height (m):** 0.13
- **Banktop height (m):** 0.13
- **Flooded Bankfull width (m):** 0.26
- **Flooded Bankfull height:** 0.18

Present on 1:50,000 scale OS map? No
Note: Channel is flowing through vegetation.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

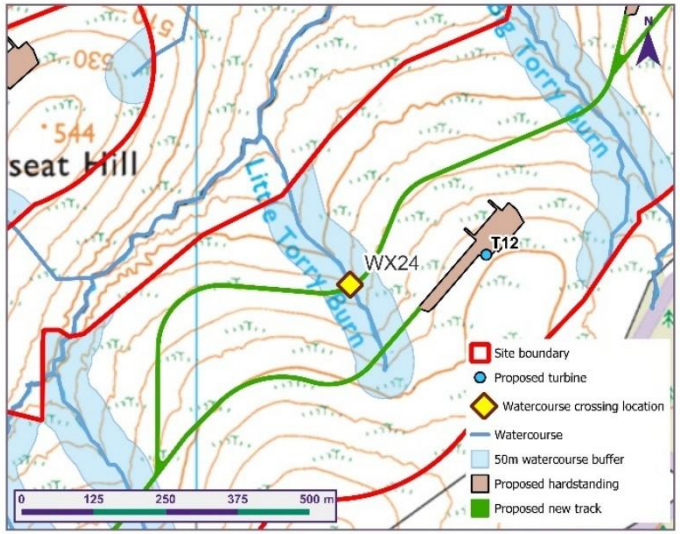
Upstream

Across

Downstream

Table 4.24 WX24 Detailed Assessment

WX24 (266267, 6054877)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Deep vee
- **Bank condition:** Stable
- **Bed material:** Vegetation, Coarse gravel
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.20
- **Water depth (m):** 0.15
- **Bankfull width (m):** 0.30
- **Bankfull height (m):** 0.25
- **Banktop height (m):** 3.00
- **Flooded Bankfull width (m):** 1.00
- **Flooded Bankfull height:** 0.50

Present on 1:50,000 scale OS map? Yes
Note: Substantial channel to cross with track.
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed

Crossing Photographs

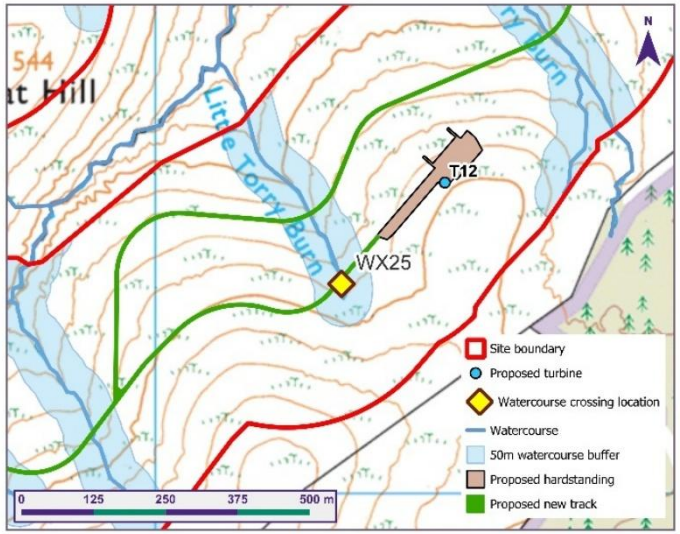
Upstream

Across

Downstream

Table 4.25 WX25 Detailed Assessment

WX25 (266324, 605363)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** None evident
- **Gradient:** Gentle
- **Valley form:** No obvious valley sides
- **Bank condition:**
- **Bed material:**
- **Riparian corridor:** Moorland
- **Flow condition:** Dry

- **Water width (m):** 0
- **Water depth (m):** 0
- **Bankfull width (m):** 0
- **Bankfull height (m):** 0
- **Banktop height (m):** 0
- **Flooded Bankfull width (m):** 0
- **Flooded Bankfull height:** 0

Present on 1:50,000 scale OS map? No – above mapped watercourse.
Note: Not a watercourse. Just above headwaters.
EASR Auth Level: N/A
Proposed Crossing Type: N/A

Crossing Photographs

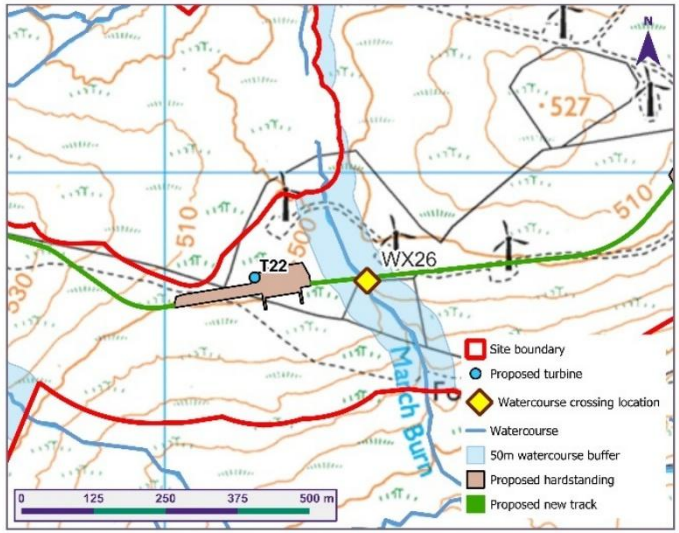
Upstream

Across

Downstream

Table 4.26 WX26 Detailed Assessment

WX26 (266352, 607812)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Gentle
- **Valley form:** Shallow vee
- **Bank condition:** Stable
- **Bed material:** Coarse gravel, Vegetation, Boulders
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.25
- **Water depth (m):** 0.10
- **Bankfull width (m):** 0.40
- **Bankfull height (m):** 0.20
- **Banktop height (m):** 2.00
- **Flooded Bankfull width (m):** 1-1.25
- **Flooded Bankfull height:** 0.50

