



Technical Appendix 8.1: Schedule of Watercourse Crossings

Hagshaw Energy Cluster Western Expansion

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Basis of Report

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1.0 Introduction

SLR Consulting Ltd (SLR) was commissioned by 3R Energy Solutions Ltd to undertake a schedule of proposed new and existing watercourse crossings which will be upgraded as part of Hagshaw Energy Cluster – Western Expansion | Phase 1 (the Proposed Development).

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

A survey of the proposed watercourse crossings was undertaken in November 2024 by experienced SLR hydrologists. The site design has been reiterated since the initial watercourse crossing surveys were undertaken, and therefore there are three watercourse crossings that were surveyed by the Applicant team and information passed to SLR. Project engineers also surveyed a number of the watercourse crossing points, these are highlighted within the table at Section 2.0 below..

The location of the watercourse crossings is shown in **Figure 8.8 (a to c)**.

1.1 Relevant Legislation

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

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

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




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




2.0 Watercourse Crossing Details



The locations of new and existing watercourse crossings which may be upgraded as part of the Proposed Development are shown on **Figure 8.8a-c**. Twelve new watercourse crossings and four existing crossings on tracks which will be upgraded are required to facilitate the Proposed Development, details of which are included below.

Watercourse Crossing ID	WX01
Watercourse Crossing Details	<p>Grid Reference: E 266604/ N 635522</p> <p>Status: New</p> <p>Watercourse Width: 1.0 m</p> <p>Watercourse Depth: 0.1 m</p> <p>Notes: Watercourse was not monitored during hydrology survey however approx. measurements and photographs provided from Applicant walkover.</p>
Photograph Looking Upstream	





Watercourse Crossing ID	WX01
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Culvert Registration





Watercourse Crossing ID	WX02
Watercourse Crossing Details	<p>Grid Reference: E 266135 / N 635803</p> <p>Status: New</p> <p>Watercourse Width: 1.0 m</p> <p>Watercourse Depth: 0.1 m</p> <p>Notes: Proposed crossing location is noted approximately 100 m upstream of WX01. Watercourse was not monitored during hydrology survey however approx. measurements and photographs provided from Applicant walkover.</p>
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Culvert Registration





Watercourse Crossing ID	WX03
Watercourse Crossing Details	Grid Reference: E 266604 / N 635522 Status: New Watercourse Width: 0.5 m Watercourse Depth: 0.1 m Notes: None.
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Culvert Registration





Watercourse Crossing ID	WX04
Watercourse Crossing Details	Grid Reference: E 267571 / N 634302 Status: New Watercourse Width: 1 to 1.5 m Watercourse Depth: 0.4 m Notes: Watercourse located in a slightly deeper channel which is up to 1.2 m deep.
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Culvert Registration





Watercourse Crossing ID	WX05
Watercourse Crossing Details	<p>Grid Reference: E 267879 / N 634703</p> <p>Status: Existing to be upgraded</p> <p>Crossing Type: Steel circular culvert</p> <p>Crossing Size: 1.5 m diameter</p> <p>Watercourse Width: 0.4 to 1 m</p> <p>Watercourse Depth: 0.1 m</p> <p>Notes: Watercourse width noted to pool up to 1 m wide.</p>
Photograph of Culvert Entrance Looking from Upstream	 <p>A photograph showing the entrance of a culvert from an upstream perspective. The culvert is a dark, circular opening in a grassy area, surrounded by dense vegetation and trees. The water level is visible just inside the entrance.</p>
Photograph of Culvert Exit Looking from Downstream	 <p>A photograph showing the exit of a culvert from a downstream perspective. The culvert is a dark, circular opening in a grassy area, surrounded by dense vegetation and trees. The water level is visible just inside the exit.</p>





Watercourse Crossing ID	WX06
Watercourse Crossing Details	Grid Reference: E 268061 / N 633972 Status: Existing Notes: Watercourse was not monitored during hydrology survey however photographs provided from Applicant walkover.
Photograph Looking Upstream	
Photograph Looking Downstream	





