

## 11 Water Environment

### 11.1 Introduction

- 11.1.1 This chapter assesses the potential effects on hydrology and hydrogeology associated with the construction and operation of the Proposed Development. This chapter (and its associated Figures and Appendices) is not intended to be read as a standalone assessment and reference should be made to the introductory chapters of this EIA Report (**Volume 2, Chapters 1- 5**).
- 11.1.2 The assessment has been carried out by Briony McIntosh (Consultant, Ramboll) who has five years' experience undertaking hydrological assessments. This chapter has been reviewed by Chris Day (Senior Consultant, Ramboll) who has 14 years' experience in a broad range of EIA assessments as a hydrologist.
- 11.1.3 This chapter is supported by the following figures and technical appendices:
- Volume 3a: Figures
    - **Figure 11.1: Surface Water Features;**
    - **Figure 11.2: Drinking Water Protected Areas;**
    - **Figure 11.3: Bedrock Geology;**
    - **Figure 11.4: Superficial Geology;**
    - **Figure 11.5: Hydrogeology;**
    - **Figure 11.6: Groundwater Dependent Terrestrial Ecosystems – National Vegetation Classification;**
    - **Figure 11.7: Hydrological Assessment of Groundwater Dependent Terrestrial Ecosystems;** and
    - **Figure 11.8: Private Water Supplies.**
  - Volume 4: Technical Appendices
    - **Technical Appendix 11.1: Watercourse Crossing Assessment;**
    - **Technical Appendix 11.2: Groundwater Dependent Terrestrial Ecosystems;**
    - **Technical Appendix 11.3: Private Water Supplies;** and
    - **Technical Appendix 11.4: Forestry Hydrology Assessment.**
- 11.1.4 Figures and technical appendices are referenced in the text where relevant.

### 11.2 Assessment Methodology and Significance Criteria

#### Scope of the Assessment

- 11.2.1 This chapter considers the likely effects of the Proposed Development on the water environment taking account of the hydrological and hydrogeological characteristics of the Site.
- 11.2.2 This chapter considers the likely effects on:
- Water quality (including both surface water and groundwater bodies) as a result of sedimentation and chemical pollution;
  - Flood risk and the potential for direct and indirect impacts of the Proposed Development on flood risk;
  - Flow regimes and the geomorphological characteristics of watercourses as a result of proposed watercourse crossings;
  - Any alterations to regimes of water supplying Private Water Supplies (PWSs) in the locale of the Proposed Development or within potential hydrological connection to the site; and

- The potential for the Proposed Development to impact hydrology or hydrogeology with secondary effects on Groundwater Dependent Terrestrial Ecosystems (GWDTes). Direct ecology or biodiversity effects (e.g. on sensitive habitats) are captured in **Chapter 8: Ecology (EIAR Volume 2)**.
- 11.2.3 The chapter also assesses cumulative effects as arising from the addition of the Proposed Development to other cumulative developments. **Figure 15.1: Cumulative Development (Volume 3a)** illustrates the Proposed Development along with other cumulative developments recorded as consented (under construction or not yet constructed), those in planning and those within the public domain, deemed reasonably foreseeable, within 15 km of the Proposed Development.
- 11.2.4 The assessment is based on the Proposed Development as described in **Chapter 2: Description of the Proposed Development (EIAR Volume 2)** and takes into account **Technical Appendix 2.2: Draft Outline Construction Environmental Management Plan (OCEMP, EIAR Volume 4)**.
- 11.2.5 The scope of the assessment has been informed by consultation responses summarised in **Table 11-1** and the following guidelines/policies:

#### *National Legislation and Policy*

- Water Environment and Water Services (Scotland) Act 2003;
- Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR);
- The Water Environment (Miscellaneous) (Scotland) Regulations 2017;
- Flood Risk Management (Scotland) Act 2009;
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017;
- The Public and Private Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2015;
- The Public Water Supplies (Scotland) Regulations 2014 (as amended 2017); and
- The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013.

#### *Guidance and Advice*

- CIRIA C736F Containment systems for the prevention of pollution (June 2014);
- Pollution Prevention Guidelines (PPG) 1: Understanding your environmental responsibilities - good environmental practices (July 2013);
- Guidance for Pollution Prevention Guidelines (GPP) 2: Above ground oil storage tanks (January 2018);
- GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer (November 2017);
- GPP 5: Works and maintenance in or near water (January 2017);
- PPG 6: Working at construction and demolition sites (2012);
- GPP 13 Vehicle washing and cleaning (April 2017);
- GPP 21: Pollution incident response planning (July 2017);
- PPG 22: Incident response - dealing with spills (October 2018);
- Planning Advice Note (PAN) 79: Water and Drainage (September 2006);
- LUPS-DP-GU2a: Development Plan Guidance on Flood Risk (2018);
- LUPS-GU19: Planning advice on wastewater drainage (2011);
- LUPS-GU31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems, Version 3 (September 2017);
- WAT-SG-25: Good Practice Guide - River Crossings (November 2010) ;
- WAT-SG-26: Good Practice Guide - Sediment Management (September 2010);

- WAT-SG-29: Good Practice Guide - Temporary Construction Methods (March 2009);
- WAT-SG-75: Sector Specific Guidance: Construction Sites;
- WAT-PS-06-02: Culverting of Watercourses (June 2015);
- SEPA (2015), CAR - A Practical Guide, Version 8.4 (October 2019); and
- Scottish Government (2012) River Crossings and Migratory Fish.

### Extent of the Study Area

- 11.2.6 The Study Area covers a 500 m buffer around the Proposed Development as well as watercourses and Private Water Supplies (PWS) with downstream hydrological connectivity to the Site as certain effects could extend across a larger catchment area.

### Consultation Undertaken to Date

- 11.2.7 Consultation undertaken to date mainly pertains to the EIA Scoping. Scoping responses received at the time of writing that are relevant to this chapter are captured in **Table 11-1**. Further information can be found in **Appendix 4.3: Consultation Register (EIAR Volume 4)**.