Present on 1:50,000 scale OS map? Yes
Note: Deep cut of approx. 2m
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

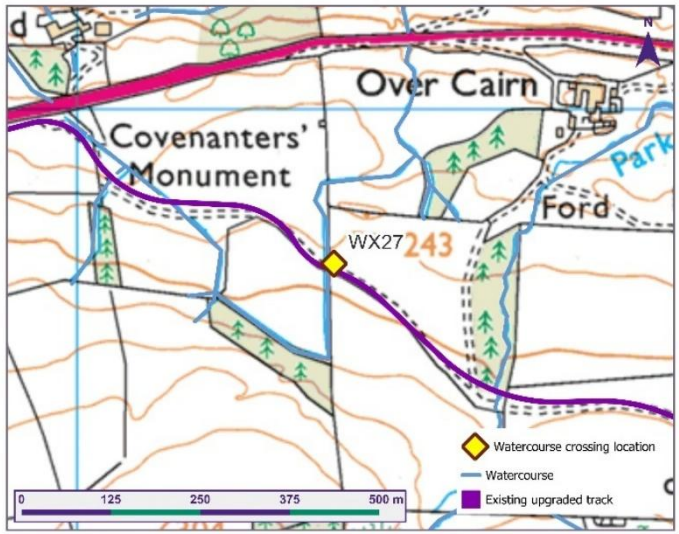
Upstream

Across

Downstream

Table 4.27 WX27 Detailed Assessment

WX27 (266360, 612784)	
Crossing Location	Crossing Description



- **Existing Crossing:** Yes
- **Crossing Type (existing)**: Circular Culvert
- **Crossing Material (existing)**: Plastic
- **Crossing Condition (existing)**: Average
- **Channel Type:** Poorly defined
- **Gradient:** Moderate
- **Valley form:** Shallow vee
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Vegetation
- **Riparian corridor:** Heavily Vegetated (e.g. gorse, bramble), Agricultural Grazing, Moorland
- **Flow condition:** Moderate
- **Culvert Dimensions (m)**: 0.34
- **Water width (m):** 0.12
- **Water depth (m):** 0.05
- **Bankfull width (m):** 0.38
- **Bankfull height (m):** 0.09
- **Banktop height (m):** 0.09
- **Flooded Bankfull width (m):** 0.79
- **Flooded Bankfull height:** 0.18

Present on 1:50,000 scale OS map? No
Note: Heavily vegetated channel.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, an upgraded circular culvert is recommended.

Crossing Photographs

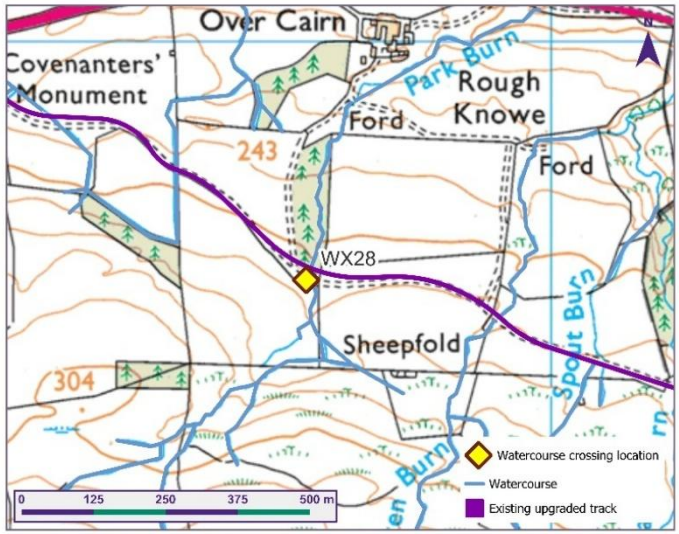
Upstream

Across

Downstream

Table 4.28 WX28 Detailed Assessment

WX28 (266576, 612586)	
Crossing Location	Crossing Description



- **Existing Crossing:** Yes
- **Crossing Type (existing)**: Circular Culvert
- **Crossing Material (existing)**: Plastic
- **Crossing Condition (existing)**: Good
- **Channel Type:** Incised, Meandering
- **Gradient:** Moderate
- **Valley form:** Shallow vee
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Boulders, Coarse gravel, Rounded pebbles
- **Riparian corridor:** Moorland, Agricultural Grazing
- **Flow condition:** Moderate
- **Culvert Dimensions (m)**: 1.04
- **Water width (m):** 1.19
- **Water depth (m):** 0.21
- **Bankfull width (m):** 1.35
- **Bankfull height (m):** 0.29
- **Banktop height (m):** 0.29
- **Flooded Bankfull width (m):** 1.46
- **Flooded Bankfull height:** 0.37

Present on 1:50,000 scale OS map? Yes
Note: Large hydraulic drop upon exit of the culvert.
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, aid fish passage and mitigate hydraulic drop an upgraded oversized bottomless arch culvert which contains natural bed material is recommended.

Crossing Photographs

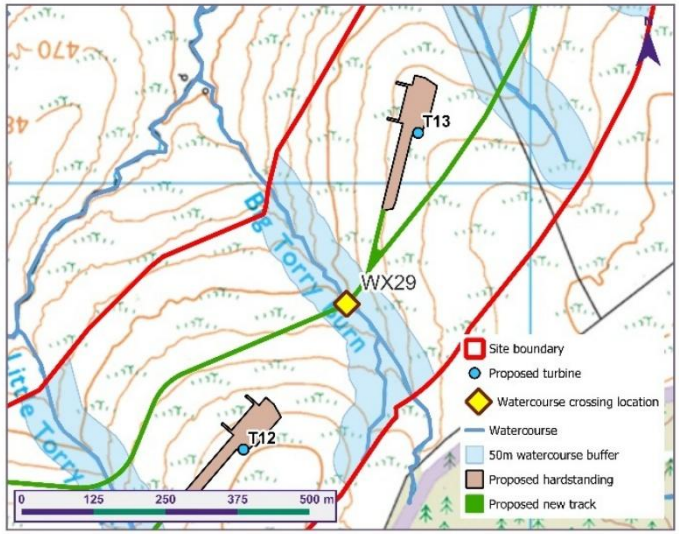
Upstream

Across

Downstream

Table 4.29 WX29 Detailed Assessment

Crossing Location	WX29 (266682, 605791) Crossing Description



- **Existing Crossing:** No
- **Crossing Type (existing)**:
- **Crossing Material (existing)**:
- **Crossing Condition (existing)**:
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Deep vee, Gorge
- **Bank condition:** Stable
- **Bed material:** Fine sand/silt, Rounded pebbles, Coarse gravel, Boulders
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate
-