Watercourse Crossing ID	WX07
Watercourse Crossing Details	<p>Grid Reference: E 268241 / N 633989</p> <p>Status: New</p> <p>Watercourse Width: 3.0 m</p> <p>Watercourse Depth: 0.2 m</p> <p>Notes: At crossing location watercourse is approximately 10 m wide and with a mapped floodplain which is up to approximately 50 m wide on the SEPA flood maps. Additional measurements and photographs provided by Applicant as not monitored during hydrology survey, although as noted in Section 1.0 the project engineers have visited the crossing location.</p>
Photograph Looking Upstream	 <p>A photograph showing a narrow watercourse flowing through a wooded area. The water is dark and reflects the surrounding trees. The banks are covered with dry, brown vegetation and some green moss. The trees are mostly bare, suggesting a late autumn or winter setting.</p>
Photograph Looking Downstream	 <p>A photograph showing a watercourse flowing through a wooded area. The water is dark and reflects the surrounding trees. The banks are covered with dry, brown vegetation and some green moss. The trees are mostly bare, suggesting a late autumn or winter setting.</p>
Potential Crossing Type Likely Required CAR Authorisation	Oversized bottomless arch culvert Registration





Watercourse Crossing ID	WX08
Watercourse Crossing Details	Grid Reference: E 270739 / N 634545 Status: New Watercourse Width: n/a Watercourse Depth: n/a Notes: No visible channel at crossing point during survey.
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Culvert Registration





Watercourse Crossing ID	WX09
Watercourse Crossing Details	Grid Reference: E 270842 / N 634896 Status: New Watercourse Width: 0.3 m Watercourse Depth: 0.1 m Notes: None.
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Culvert Registration





Watercourse Crossing ID	WX10
Watercourse Crossing Details	Grid Reference: E 269595 / N 629608 Status: New Watercourse Width: 0.3 m Watercourse Depth: 0.1 m Notes: None.
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Culvert Registration





Watercourse Crossing ID	WX11
Watercourse Crossing Details	Grid Reference: E 269143 / N 629588 Status: New Watercourse Width: 0.4 – 1 m Watercourse Depth: 0.3 m Notes: Watercourse inaccessible at the proposed crossing point. Watercourse is located within an incised channel which is approximately 10 to 15 m deep.
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Oversized bottomless arch culvert Registration





Watercourse Crossing ID	WX12
Watercourse Crossing Details	<p>Grid Reference: E 268478 / N 629342</p> <p>Status: Existing to be upgraded</p> <p>Crossing Type: Plastic circular culvert</p> <p>Crossing Size: 0.3 m diameter</p> <p>Watercourse Width: 0.5 m</p> <p>Watercourse Depth: 0.1 m</p> <p>Notes: Culvert entrance not found during survey. Ponding of water around channel indicated existing culvert potentially blocked.</p>
Photograph Looking Upstream	 <p>A photograph showing a watercourse with tall, dry grasses and reeds growing along the banks. The water is murky and brown, and the overall scene is somewhat overcast.</p>
Photograph Looking Downstream	 <p>A photograph showing a close-up view of a watercourse. The water is dark and murky, and there is a lot of debris, including sticks and leaves, floating in it. The banks are covered in tall, dry grasses.</p>




Watercourse Crossing ID	WX13
Watercourse Crossing Details	Grid Reference: E 268295 / N 629278 Status: New Watercourse Width: 0.5 to 1.5 m Watercourse Depth: 0.1 m Notes: Watercourse surveyed approximately 10 m downstream of proposed crossing point.
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Culvert Registration





Watercourse Crossing ID	WX14
Watercourse Crossing Details	Grid Reference: E 267995 / N 629069 Status: New Watercourse Width: n/a Watercourse Depth: n/a Notes: No obvious channel. Slight trickle of water under vegetation.
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Culvert Registration



Watercourse Crossing ID	WX15
Watercourse Crossing Details	Grid Reference: E 267702 / N 629066 Status: New Watercourse Width: 1.5 to 2.5 m Watercourse Depth: 0.3 m Notes: Watercourse noted dry during survey.
Photograph Looking Upstream	
Photograph Looking Downstream	
Potential Crossing Type Likely Required CAR Authorisation	Oversized bottomless arch culvert Registration