**Table 11-1: Scoping Responses and Other Consultations of Relevance to Chapter 11**

Organisation	Type of Consultation	Response	How response has been considered
ECU	Scoping Opinion, June 2022	Scottish Water provided information on whether there are any drinking water protected areas or Scottish Water assets on which the development could have any significant effect. Scottish Ministers request that the company contacts Scottish Water and makes further enquires to confirm whether there any Scottish Water assets which may be affected by the development, and includes details in the EIA report of any relevant mitigation measures to be provided.	Scottish Water asset plans were obtained for the route of the OHL. No assets are indicated to fall within the 500 m buffer of the Proposed Development.  The Appointed Contractor will be responsible for confirming the presence of Scottish Water assets and would liaise directly with Scottish Water to achieve the appropriate consents if any potential conflict was identified.
		Scottish Ministers request that the Company investigates the presence of any private water supplies which may be impacted by the development. The EIA report should include details of any supplies identified by this investigation, and if any supplies are identified, the Company should provide an assessment of the potential impacts, risks, and any mitigation which would be provided.	A list of PWSs were supplied by ABC. These are shown in <b>Figure 11.8: Private Water Supplies (EIAR Volume 3a)</b> . A detailed assessment of PWSs with the potential to be impacted by the proposed development can be found in <b>Technical Appendix 11.3: Private Water Supply Assessment</b> , and the results of the assessment are summarised in <b>Section 11.4</b> of this chapter.
SEPA	Scoping Response, March 2022	Avoiding good quality or rare GWDTE habitats and minimising impacts on other GWDTE habitats must be addressed into the EIAR.	The Proposed Development has avoided sensitive habitats through the design process as set out in <b>Chapter 2: Development Description</b> and <b>Chapter 8: Ecology (EIAR Volume 2)</b> . GWDTEs are considered in <b>Section 11.6</b> and <b>Technical Appendix 11.2: Groundwater Dependent Terrestrial</b>

Organisation	Type of Consultation	Response	How response has been considered
			<p><b>Ecosystem Assessment (EIAR Volume 4).</b> In addition, direct impacts to sensitive habitats are covered in <b>Chapter 8: Ecology (EIAR Volume 2).</b></p>
		<p>Avoiding impacts on watercourses and other water features by ensuring suitable buffers and using best practice design crossings must be addressed in the EIAR.</p>	<p>Whilst the preferred 50 m buffer is acknowledged, many of the water features are smaller drains and it has not been possible to avoid a 50 m buffer along the entire Proposed Development (as shown in <b>Figure 11.1: Surface Water Features, (EIAR Volume 3a).</b></p> <p>Design of watercourse crossings would be the responsibility of the Appointed Contractor and would adhere to the appropriate CIRIA and SEPA guidance as set out in <b>Section 11.2.</b></p>
		<p>The site layout must be designed to avoid impacts upon the water environment. Where activities such as watercourse crossings, watercourse diversions or other engineering activities in or impacting on the water environment cannot be avoided then the submission must include justification of this and a map showing:</p> <p>All proposed temporary or permanent infrastructure overlain with all lochs and watercourses.</p>	<p>The Proposed Development has avoided impacts on the water environment through the design process as set out in <b>Chapter 3: Alternatives (EIAR Volume 2).</b> Where the Proposed Development interacts with the water environment is shown in <b>Figure 11.1: Surface Water Features (EIAR Volume 3a).</b> An assessment of watercourse crossings has been made in <b>Technical Appendix 11.1: Watercourse Crossing Assessment</b> which is supported by <b>Figure 11.1.1 (EIAR Volume 4)</b> identifying the crossing locations.</p>
		<p>A minimum buffer of 50 m around each loch or watercourse. If this minimum buffer cannot be achieved each breach must be numbered on a plan with an associated photograph of the location, dimensions of the loch or watercourse and drawings of what is proposed in terms of engineering works.</p>	<p>Whilst the preferred 50 m buffer is acknowledged it has not been possible to avoid a 50 m buffer along the entire route. This is a result of engineering constraints which include constraints on tower positioning due to terrain or topography and to achieve the required clearances on the OHL spans.</p> <p>The majority of towers have been located outwith a 30 m buffer of watercourses, and many of the water features are smaller drains (<b>Figure 11.1: Surface Water Features, EIAR Volume 3a).</b> Based on previous experience, a 30 m buffer is considered a suitable distance as the construction of the towers are not</p>

Organisation	Type of Consultation	Response	How response has been considered
			anticipated to result in significant changes to hydrological conditions.
		Detailed layout of all proposed mitigation including all cut off drains, location, number and size of settlement ponds.	The Appointed Contractor would be responsible for drafting detailed drainage plans prior to construction.
		If water abstractions or dewatering are proposed, a table of volumes and timings of groundwater abstractions and related mitigation measures must be provided.	The Appointed Contractor would be responsible for providing this information to SEPA prior to construction.
		Watercourse crossings must be designed to accommodate the 0.5% Annual Exceedance Probability (AEP) flows, or information provided to justify smaller structures. If it is thought that the development could result in an increased risk of flooding to a nearby receptor then a Flood Risk Assessment must be submitted in support of the planning application.	Design of watercourse crossings would be the responsibility of the Appointed Contractor and would adhere to the appropriate CIRIA and SEPA guidance as set out in <b>Section 11.2</b> .
		A map demonstrating that all GWDTE are outwith a 100 m radius of all excavations shallower than 1m and outwith 250 m of all excavations deeper than 1 m and proposed groundwater abstractions. If micro-siting is to be considered as a mitigation measure the distance of survey needs to be extended by the proposed maximum extent of micro-siting.  The survey needs to extend beyond the site boundary where the distances require it.	The locations of habitats with a potential to be GWDTE are shown in <b>Figure 11.5: Groundwater Dependent Terrestrial Ecosystems – NVC</b> , and <b>Figure 11.6: Hydrological Assessment of Groundwater Dependent Terrestrial Ecosystems (EIAR Volume 3a)</b> . Private water supply abstractions are shown in <b>Figure 11.8: Private Water Supplies (EIAR Volume 3a)</b> .
		If the minimum buffers above cannot be achieved, a detailed site specific qualitative and/or quantitative risk assessment will be required. We are likely to seek conditions securing appropriate mitigation for all GWDTE affected.	A detailed assessment of GWDTEs is provided in <b>Technical Appendix 11.2: Groundwater Dependent Terrestrial Ecosystems Assessment (EIAR Volume 4)</b> , which includes potential mitigation. Mitigation is also summarised in <b>Section 11.5</b> of this chapter and would ultimately be set out in the CEMP, which would be secured through a planning condition. A separate planning condition relating to GWDTE habitats is not, therefore considered necessary.
		Excavations and other construction works can disrupt groundwater flow and impact on existing groundwater abstractions. The submission must include:  a) A map demonstrating that all existing groundwater abstractions are outwith a	Six PWSs are within 250 m of the Proposed Development and are shown in <b>Technical Appendix 11.3, Figure 11.3.2, EIAR Volume 4</b> .  The Appointed Contractor would be responsible for undertaking detailed