- **Water width (m):** 0.80
- **Water depth (m):** 0.25
- **Bankfull width (m):** 1.20
- **Bankfull height (m):** 0.40
- **Banktop height (m):** 5.00
- **Flooded Bankfull width (m):** 1.50-2.00
- **Flooded Bankfull height:** 0.80

Present on 1:50,000 scale OS map? Yes
Note: Deep channel to cross, will probably need a bridge or relocate track at least 150m upstream.
EASR Auth Level: Registration
Proposed Crossing Type: The stream is located within a deeply incised gorge valley, where a conventional bridge could provide the most effective watercourse crossing.

Crossing Photographs

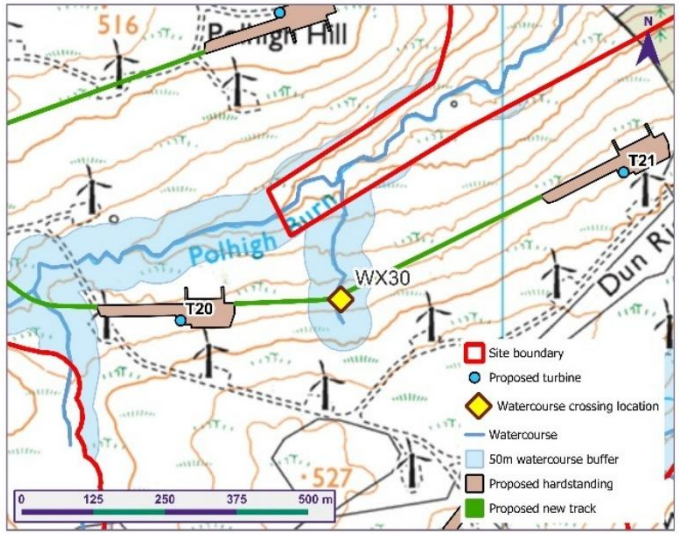
Upstream

Across

Downstream

Table 4.30 WX30 Detailed Assessment

WX30 (266719, 608425)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Poorly defined
- **Gradient:** Moderate
- **Valley form:** No obvious valley sides, Shallow vee
- **Bank condition:** Stable
- **Bed material:** Vegetation, Coarse gravel
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.15
- **Water depth (m):** 0.05
- **Bankfull width (m):** 0.25
- **Bankfull height (m):** 0.15
- **Banktop height (m):** -
- **Flooded Bankfull width (m):** 0.30-0.80
- **Flooded Bankfull height:** 0.30

Present on 1:50,000 scale OS map? No
Note: Watercourse contained obscured by vegetation but can hear it.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is recommended.

Crossing Photographs

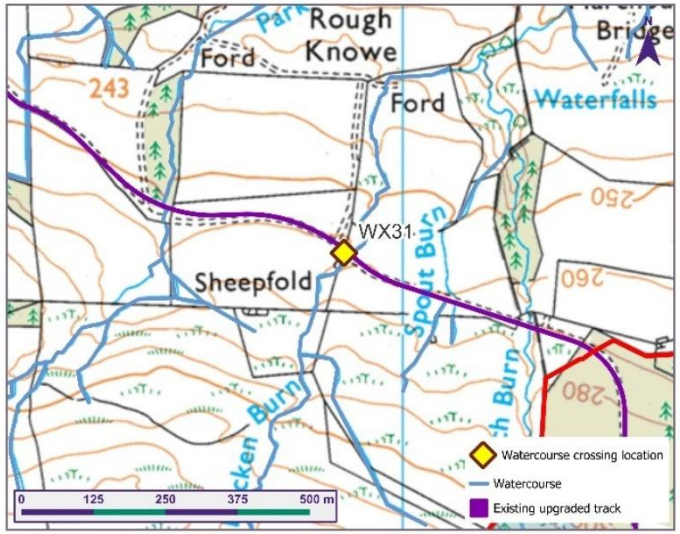
Upstream

Across

Downstream

Table 4.31 WX31 Detailed Assessment

WX31 (266899, 612525)	
Crossing Location	Crossing Description



- **Existing Crossing:** Yes
- **Crossing Type (existing)**: Circular Culvert
- **Crossing Material (existing)**: Plastic
- **Crossing Condition (existing)**: Good
- **Channel Type:** Meandering
- **Gradient:** Gentle
- **Valley form:** Shallow vee
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Boulders, Coarse gravel, Rounded pebbles
- **Riparian corridor:** Agricultural Grazing, Moorland
- **Flow condition:** Moderate
- **Culvert Dimensions (m)**: 1.48
- **Water width (m):** 0.85
- **Water depth (m):** 0.14
- **Bankfull width (m):** 1.24
- **Bankfull height (m):** 0.23
- **Banktop height (m):** 0.23
- **Flooded Bankfull width (m):** 1.31
- **Flooded Bankfull height:** 0.29

Present on 1:50,000 scale OS map? Yes
Note: Large pool at exit of culvert and slight drop on exit.
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, aid fish passage and mitigate hydraulic drop, an upgraded oversized bottomless arch culvert which contains natural bed material is recommended.