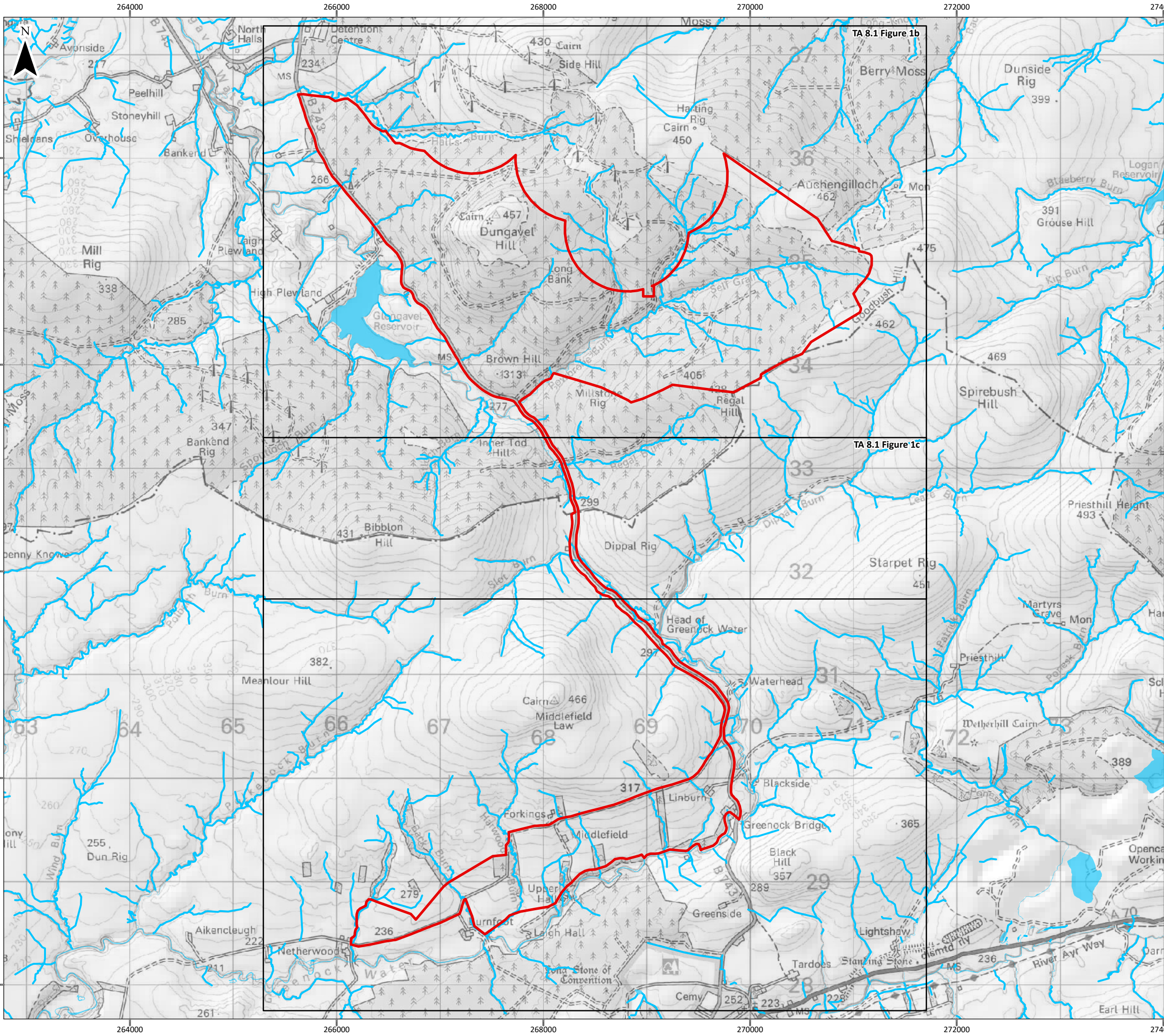


Watercourse Crossing ID	WX16
Watercourse Crossing Details	<p>Grid Reference: E 267230 / N 628846</p> <p>Status: Existing</p> <p>Crossing Type: Stone arch culvert</p> <p>Crossing Size: 2.1 m high and 1.8 m wide</p> <p>Watercourse Width: 2 m</p> <p>Watercourse Depth: 0.1 m</p> <p>Notes:</p>
Photograph of Culvert Entrance Looking from Upstream	
Photograph of Culvert Exit Looking from Downstream	