Organisation	Type of Consultation	Response	How response has been considered
		<p>100 m radius of all excavations shallower than 1 m and outwith 250 m of all excavations deeper than 1 m and proposed groundwater abstractions. If micro-siting is to be considered as a mitigation measure the distance of survey needs to be extended by the proposed maximum extent of micro-siting. The survey needs to extend beyond the site boundary where the distances require it.</p> <p>If the minimum buffers above cannot be achieved, a detailed site specific qualitative and/or quantitative risk assessment will be required. We are likely to seek conditions securing appropriate mitigation for all existing groundwater abstractions affected.</p>	<p>pre-construction PWS surveys and implementing mitigation (set out in <b>Section 11.5 and Technical Appendix 11.3: Private Water Supply Assessment, EIAR Volume 4</b>).</p>
Scottish Water	Scoping Response, April 2022	<p>A review of our records indicates that the proposed activity falls partly within a drinking water catchment where a Scottish Water abstraction is located. Scottish Water abstractions are designated as Drinking Water Protected Areas (DWPA) under Article 7 of the Water Framework Directive. The Cladich Intake catchment supplies Cladich Water Treatment Works (WTW) and it is essential that water quality and water quantity in the area are protected. In the event of an incident occurring that could affect Scottish Water we should be notified without delay using the Customer Helpline number 0800 0778 778 and local Scottish Water contact details will be provide prior to construction work commencing.</p>	<p>The Proposed Development is not within, or within 500 m of, the catchment area of the Cladich Water Drinking Water Protected Area (DWPA) (<b>Figure 11.2: Drinking Water Protected Areas, EIAR Volume 3a</b>). The Proposed Development falls entirely within the River Aray catchment.</p>
		<p>The chosen route will run through the Cladich Intake catchment therefore there is a risk to drinking water quality as previously discussed Scottish Water and in particular the Sustainable Land Management team will need to be heavily involved in the project.</p>	<p>The Proposed Development does not run through the Cladich Intake catchment, or within 500 m of the DWPA (<b>Figure 11.2: Drinking Water Protected Areas, EIAR Volume 3a</b>).</p>
		<p>We will need to see copies of Pollution Prevention Plans and any CEMP documents as they are developed.</p>	<p>The Appointed Contractor will be responsible for drafting the final Construction Environmental Management Plan (CEMP) and Pollution Prevention Plan (PPPs), and sharing these with the appropriate statutory consultees in advance of construction.</p>

Organisation	Type of Consultation	Response	How response has been considered
		<p>There are also a number of Scottish Water assets along the route. There is a 4" asbestos cement (AC) and a 125 mm medium-density polyethylene (MDPE) water distribution main near the northeast end of the route. These pipes appear to be in the road verge running past the substation. A separate 4" AC water distribution main follows the route of the B8077 and there is also a 3" AC raw water main near Claddich running northeast from the raw water intake (RWI). This should be confirmed however through obtaining plans from our Asset Plan Providers. Details of our Asset Plan Providers are included in the SW list of precautions for assets, which can be found on the activities within our catchments page of our website at <a href="http://www.scottishwater.co.uk/slm">www.scottishwater.co.uk/slm</a>.</p>	<p>Scottish Water asset plans were obtained for the route of the OHL. No assets are indicated to fall within the 500 m buffer of the Proposed Development.</p> <p>The Appointed Contractor will be responsible for confirming the presence of Scottish Water assets and would liaise directly with Scottish Water to achieve the appropriate consents if any potential conflict was identified.</p>
		<p>All Scottish Water assets potentially affected by the activity should be identified, with particular consideration being given to access roads and pipe crossings. If necessary, local Scottish Water personnel may be able to visit the site to offer advice. All of Scottish Water's processes, standards and policies in relation to dealing with asset conflicts must be complied with.</p>	<p>The Appointed Contractor will be responsible for confirming the presence of Scottish Water assets and would liaise directly with Scottish Water to achieve the appropriate consents if any potential conflict was identified.</p>
		<p>In the event that asset conflicts are identified then early contact should be made with HAUC Diversions Team via the Development Services portal. All detailed design proposals relating to the protection of Scottish Water's assets should be submitted to the HAUC for review and written acceptance. Works should not take place on site without prior written acceptance by Scottish Water.</p>	<p>The Appointed Contractor will be responsible for confirming the presence of Scottish Water assets and would liaise directly with Scottish Water to achieve the appropriate consents if any potential conflict was identified.</p>
		<p>Scottish Water have produced a list of precautions for a range of activities. The list of precautions for assets details protection measures to be taken if there are assets in the area. Please note that site specific risks and mitigation measures will require to be assessed and implemented. The document/s and other supporting information can be found on the activities within our catchments page of our website at <a href="http://www.scottishwater.co.uk/slm">www.scottishwater.co.uk/slm</a>.</p>	<p>The Appointed Contractor will be responsible for confirmation the presence of Scottish Water assets and detailing the mitigation measures required in consultation with Scottish Water if any potential conflict was identified.</p>



Organisation	Type of Consultation	Response	How response has been considered
		<p>It should be noted that the proposals will be required to comply with Sewers for Scotland and Water for Scotland 4th Edition 2018, including provision of appropriate clearance distances from Scottish Water assets.</p>	<p>The Appointed Contractor will be responsible for confirmation of the presence of Scottish Water assets and complying with the appropriate legislation.</p>
		<p>Scottish Water have produced a list of precautions for a range of activities. This details protection measures to be taken within a DWPA, the wider drinking water catchment and if there are assets in the area. Please note that site specific risks and mitigation measures will require to be assessed and implemented. These documents and other supporting information can be found on the activities within our catchments page of our website at <a href="http://www.scottishwater.co.uk/slm">www.scottishwater.co.uk/slm</a>.</p>	<p>The Proposed Development is not within, or within 500 m of, a Scottish Water DWPA (<b>Figure 11.2: Drinking Water Protected Areas (EIAR Volume 3a)</b>). The Appointed Contractor will be responsible for confirmation of the presence of Scottish Water assets and would liaise directly with Scottish Water to assess and achieve the appropriate mitigation if any potential conflict was identified.</p>
		<p>The fact that this area is located within a drinking water catchment should be noted in future documentation. Also anyone working on site should be made aware of this during site inductions.</p> <p>We would request further involvement at the more detailed design stages, to determine the most appropriate proposals and mitigation within the catchment to protect water quality and quantity.</p>	<p>The Proposed Development is not within, or within 500 m of the DWPA as shown in <b>Figure 11.2: Drinking Water Protected Areas, EIAR Volume 3a</b>.</p>
		<p>We would also like to take the opportunity, to request that 3 months' notice is given in advance of any works commencing on site, Scottish Water must be notified at <a href="mailto:protectdwsources@scottishwater.co.uk">protectdwsources@scottishwater.co.uk</a>. This will enable us to be aware of activities in the catchment and to arrange a site meeting, which will be necessary.</p>	<p>The Appointed contractor would be responsible for notifying Scottish Water in advance of any construction works taking place.</p>
		<p>For reasons of sustainability and to protect our customers from potential future sewer flooding, Scottish Water will not accept any surface water connections into our combined sewer system.</p> <p>There may be limited exceptional circumstances where we would allow such a connection for brownfield sites only, however this will require significant justification from the customer taking account of various factors including legal, physical, and technical challenges.</p>	<p>The Appointed Contractor will be responsible for detailed drainage design and should take this into consideration.</p>