Crossing Photographs

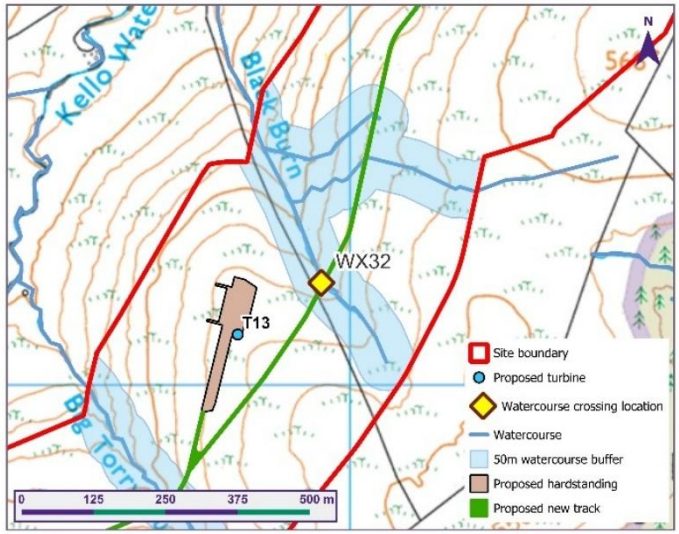
Upstream

Across

Downstream

Table 4.32 WX32 Detailed Assessment

WX32 (266951, 606177)	
Crossing Location	Crossing Description



- **Existing Crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Shallow vee, Deep vee
- **Bank condition:** Stable
- **Bed material:** Boulders, Coarse gravel, Peat, Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.20
- **Water depth (m):** 0.10
- **Bankfull width (m):** 0.50
- **Bankfull height (m):** 0.50
- **Banktop height (m):** 2.00
- **Flooded Bankfull width (m):** 1.00-1.50
- **Flooded Bankfull height:** 0.70

Present on 1:50,000 scale OS map? Yes
Note: Water channel mostly obscured by vegetation.
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

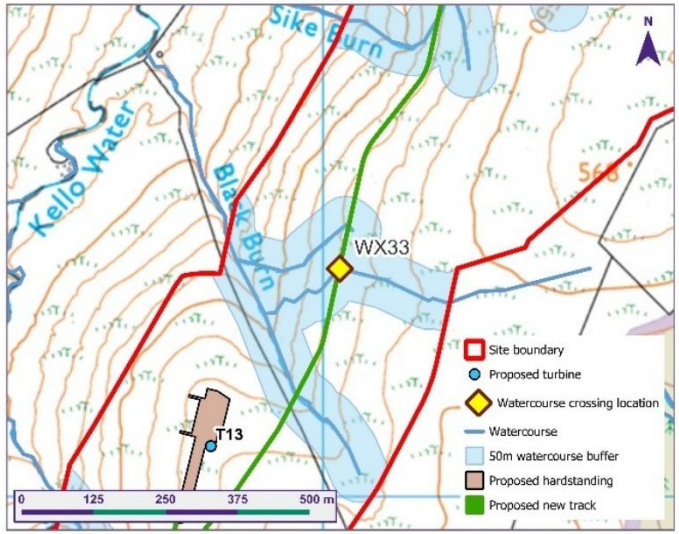
Upstream

Across

Downstream

Table 4.33 WX33 Detailed Assessment

WX33 (267030, 606395)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Shallow vee, Deep vee
- **Bank condition:** Stable
- **Bed material:** Coarse gravel, Boulders, Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Slow

- **Water width (m):** 0.20
- **Water depth (m):** 0.05
- **Bankfull width (m):** 0.35
- **Bankfull height (m):** 0.20
- **Banktop height (m):** 2.00
- **Flooded Bankfull width (m):** 0.80
- **Flooded Bankfull height:** 0.50

Present on 1:50,000 scale OS map? No
Note: Small incised channel, 2m deep.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

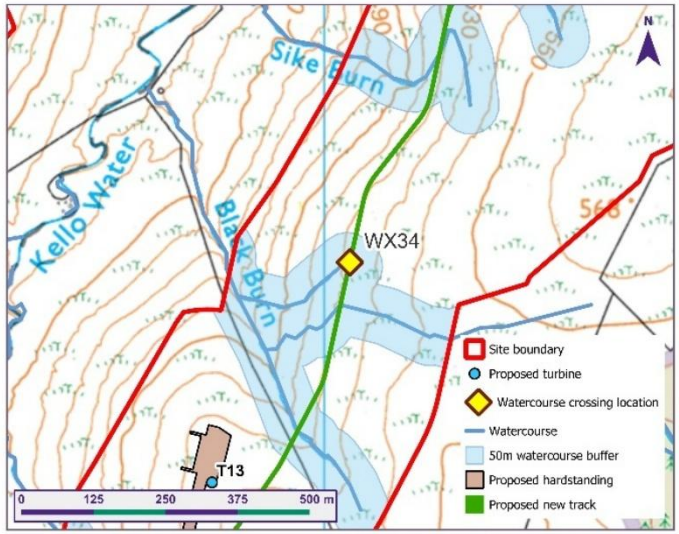
Upstream

Across

Downstream

Table 4.34 WX34 Detailed Assessment

WX34 (267045, 606469)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Poorly defined
- **Gradient:** Moderate
- **Valley form:** Shallow vee, No obvious valley sides
- **Bank condition:** Stable
- **Bed material:** Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Stagnant

- **Water width (m):** 0.10
- **Water depth (m):** 0.05
- **Bankfull width (m):** 0.20
- **Bankfull height (m):** 0.10
- **Banktop height (m):** -
- **Flooded Bankfull width (m):** 1.00
- **Flooded Bankfull height:** 0.30

Present on 1:50,000 scale OS map? No
Note: Wet flush, with stagnant water, but could flow in wet conditions.
EASR Auth Level: GBR
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