Making Sustainability Happen






Legend

- Site Boundary
- Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

0 0.5 1 1.5 2 Km

Scale 1:35,000 @ A3

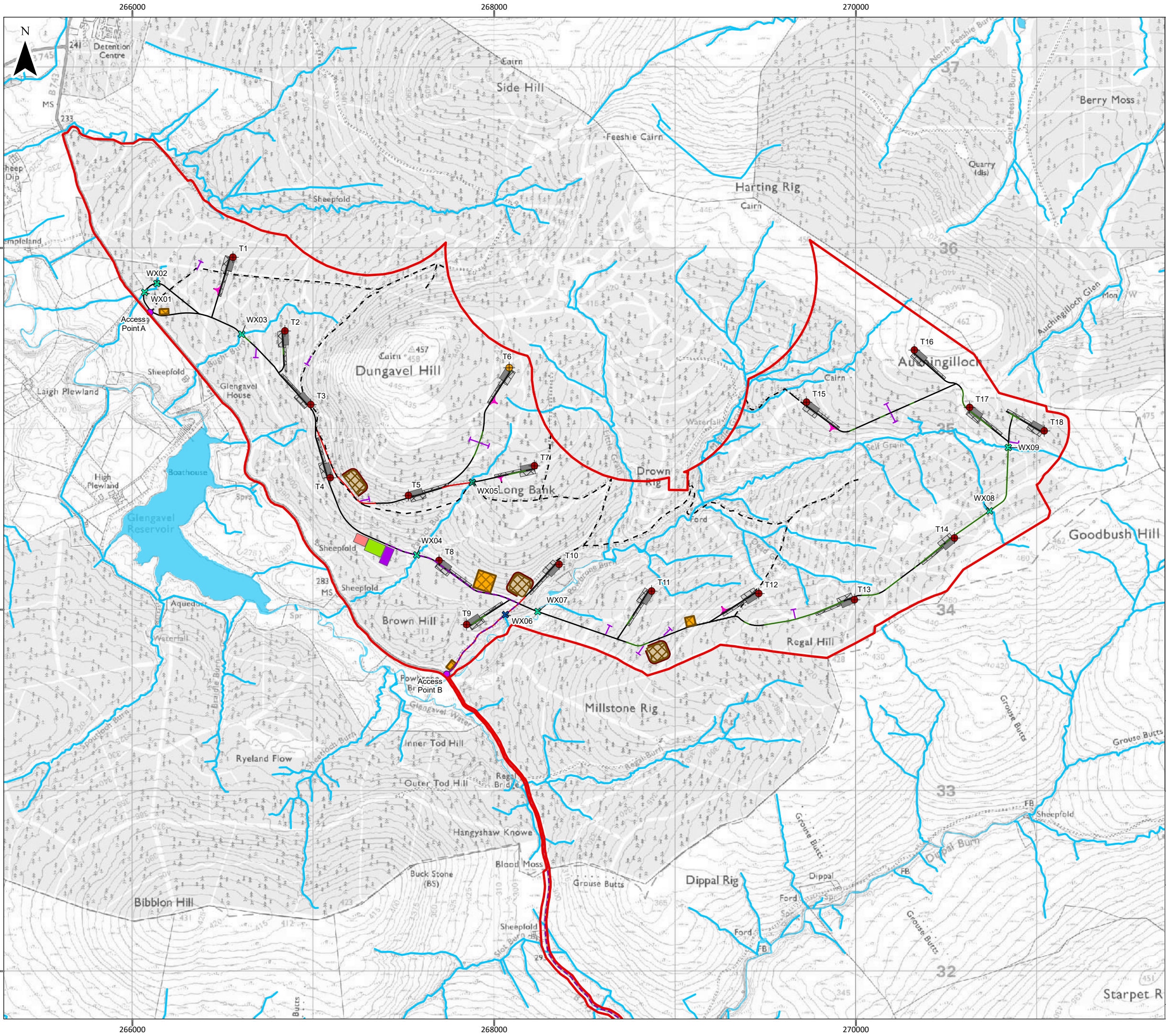
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Hagshaw Energy Cluster - Western Expansion
Phase 1
EIA Report

TA 8.1 Figure 1a
Watercourse Crossing Location

Date: 31/03/2025	Drawn by: DB	Checked by: JC	Version: V1
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Legend

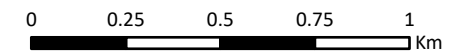
- Site Boundary
- Turbine Location (200m to tip)
- Turbine Location (230m to tip)
- Temporary Hardstand
- Permanent Hardstand
- Turning Heads
- Underground Electricity Export Cable(s)
- Proposed Development Substation
- SPEN Substation
- SPEN Temporary Compound & BESS
- Temporary Construction Compound
- Borrow Pit and Bund
- Borrow Pit Surface Water Drain
- Proposed Access Point

Access Tracks

- Existing - Upgraded
- Floating
- Cut
- Existing Forest Road
- Forestry Spur Road

Watercourse Crossing

- New
- Existing - Upgraded
- Existing
- Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)