Organisation	Type of Consultation	Response	How response has been considered
		<p>In order to avoid costs and delays where a surface water discharge to our combined sewer system is anticipated, the developer should contact Scottish Water at the earliest opportunity with strong evidence to support the intended drainage plan prior to making a connection request. We will assess this evidence in a robust manner and provide a decision that reflects the best option from environmental and customer perspectives.</p>	
		<p>If the connection to the public sewer and/or water main requires to be laid through land out-with public ownership, the developer must provide evidence of formal approval from the affected landowner(s) by way of a deed of servitude.</p>	<p>The Appointed Contractor will be responsible for detailed drainage design and should take this into consideration.</p>
		<p>Scottish Water may only vest new water or waste water infrastructure which is to be laid through land out with public ownership where a Deed of Servitude has been obtained in our favour by the developer.</p>	<p>The Appointed Contractor will be responsible for detailed drainage design and should take this into consideration.</p>
		<p>The developer should also be aware that Scottish Water requires land title to the area of land where a pumping station and/or SuDS proposed to vest in Scottish Water is constructed.</p>	<p>The Appointed Contractor will be responsible for detailed drainage design and should take this into consideration.</p>
		<p>All proposed developments require to submit a Pre-Development Enquiry (PDE) Form to be submitted directly to Scottish Water via our Customer Portal prior to any formal Technical Application being submitted. This will allow us to fully appraise the proposals.</p> <p>Where it is confirmed through the PDE process that mitigation works are necessary to support a development, the cost of these works is to be met by the developer, which Scottish Water can contribute towards through Reasonable Cost Contribution regulations</p>	<p>The Appointed Contractor would be responsible for submitting all appropriate documentation in advance of construction.</p>
		<p>Certain discharges from non-domestic premises may constitute a trade effluent in terms of the Sewerage (Scotland) Act 1968. Trade effluent arises from activities including; manufacturing, production and engineering; vehicle, plant and equipment washing, waste and leachate</p>	<p>Whilst there is no anticipated requirement for trade effluent discharge, the Appointed Contractor would be responsible for submitting all appropriate documentation in advance of construction.</p>

Organisation	Type of Consultation	Response	How response has been considered
		<p>management. It covers both large and small premises, including activities such as car washing and laundrettes. Activities not covered include hotels, caravan sites or restaurants.</p> <p>Trade effluent must never be discharged into surface water drainage systems as these are solely for draining rainfall run off.</p>	

### Effects Scoped Out

- 11.2.8 The Proposed Development would not have a fixed operational life as it is assumed to be operational for 50 years or more. Effects associated with the construction phase can be considered to be representative of the worst-case decommissioning effects and therefore decommissioning effects have been scoped out.

#### *Flood Risk*

- 11.2.9 A review of the SEPA online Flood Maps<sup>1</sup> indicates low lying areas in close proximity to the River Aray have a High likelihood (areas assessed to be at a 1 in 10 year, or 10% annual probability (AP)) of flooding. These areas are confined to land in close proximity to and situated downslope to the east of the Proposed Development on lower lying areas of Glen Aray.
- 11.2.10 The Proposed Development crosses an unnamed watercourse at Drimfern and the Erallich Water which are also shown to be at High likelihood of flooding. The areas at risk of flooding are also confined to land in close proximity to the Eralich Water and unnamed watercourse at Drimfern.
- 11.2.11 Although the Proposed Development crosses areas considered to be at High likelihood of flooding, the flood extents are primarily confined to the land immediately adjacent to the watercourses. The majority of the Proposed Development within the flood extent areas is OHL which will be strung above watercourses, where possible, towers have been located outwith a 30 m buffer of watercourses which would reduce the interaction between flood risk areas and infrastructure. During periods of heavy rain where flood risk could be higher, construction activities close to watercourses will be avoided.
- 11.2.12 Micrositing of infrastructure outwith areas of potential flood risk would be considered at detailed design. It is also noted that the proposed towers themselves, once installed, would not be vulnerable to flood waters. A further detailed assessment of potential vulnerability to flood risk has therefore been scoped out of further assessment.
- 11.2.13 Detailed assessment of potential flow rates at proposed watercourse crossing locations would be carried out by a contractor at the detailed design stage such that all of the watercourse crossings identified for the Proposed Development would be designed in compliance with requirements of The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) as amended. The design of watercourse crossings would also take account of the future 'with climate change' baseline, and, to avoid altering the flow regime, would be sized for a 1 in 200 year (0.5% AP) plus climate change flood event. Detailed flow rate calculations have not been carried out within this assessment.
- 11.2.14 The contractor at the detailed design stage would be responsible for designing Site drainage such that runoff rates are maintained equivalent to the pre-development greenfield situation.

<sup>1</sup> SEPA Flood Maps. Flood Hazard and Flood Risk Information. <https://map.sepa.org.uk/floodmaps> [Accessed March 2022]

## Method of Baseline Data Collation

### *Desk Study*

11.2.15 The methodology for baseline characterisation is set out as follows:

- describe surface water hydrology, including watercourses, springs and lochs;
- describe the geology of the Site, including bedrock and superficial deposits;
- describe the hydrogeological conditions;
- describe the hydromorphological conditions of watercourses;
- collect soil, geological and hydrological information; and
- confirm surface water catchment areas and watersheds.

11.2.16 Published information consulted to determine the baseline conditions include:

- Ordnance Survey (OS) 1:10,000, 1:25,000 and 1:50,000 mapping;
- 5 m Digital Terrain Model (DTM) data;
- Aerial imagery (ESRI world imagery);
- British Geological Survey (BGS) Geology of Britain Viewer<sup>2</sup> for superficial and bedrock;
- BGS Hydrogeological and Groundwater Vulnerability Maps of Scotland (1:625,000);
- SEPA Flood Maps web mapping<sup>3</sup>;
- SEPA Water Environment Hub<sup>4</sup>; and
- Scottish Government: Drinking Water Protected Areas – Scotland river basin district maps<sup>5</sup>.