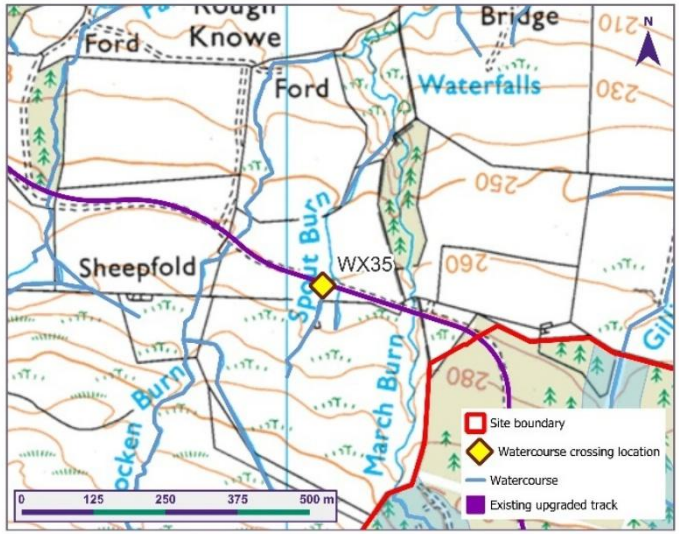
Upstream

Across

Downstream

Table 4.35 WX35 Detailed Assessment

WX35 (267063, 612443)	
Crossing Location	**Crossing Description**



- **Existing crossing:** Yes
- **Crossing Type (existing)**: Circular Culvert
- **Crossing Material (existing)**: Plastic
- **Crossing Condition (existing)**: Good
- **Channel Type:** Incised, Poorly defined
- **Gradient:** Gentle
- **Valley form:** Gorge
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Rounded pebbles, Coarse gravel
- **Riparian corridor:** Moorland, Agricultural Grazing
- **Flow condition:** Moderate
- **Water width (m):** 0.34
- **Water depth (m):** 0.17
- **Bankfull width (m):** 0.67
- **Bankfull height (m):** 0.57
- **Banktop height (m):** 0.57
- **Flooded Bankfull width (m):** 0.86
- **Flooded Bankfull height:** 0.65

Present on 1:50,000 scale OS map? Yes
Note: Build-up of material at the entrance of existing culvert as well as hydraulic drop at the exit of culvert
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow and mitigate hydraulic drop, an upgraded oversized bottomless arch culvert which contains natural bed material is recommended.

Crossing Photographs

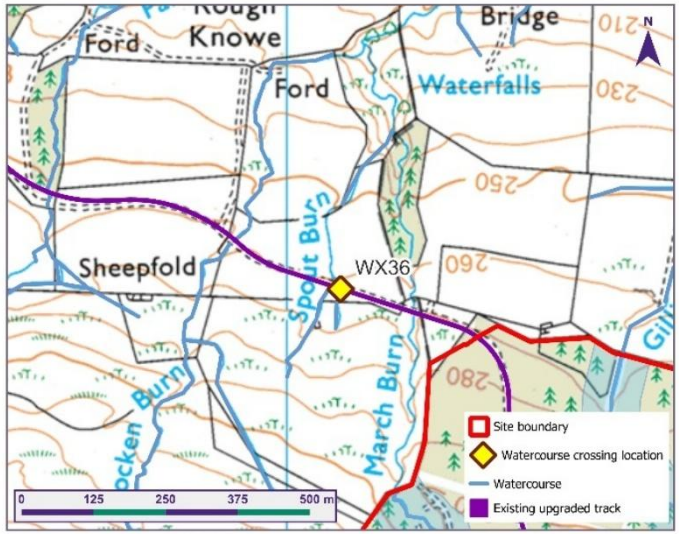
Upstream

Across

Downstream

Table 4.36 WX36 Detailed Assessment

WX36 (267094, 612437)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** None evident
- **Gradient:** Gentle
- **Valley form:** Gorge
- **Bank condition:** None evident
- **Bed material:** None evident
- **Riparian corridor:** Moorland, Agricultural Grazing
- **Flow condition:** Stagnant pool

- **Water width (m):** N/A
- **Water depth (m):** N/A
- **Bankfull width (m):** N/A
- **Bankfull height (m):** N/A
- **Banktop height (m):** N/A
- **Flooded Bankfull width (m):** N/A
- **Flooded Bankfull height:** N/A

Present on 1:50,000 scale OS map? No
Note: Stagnant pool present no evidence of a watercourse.
EASR Auth Level: N/A
Proposed Crossing Type: N/A

Crossing Photographs

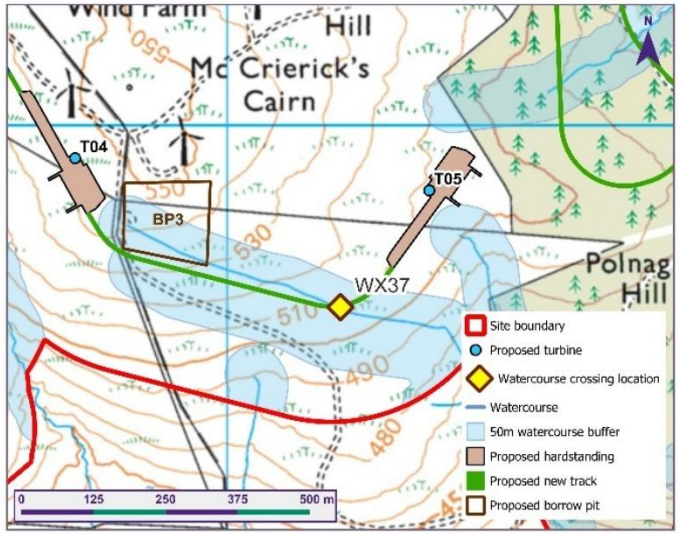
Upstream

Across

Downstream

Table 4.37 WX37 Detailed Assessment

WX37 (267197, 609685)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** None evident
- **Gradient:** Gentle
- **Valley form:** No obvious valley sides
- **Bank condition:** None evident
- **Bed material:** Vegetation
- **Riparian corridor:** Moorland, Agricultural Grazing
- **Flow condition:** N/A