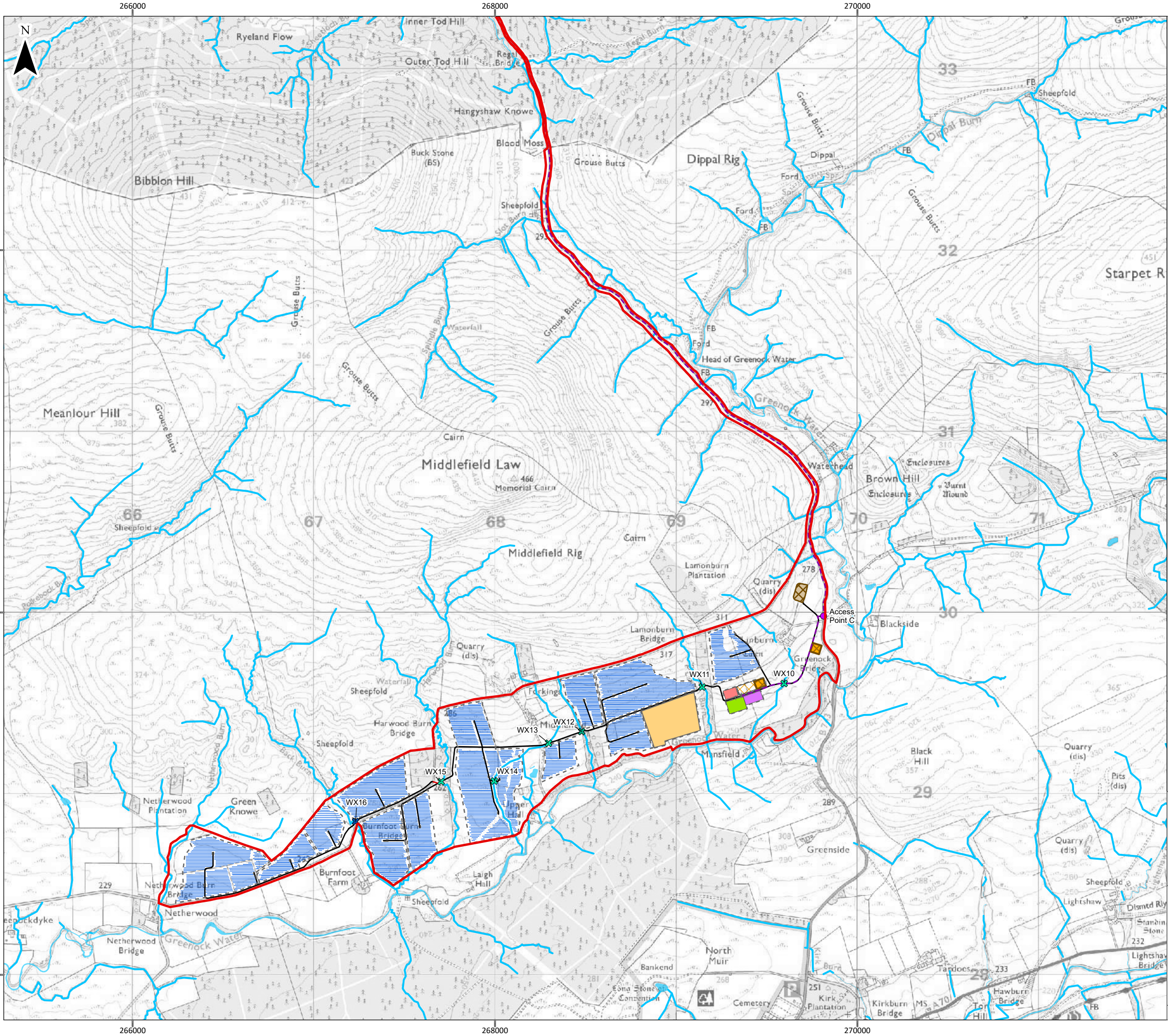
Scale 1:20,000 @ A3

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British National Grid Coordinate System



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Phase 1
EIA Report

TA 8.1 Figure 1b
Watercourse Crossing Location



Legend

Site Boundary

Underground Electricity Export Cable(s)

Solar PV Module

Solar Inverter

Long Duration Energy Storage

Short Duration Energy Storage

Proposed Development Substation

SPEN Substation

SPEN Temporary Compound

Temporary Construction Compound

Borrow Pit and Bund

Security Fence

Proposed Access Point

Access Tracks

Existing - Upgraded

Cut

Watercourse Crossing

New

Existing - Upgraded

Existing

Watercourse (OS OpenMap Local)

Waterbody (OS OpenMap Local)

00.250.50.751

Km

Scale 1:20,000 @ A3

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3R Energy

HAGSHAW ENERGY CLUSTER

WESTERN EXPANSION



Hagshaw Energy Cluster - Western Expansion
Phase 1
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TA 8.1 Figure 1c
Watercourse Crossing Location

Date: 31/03/2025

Drawn by: DB

Checked by: JC

Version: V1