### *Field Survey*

11.2.17 A site walkover was conducted by two Ramboll hydrologists on the 7 and 8 March 2022. Briony McIntosh has over five years' experience surveying and is a qualified River Habitat Surveyor, and was accompanied by Hannah Otton who has more than three years survey experience. All data was captured digitally using tablets. Weather conditions on both days were dry and clear. Ground conditions were relatively dry and river levels low to normal.

11.2.18 The purpose of the site walkover was to (i) assess the general hydrological condition of the Site, (ii) characterise watercourses at the Site such that potential impacts of watercourse crossings may be assessed, and (iii) assess hydrological conditions to inform assessment of potential GWDTE sites. The survey consisted of visual inspection and geolocated surveying of watercourses along the Proposed Development.

### *Limitations and Assumptions*

11.2.19 This assessment refers to and uses publicly available data sources and site-specific survey for the Proposed Development which is considered robust and sufficient to enable this assessment to be compiled.

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<sup>2</sup> <https://mapapps.bgs.ac.uk/geologyofbritain/home.html> [Accessed August 2022]

<sup>3</sup> <https://map.sepa.org.uk/floodmaps> [Accessed August 2022]

<sup>4</sup> <https://www.sepa.org.uk/data-visualisation/water-environment-hub/> [Accessed August 2022]

<sup>5</sup> <https://www.gov.scot/publications/drinking-water-protected-areas-scotland-river-basin-district-maps/> [Accessed August 2022]

## Method of Assessment

### Sensitivity of Receptor

- 11.2.20 Effects on water resources are described as beneficial, neutral or adverse and are considered with reference to the value or sensitivity of the receptor, as described in **Table 11-2**.

**Table 11-2: Sensitivity of Receptor**

Sensitivity of Receptor	Definition	Typical Criteria
High	International or national level importance.	<ul style="list-style-type: none"> <li>High likelihood of fluvial/ tidal flooding in the sub catchment - defined as 10% AP event.</li> <li>EC Designated Salmonid/ Cyprinid fishery.</li> <li>Surface Water Framework Directive (WFD) class 'High'.</li> <li>Scottish Government Drinking Water Protected Areas.</li> <li>Aquifer providing regionally important resource such as abstraction for public water supply, abstraction for PWS.</li> <li>Protected Bathing Water Area.</li> <li>Active floodplain.</li> <li>Highly GWDTE.</li> </ul>
Medium	Regional, county and district level importance. Receptor with a medium quality and rarity, regional scale and limited potential for substitution/ replacement.	<ul style="list-style-type: none"> <li>Medium likelihood of fluvial/ tidal flooding in the sub-catchment - defined as a 0.5% AP event</li> <li>Surface water WFD class 'Good' or 'Moderate'.</li> <li>Aquifer providing water for agricultural or industrial use.</li> <li>Local or regional ecological status / locally important fishery.</li> <li>Contains some flood alleviation features.</li> <li>Moderately GWDTE.</li> </ul>
Low	Local importance. Receptor is on-site or on a neighbouring site with a low quality and rarity, local scale. Environmental equilibrium is stable and is resilient to changes that are greater than natural fluctuations, without detriment to its present character.	<ul style="list-style-type: none"> <li>Surface water WFD class 'Poor'.</li> <li>Unproductive strata/ no abstractions for water supply.</li> <li>Sporadic fish present.</li> <li>No flood alleviation features.</li> <li>Sewer.</li> <li>Potential GWDTE confirmed to be of low sensitivity to change due to heavily modified underlying groundwater bodies.</li> </ul>

### Magnitude of Impact

- 11.2.21 The size or magnitude of each impact is determined as a predicted deviation from the baseline conditions during construction, operation and decommissioning as described in **Table 11-3**.

**Table 11-3: Magnitude of Change**

Magnitude of Impact	Criteria
High	Large alteration/ change in the quality or quantity of and/ or to the physical or biological characteristics of environmental resource.
Medium	Medium alteration/ change in the quality or quantity of and/ or to the physical or biological characteristics of environmental resource.
Low	Small alteration/ change in the quality or quantity of and/ or to the physical or biological characteristics of environmental resource.
Negligible	No alteration/ change detectable in the quality or quantity of and/ or to the physical or biological characteristics of environmental resource.

### *Cumulative Effects*

- 11.2.22 Potential cumulative environmental impacts to water resources have been assessed where concurrent proposed developments or construction activity may be in hydrological connection with the Proposed Development, or water resource receptors.
- 11.2.23 Where potential cumulative impacts are identified, the same criteria as used for assessment of the Proposed Development have been employed.

### *Significance Criteria*

- 11.2.24 **Table 11-4** illustrates how residual effects are determined by comparison of the sensitivity of receptors with the magnitude of predicted change. For the purposes of this assessment significant effects, in the context of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017<sup>6</sup>, are major or major/moderate.

**Table 11-4: Residual Effects**

Sensitivity	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major/moderate	Moderate	Moderate/ minor
Medium	Major/moderate	Moderate	Moderate/ minor	Minor
Low	Moderate	Moderate/ minor	Minor	Minor / none

## 11.3 Baseline Conditions

### Current Baseline

#### *Surface Hydrology*

- 11.3.1 The Proposed Development is located wholly within the catchment of the River Aray. The River Aray flows in a southerly direction from the proposed Creag Dhubh Substation eventually discharging into Loch Fyne approximately 3 km south of the Inveraray – Crossaig connection point.

<sup>6</sup> <http://www.legislation.gov.uk/ssi/2017/101/contents/made>

- 11.3.2 The proposed Creag Dhubh Substation is located close to the upstream source area of the River Aray. The Proposed Development runs in a southerly direction to the west of the River Aray but does not cross it. The Proposed Development does, however, cross a large number of tributaries that flow in an easterly direction into the River Aray. The Erallich Water is the largest tributary crossed with the remaining watercourses unnamed burns typically <1 m in width and <0.5 m in depth.
- 11.3.3 A number of ephemeral streams were also observed during the walkover, particularly across the open grazed land between Stromnagachan and North Tullich. These features are not considered to represent formal watercourses. They do not have a defined channel and are preferential drainage routes during periods of high surface water runoff.
- 11.3.4 One spring was identified at Ordnance Survey National Grid Reference NN 08967 16797.
- 11.3.5 Surface water features are shown in Figure 11.1: Surface Water Features (EIAR Volume 3a).

#### *Water Quality*

- 11.3.6 The River Aray (ID 10225) was assessed by SEPA<sup>7</sup> in 2020 as being of 'Moderate' overall status under the Water Framework Directive classification scheme and being of 'Moderate' ecological status and 'Good' Physico-Chemical status.
- 11.3.7 The Erallich Water (ID 10225) is the largest tributary crossed by the Proposed Development and was classified by SEPA in 2020 as being in 'Moderate' overall condition. None of the other tributaries are assessed under the Water Framework Directive.
- 11.3.8 The Proposed Development is not situated within a Scottish Government Surface Water Drinking Water Protected Area (DWPA). The nearest DWPA is situated approximately 700 m to the north east of the River Aray and the proposed Creag Dhubh substation (the Cladich Water DWPA) and is therefore not in hydrological connection to the Proposed Development (**Figure 11.2: Drinking Water Protected Areas, EIAR Volume 3a**). A second DWPA is located 4.5 km to the south of the Proposed Development.