- **Water width (m):** N/A
- **Water depth (m):** N/A
- **Bankfull width (m):** N/A
- **Bankfull height (m):** N/A
- **Banktop height (m):** N/A
- **Flooded Bankfull width (m):** N/A
- **Flooded Bankfull height:** N/A

Present on 1:50,000 scale OS map? No
Note: No flow evident. Fully vegetated. Indicative of an artificial ditch with no flow.
EASR Auth Level: N/A
Proposed Crossing Type: N/A

Crossing Photographs

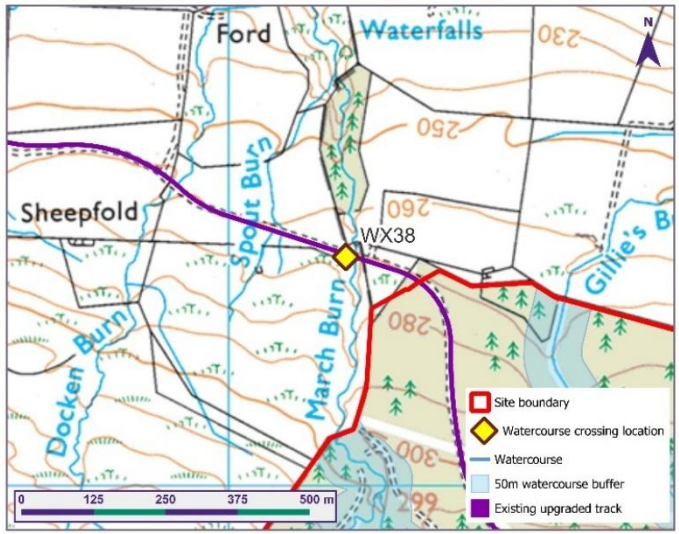
Upstream

Across

Downstream

Table 4.38 WX38 Detailed Assessment

WX38 (267204, 612397)	
Crossing Location	Crossing Description



- **Existing Crossing:** Yes
- **Crossing Type (existing):** Circular Culvert
- **Crossing Material (existing):** Plastic
- **Crossing Condition (existing):** Good
- **Channel Type:** Incised, Meandering
- **Gradient:** Gentle
- **Valley form:** Shallow vee
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Rounded pebbles, Bedrock
- **Riparian corridor:** Moorland, Agricultural Grazing
- **Flow condition:** Moderate

- **Culvert Dimensions (m):** 1.38
- **Water width (m):** 0.96
- **Water depth (m):** 0.16
- **Bankfull width (m):** 1.49
- **Bankfull height (m):** 0.22
- **Banktop height (m):** 0.22
- **Flooded Bankfull width (m):** 1.31
- **Flooded Bankfull height:** 0.27

Present on 1:50,000 scale OS map? Yes
Note: Slight drop down within the culvert with hydraulic drop increasing erosion.
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, aid fish passage and mitigate hydraulic drop an upgraded oversized bottomless arch culvert which contains natural bed material is recommended.

Crossing Photographs

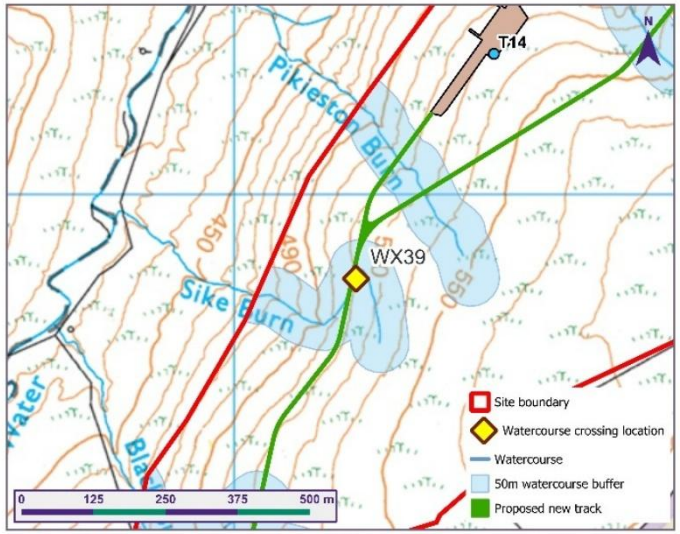
Upstream

Across

Downstream

Table 4.39 WX39 Detailed Assessment

WX39 (267212, 606854)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** N/A
- **Gradient:** N/A
- **Valley form:** N/A
- **Bank condition:** N/A
- **Bed material:** N/A
- **Riparian corridor:** N/A
- **Flow condition:** N/A

- **Water width (m):** N/A
- **Water depth (m):** N/A
- **Bankfull width (m):** N/A
- **Bankfull height (m):** N/A
- **Banktop height (m):** N/A
- **Flooded Bankfull width (m):** N/A
- **Flooded Bankfull height:** N/A

Present on 1:50,000 scale OS map? Yes
Note: No watercourse evident during site visit.
EASR Auth Level: N/A
Proposed Crossing Type: N/A

Crossing Photographs

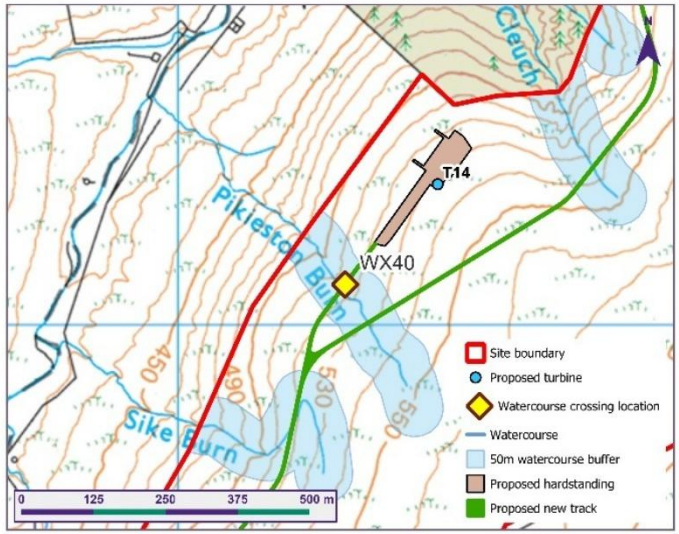
Upstream

Across

Downstream

Table 4.40 WX40 Detailed Assessment

WX40 (267291, 607070)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Deep vee, Shallow vee
- **Bank condition:** Unstable (potential recent collapse)
- **Bed material:** Rounded pebbles, Coarse gravel, Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.20
- **Water depth (m):** 0.15
- **Bankfull width (m):** 0.40
- **Bankfull height (m):** 0.25
- **Banktop height (m):** 3.00
- **Flooded Bankfull width (m):** 0.60-1.00
- **Flooded Bankfull height:** 0.45