#### *Geology and Hydrogeology*

- 11.3.9 According to the BGS bedrock geology mapping, the northern end of the Proposed Development is underlain by unnamed extrusive rocks (mafic lava and mafic tuff). The remainder of the Proposed Development is underlain by the Argyll Group consisting of psammite, semipelite and pelite (**Figure 11.3: Bedrock Geology, EIAR Volume 3a**).
- 11.3.10 The BGS superficial geology mapping indicates the glacial till deposits (diamicton) are present in the northernmost and southernmost areas of the Proposed Development (**Figure 11.4: Superficial Geology, EIAR Volume 3a**).
- 11.3.11 According to BGS 1:625,000 scale hydrogeological mapping the whole Proposed Development is underlain by aquifers of a Low Productivity (**Figure 11.5: Hydrogeology, EIAR Volume 3a**), in which flow is virtually all through fractures and other discontinuities. Aquifers underlying the Proposed Development are considered unlikely to support public water supplies, or to have the potential to do so.

#### *Groundwater Dependent Terrestrial Ecosystems*

- 11.3.12 Ecological surveying, including National Vegetation Classification (NVC) surveys, was carried out by Ramboll in March 2022. The surveys identified a number of habitats across the Site with potential (based on species present only) to be Highly or Moderately groundwater dependent vegetation communities. Detailed

<sup>7</sup> SEPA Water Environment hub. <https://www.sepa.org.uk/data-visualisation/water-environment-hub/> [Accessed March 2022]

descriptions of GWDTes are provided in **Chapter 8: Ecology (EIAR Volume 2)** and **Technical Appendix 11.2: Groundwater Dependent Terrestrial Ecosystem Assessment (EIAR Volume 4)**.

- 11.3.13 Based on the NVC surveying, further desk-based assessment of the hydrological context of potential GWDTes was carried out. Full details of the assessment are provided in **Technical Appendix 11.2: Groundwater Dependent Terrestrial Ecosystem Assessment (EIAR Volume 4)**.
- 11.3.14 In summary, based on the connectivity of the majority of the Highly and Moderately GWDTe habitats to watercourses or surface water flow paths, which are considered to present a greater contributing source of water input to the habitat than groundwater, the majority of these habitats are not considered to be dependent on groundwater. In addition, the underlying bedrock aquifer is assessed by the BGS to be of Low productivity, with limited groundwater in the near surface weathered zone and secondary fractures. Therefore, the underlying hydrogeology also supports the conclusion that it is likely the majority of GWDTes are not fed by a groundwater aquifer.
- 11.3.15 The potential GWDTe habitats are also located primarily on open, rough grazed steep hillslopes where ephemeral watercourses and runoff downslope were observed during the site visit, and where flora and drainage pathways have been altered by grazing over time. There were also habitats with a Moderate GWDTe potential indicated in the forestry rides at locations where forest drainage converges, such that there will be a high surface water contribution to the habitats and the habitats are not therefore considered to have formed due to significant groundwater contribution and are not considered to be GWDTes.
- 11.3.16 The majority of the Site is therefore assessed to be of Low sensitivity with regards to GWDTes as the majority of the NVC habitats have been assessed as not being groundwater dependent.
- 11.3.17 However, one spring was identified at Ordnance Survey National Grid Reference (OS NGR) NN 08967 16797 and lies within an area mapped as Moderate GWDTe where a contribution from groundwater cannot be discounted. This habitat is considered potentially a sensitive GWDTe.

#### *Private Water Supplies*

- 11.3.18 A list of PWSs was supplied by Argyll and Bute Council (ABC). The council records are often incomplete in rural areas, and often identify the property rather than the source and / or collection tank associated with the PWS. Therefore, SSEN Transmission contacted properties along the Proposed Development to confirm the location and details of their supplies.
- 11.3.19 The location of PWSs from both the ABC records and information supplies by local residents and / or landowners are shown in **Figure 11.8: Private Water Supplies (EIAR Volume 3a)**.
- 11.3.20 Twelve PWSs have been identified which are either within 250 m of, or considered in potential hydrological connectivity to, the Proposed Development (see **Table 11-5**). These PWSs have been assessed further in **Technical Appendix 11.3: Private Water Supply Assessment (EIAR Volume 4)**. Three of the supplies (10, 12 and 13, **Table 11-5**) are not anticipated to be impacted by the Proposed Development due to their distance from proposed infrastructure.

**Table 11-5: Private Water Supplies in Hydrological Connectivity to the Proposed Development**

Figure Reference	PWS Name	Source Type	Easting	Northing	Distance from Infrastructure
1	North Tullich	Surface water runoff	207748	715927	Source 742 m Holding tank 28 m
2	West Drimfern	Surface water runoff	208091	714801	285 m



Figure Reference	11.8	PWS Name	Source Type	Easting	Northing	Distance from Infrastructure
3		Druimbreac	Surface water runoff	208087	714643	385 m
4		Stronmagachan	Unknown	208057	714106	682 m
5		Sallachry East	Surface water runoff	207669	712249	103 m
6		Sallachry East	Surface water runoff	207684	712341	288 m
7		Stronmagachan	Unknown	208240	712249	106 m
8		Three Bridges	Unknown	208700	712502	517 m
9		High Balantyre	Surface water runoff	207791	711649	144 m
10		Eas a Chleibh	Unknown	208794	711755	782 m
12		Black Bull Cottage and Low Balantyre Cottage	Unknown	208484	711145	505 m
13		Balantyre Lodge	Unknown	208558	710936	360 m

### Future Baseline

- 11.3.21 There is potential for climate change to impact on future baseline conditions. UK Climate Projections (UKCP) predict a decrease in summer precipitation but with an increase in the frequency and intensity of rainfall events that do occur, and an increase in winter precipitation alongside slightly higher average temperatures<sup>8</sup>. This suggests that there may be greater pressures on PWSs, and impacts to GWDTEs, in summer months in the future. Summer storms are predicted to be of greater intensity. Therefore, peak fluvial flows associated with extreme storm events may also increase in volume and velocity. These climate change factors have been taken into account when considering the potential for likely significant effects.
- 11.3.22 In the absence of the Proposed Development, the morphology and hydrological regime of watercourses directly under the Proposed Development and proposed wayleave either side of the OHL (the 'Operational Corridor' (OC)) are likely to continue to be present in their current form.
- 11.3.23 It is assumed that forestry felling shall continue in line with the Long Term Felling Plans (LTFP) in place along the Proposed Development. Existing management proposals for forestry felling within the Study Area are taken into account in the Forestry Hydrology Assessment (**Technical Appendix 11.4, EIAR Volume 4**).