Present on 1:50,000 scale OS map? Yes
Note: Fairly deep channel, consider moving track up or downstream.
EASR Auth Level: Registration
Proposed Crossing Type: Relatively deep channel which is located within a deep valley, therefore a small conventional bridge could provide the most effective watercourse crossing.

Crossing Photographs

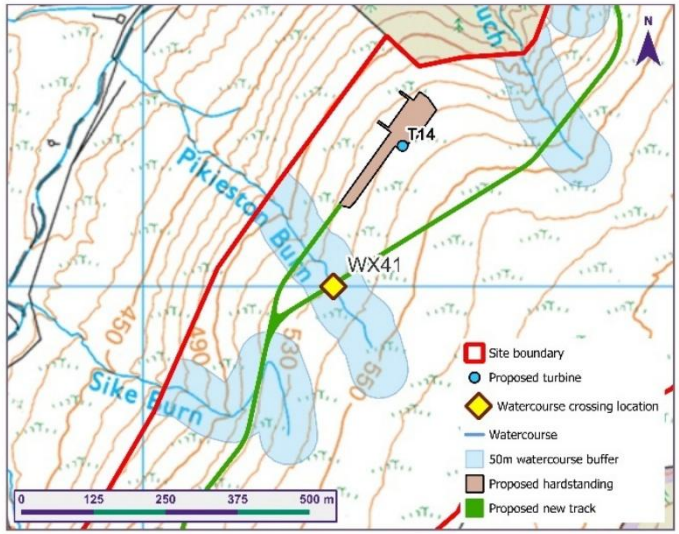
Upstream

Across

Downstream

Table 4.41 WX41 Detailed Assessment

WX41 (267331, 607000)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Shallow vee
- **Bank condition:** Stable
- **Bed material:** Coarse gravel, Boulders, Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Moderate

- **Water width (m):** 0.16
- **Water depth (m):** 0.08
- **Bankfull width (m):** 0.25
- **Bankfull height (m):** 0.40
- **Banktop height (m):** 2.00
- **Flooded Bankfull width (m):** 0.70-1.00
- **Flooded Bankfull height:** 0.60

Present on 1:50,000 scale OS map? Yes
Note: None
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

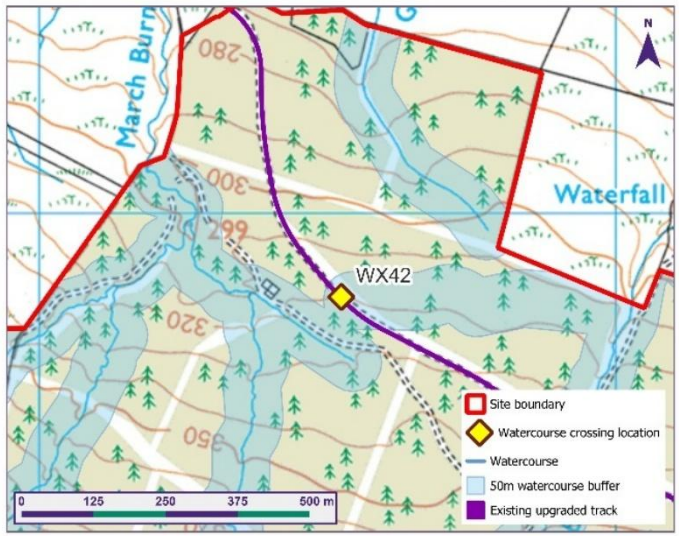
Upstream

Across

Downstream

Table 4.42 WX42 Detailed Assessment

WX42 (267525, 611855)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** N/A
- **Gradient:** N/A
- **Valley form:** N/A
- **Bank condition:** N/A
- **Bed material:** N/A
- **Riparian corridor:** N/A
- **Flow condition:** N/A

- **Water width (m):** N/A
- **Water depth (m):** N/A
- **Bankfull width (m):** N/A
- **Bankfull height (m):** N/A
- **Banktop height (m):** N/A
- **Flooded Bankfull width (m):** N/A
- **Flooded Bankfull height:** N/A

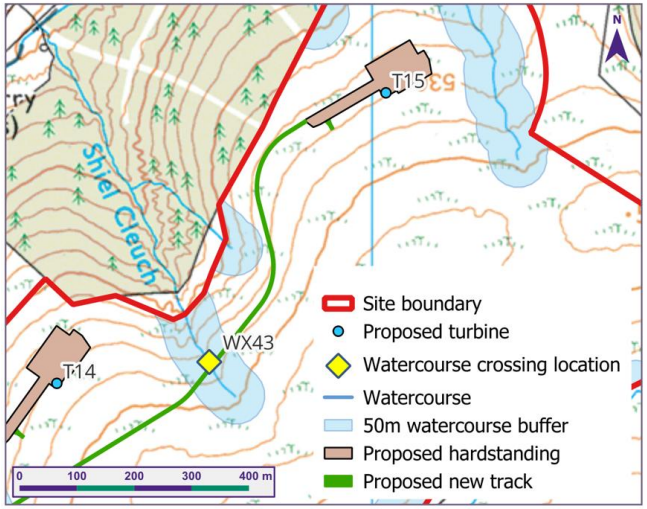
Present on 1:50,000 scale OS map? No
Note: No watercourse identified.
EASR Auth Level: N/A
Proposed Crossing Type: N/A

Crossing Photographs

Upstream	Across	Downstream
		

Table 4.43 WX43 Detailed Assessment

WX43 (267717, 607281)	
Crossing Location	Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Deep vee, Shallow vee
- **Bank condition:** Stable
- **Bed material:** Rounded pebbles, Coarse gravel, Vegetation
- **Riparian corridor:** Moorland
- **Flow condition:** Slow

- **Water width (m):** 0.10
- **Water depth (m):** 0.05
- **Bankfull width (m):** 0.20
- **Bankfull height (m):** 0.20
- **Banktop height (m):** 1.50
- **Flooded Bankfull width (m):** 0.50-1.00
- **Flooded Bankfull height:** 0.60-1.00

Present on 1:50,000 scale OS map? Yes
Note: Watercourse mostly obscured by vegetation but could have increased flow in wet conditions.
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs

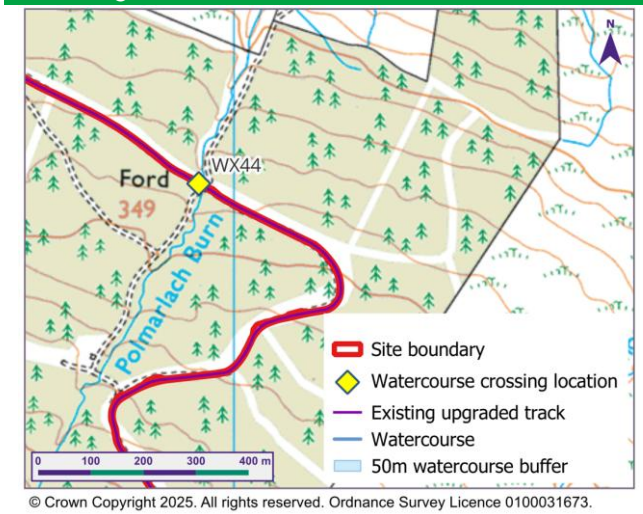
Upstream

Across

Downstream

Table 4.44 WX44 Detailed Assessment

WX44 (267934, 611594)	
Crossing Location	Crossing Description



- **Existing Crossing:** Yes
- **Crossing Type (existing):** Circular Culvert
- **Crossing Material (existing):** Concrete
- **Crossing Condition (existing):** Good
- **Channel Type:** Incised, Meandering
- **Gradient:** Moderate
- **Valley form:** Gorge
- **Bank condition:** Undercut (no evidence of recent collapse)
- **Bed material:** Boulders, Rounded pebbles, Coarse gravel
- **Riparian corridor:** Commercial Forestry, Heavily Vegetated (e.g. gorse, bramble)
- **Flow condition:** Moderate
- **Culvert Dimensions (m):** 1.00
- **Water width (m):** 1.47
- **Water depth (m):** 0.15
- **Bankfull width (m):** 1.52
- **Bankfull height (m):** 0.25
- **Banktop height (m):** 0.25
- **Flooded Bankfull width (m):** 1.68
- **Flooded Bankfull height:** 0.38

Present on 1:50,000 scale OS map? Yes
Note: Culvert is made of concrete and plastic (inner section seems to be plastic) Drop at the exit of the culvert generating fast flow.
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, aid fish passage and mitigate hydraulic drop an upgraded oversized bottomless arch culvert which contains natural bed material is recommended.

Crossing Photographs

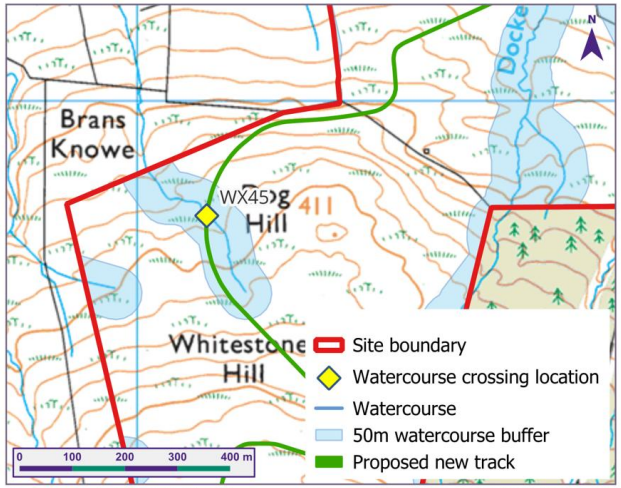
Upstream

Across

Downstream

Table 4.45 WX45 Detailed Assessment

Crossing Location	WX45 (266133, 611782) Crossing Description



- **Existing crossing:** No
- **Channel Type:** Incised
- **Gradient:** Moderate
- **Valley form:** Shallow vee
- **Bank condition:** Stable
- **Bed material:**
- **Riparian corridor:** Moorland
- **Flow condition:**
- **Water width (m):** 0.5
- **Water depth (m):** -
- **Bankfull width (m):** 1.2
- **Bankfull height (m):** -
- **Banktop height (m):** -
- **Flooded Bankfull width (m):** 1.3
- **Flooded Bankfull height:** -

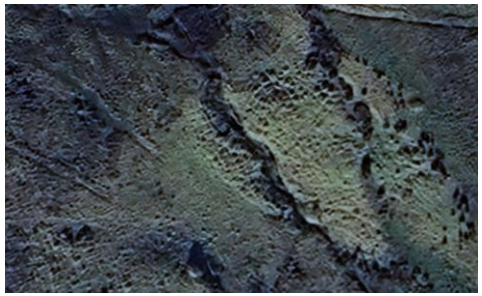
Present on 1:50,000 scale OS map? Yes
Note: Assessed using satellite imagery.
EASR Auth Level: Registration
Proposed Crossing Type: To accommodate flow, a circular culvert is proposed.

Crossing Photographs – Google Earth Satellite Imagery (2025)

2016

2018

2024



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