### Sensitive Receptors

- 11.3.24 The sensitivity of the baseline receptors is summarised in **Table 11-6**.

<sup>8</sup> Met Office. July 2021. UK Climate Projections: Headline Findings. Version 3.0.

[https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18\\_headline\\_findings\\_v3.pdf](https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18_headline_findings_v3.pdf) [Accessed April /22]

**Table 11-6: Summary of Sensitive Receptors**

Receptor	Sensitivity	Justification
Surface Water	Medium	The River Aray and River Eralich are classified as being in overall 'Moderate' condition.
Groundwater	Low	The Site is underlain by a low productivity aquifer, according to the BGS.
GWDTEs	Low (with the exception of the spring which is considered high)	<p>Hydrological assessment of potential GWDTE communities within the vicinity of the proposed development, as identified through NVC survey has shown these habitats are unlikely to be groundwater dependent.</p> <p>The NVC communities are closely linked to surface water features and ombrotrophic bog and are therefore considered to be of low sensitivity with regard to groundwater dependency.</p> <p>Watercourses associated with these habitats are considered to be of medium sensitivity.</p> <p>A contribution from shallow groundwater cannot be discounted for the spring which is therefore considered to be of High Sensitivity.</p>
PWSs	High	<p>Five PWSs are within 250 m of the Proposed Development:</p> <ul style="list-style-type: none"> <li>• The holding tank at North Tullich is 28 m from proposed infrastructure;</li> <li>• Sallachry East is 103 m from proposed infrastructure;</li> <li>• Stronmagachan is 106 m from proposed infrastructure;</li> <li>• Three Bridges is 71 m from an existing access track to be utilised; and</li> <li>• High Balantyre is 144 m upstream of T33.</li> <li>• Several others are located downstream of the Proposed Development with infrastructure falling within the PWS catchment areas.</li> </ul>

## 11.4 Assessment of Effects

### Mitigation by Design

- 11.4.1 The layout of the Proposed Development has, as far as possible, been designed to avoid direct effects on watercourses, PWSs and sensitive habitats, as detailed in **Chapter 3: Alternatives** and **Chapter 8: Ecology (EIAR Volume 2)**.
- 11.4.2 The Proposed Development has been designed to avoid watercourses where possible, however it was not possible to maintain a 50 m buffer in all cases. This was primarily due to engineering constraints dictating tower locations to place towers in topographically suitable areas and to achieve the required clearances on the OHL spans. In most cases the towers have maintained a 30 m buffer from watercourses, several of which were found to be smaller drainage features following the site visit. The Proposed Development was also designed to minimise the number of watercourse crossings required. **Technical Appendix 11.1: Watercourse Crossing Assessment (EIAR Volume 4)** sets out principles of best practice for watercourse crossing design.

- 11.4.3 The design of access tracks shall be carried out in line with best practice measures and will be detailed in the CEMP to be prepared by the contractor such that track construction shall not significantly alter habitat drainage regimes. Drainage measures incorporated into track design would ensure the continued hydrological connectivity of habitats and prevent increases in surface water runoff rates from track surfaces.

### **Potential Effects**

#### *Potential Construction Effects*

##### Chemical Pollution

- 11.4.4 There is the potential for the accidental release of stored fuels, oils and materials (e.g. cement and grout) used on-site during construction works to negatively impact surface waters along and downstream of the Proposed Development and the underlying groundwater.
- 11.4.5 In the event of a chemical release, there is the potential for a negative impact to surface water resources and to shallow groundwater (if present) in near-surface peat and superficial deposits, with a subsequent impact on biodiversity. Potential effects include degradation of water quality, direct effects on aquatic ecology and indirect effects on the ecology of downstream receptors.
- 11.4.6 Surface waters are assessed to be of Medium sensitivity. Were an accidental release of potentially harmful materials to occur, such an event could be of a High magnitude. Therefore, there is the potential for a **major/moderate** impact to receiving waters.

##### Sedimentation and Increased Erosion Rates

- 11.4.7 There is the potential for the discharge of increased sediment loads due to construction activity and erosion to negatively impact on aquatic ecology or the fluvial morphology of receptors downstream of the Proposed Development. Increased sediment loads may be the result of excavation and surface disturbance, excavation and dewatering of foundation excavations or the mobilisation of stockpiled material.
- 11.4.8 Construction adjacent to watercourses may result in sediment being directly released into watercourses, or sediment may be mobilised via surface water runoff which could reach surface water receptors via overland flow or flow through any artificial drains. Surface water runoff with relatively high sediment loads may also be discharged over or into soil, which may in turn impact on local infiltration capacity or sensitive habitats.
- 11.4.9 There is the potential for hardstanding and compacted surfaces to increase rates of surface water runoff from the Proposed Development and for infrastructure to create preferential drainage pathways. Increases in surface runoff may in turn lead to higher risks of erosion and sedimentation, and also have the potential to increase flood risk downstream.
- 11.4.10 In the absence of mitigation, there could be a potential for a Medium magnitude of impact on watercourses, which are determined to be of Medium sensitivity, as a result of increased sediment load; this would be considered a potential moderate effect and therefore not significant effect.

##### Alteration to Surface Water Flows and Runoff

- 11.4.11 There is the potential for the Proposed Development to increase rates of runoff, leading to an increase in flood risk and indirect effects on aquatic ecology and fluvial morphology downstream of the Proposed Development. Areas of potentially reduced permeability include proposed hardstanding areas, tracks and areas of compacted hardcore.
- 11.4.12 In the absence of mitigation, there could be a potential for a High magnitude impact on watercourses, which are determined to be of Medium sensitivity, as a result of increased surface water runoff and flows; this would be considered a potential significant effect.

- 11.4.13 The construction of turbine foundations, hardstanding areas, construction compounds, and access tracks could lead to the restriction of surface water flows and near-surface flows downslope across the Proposed Development. This leads to the potential for a reduction in the water supply to down slope sensitive habitats and the risk of peat soils becoming dry or eventually desiccated due to a lowering of the water table and alterations to drainage patterns.
- 11.4.14 In the absence of mitigation, there could be a potential for a High magnitude of impact on sensitive habitats, determined to be of Low sensitivity (GWDTE habitats assessed as not being groundwater dependent but reliant on surface water runoff), as a result of increased sediment load; this would be considered a potential moderate effect and therefore not significant.

#### Alteration to Groundwater Flows

- 11.4.15 The installation of tower foundations and the presence of tracks could lead to alterations in groundwater flows.
- 11.4.16 Dewatering and temporary abstraction operations could lead to localised lowering in groundwater levels.
- 11.4.17 In the absence of mitigation, there could be a potential for a Medium magnitude impact on groundwater, which is determined to be of Low sensitivity, as a result of construction beneath the ground surface, dewatering and temporary abstractions; this would be considered a potential moderate/minor effect and therefore not significant.

#### Impacts due to Tree Felling and Forestry Operations

- 11.4.18 There is the potential, due to the felling and clearing of areas of forestry for diffuse pollution to affect surface waters. During the construction phase of the Proposed Development potential impacts are primarily nutrient input (phosphorus) to surface waters due to the disturbance of soils and the input of suspended solids due to soil disturbance associated with clear felling.
- 11.4.19 An assessment of the potential impact of felling associated with the Proposed Development is given in **Technical Appendix 11.4: Forestry Hydrology Assessment (EIAR Volume 4)**.
- 11.4.20 The Proposed Development would not exceed the 20% threshold of felling within the River Aray catchment, therefore the potential impact is considered of Low magnitude on a watercourse assessed to be of Medium sensitivity and therefore not significant.

#### Impacts on GWDTEs

- 11.4.21 An assessment of potential effects to, and loss of, GWDTE areas are provided in Chapter 8: Ecology (EIAR Volume 2) and Technical Appendix 11.2: Groundwater Dependent Terrestrial Ecosystem Assessment (EIAR Volume 4). There is the potential for alterations in the quality or quantity of groundwater supplies to areas identified as potentially groundwater dependent to lead to drying out or an alteration in water chemistry, and therefore the composition of vegetation communities.
- 11.4.22 The majority of the habitats within the Site are not considered groundwater dependent and are assessed as being of Low sensitivity. Therefore, in the absence of mitigation the sensitivity to alteration in groundwater supply is Low and the effect negligible and not significant.
- 11.4.23 The habitats are considered to be supported by surface water supplies. Therefore, in the absence of mitigation there is the potential for High magnitude impacts on the Low sensitivity habitats with respect to the rate and volume of surface water; this would be considered a moderate but not significant effect.

#### Impacts on PWSs

- 11.4.24 There is the potential for alteration in the quality e.g. through chemical pollution and sedimentation as detailed above, and / or quantity of surface water and groundwater supplies which could impact the quality and quantity of water to PWSs.
- 11.4.25 SEPA guidance<sup>9</sup> states PWSs within 250 m of excavations less than 1 m in depth, or 100 m of excavations greater than 1 m in depth require further assessment. Nine PWSs either fall within 250 m of the Proposed Development, or are in hydrological connectivity to the proposed works. Those supplies within 250 m of the Proposed Development are: North Tullich, Sallachry East, Stronmagachan, Three Bridges and High Balantyre (**Figure 11.3.2 in Technical Appendix 11.3: Private Water Supply Assessment (EIAR Volume 4)**). Potential effects have been considered further in **Technical Appendix 11.3: Private Water Supply Assessment (EIAR Volume 4)**.
- 11.4.26 In the absence of mitigation, there is the potential for a High magnitude impacts on PWS receptors of High sensitivity which would be considered a **major** and potential significant effect.

#### Impacts from Watercourse Crossings

- 11.4.27 Where proposed access tracks are required to cross a watercourse, there is a requirement for infrastructure to be within 50 m of watercourses, and work will directly impact the banks of the watercourse.
- 11.4.28 During the construction of watercourse crossings there is potential for activities to negatively impact both water quality and the natural morphology. SEPA's good practice guide (Engineering in the water environment: River crossings (Natural Scotland and SEPA, 2010<sup>10</sup>)) identifies that where proper care is not taken during the construction phase disturbance of river bed and banks can lead to the direct loss of aquatic flora and fauna, and the release of fine sediments and other pollutants that may lead to the smothering of plants and animals or the habitats they depend on.
- 11.4.29 All surface water features which proposed infrastructure crosses have been considered within a Watercourse Crossing Assessment (**Technical Appendix 11.1, EIAR Volume 4**). There are 60 crossings proposed, 17 of which are existing crossings.
- 11.4.30 In the absence of mitigation, there could be a potential for a High magnitude impact on watercourses, which are determined to be of Medium sensitivity, as a result of the new watercourse crossing; this would be considered **major/moderate** and a potential significant effect.

#### *Potential Operational Effects*

##### Chemical Pollution and Sedimentation

- 11.4.31 The potential risk of the release of pollutants or sediment from activities relating to the operational phase of the Proposed Development is substantially lower than during construction because of the decreased levels of ground disturbance. However, the operation or refuelling of plant machinery may take place within the Site during maintenance periods of the operational phase.
- 11.4.32 In the absence of mitigation, there could be a potential for a Medium magnitude impact on watercourses, which are determined to be of Medium sensitivity, as a result of increased sediment load from vehicle movements and potential refuelling incidents resulting in chemical release; this would be considered a potential moderate effect but not significant.

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<sup>9</sup> LUPS-GU31 SEPA 2017 Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems [https://www.sepa.org.uk/media/143868/lupsgu31\\_planning\\_guidance\\_on\\_groundwater\\_abstractions.pdf](https://www.sepa.org.uk/media/143868/lupsgu31_planning_guidance_on_groundwater_abstractions.pdf) [Accessed August 2022]

<sup>10</sup> SEPA. 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> [Accessed February 2022]

### Surface Water Flows and Runoff

- 11.4.33 There is the potential for hardstanding surfaces and compacted tracks and infrastructure to lead to increased rates of surface runoff, in turn leading to the potential for increased risk of surface erosion and downstream flood risk; however as described in **Chapter 2: Development Description (EIAR Volume 2)**, the Proposed Development will incorporate a drainage design using Sustainable Drainage Systems (SuDS) principles in accordance with The SuDS Manual (C753) 2015<sup>11</sup>.
- 11.4.34 In the absence of mitigation and appropriate drainage, there could be a potential for a Moderate magnitude impact on watercourses, which are determined to be of Medium sensitivity, as a result of increased sediment load; this would be considered **major/moderate** and a potential significant effect.

### Groundwater Flows

- 11.4.35 There is the potential for infrastructure installed to present a barrier to near surface and / or groundwater flows across the Proposed Development during the operational phase. Were cross drainage measures not appropriately installed, there is the potential for tracks to impede the movement of surface waters across blanket bog leading to the drying out or desiccation of areas dependent on water supply or retention.
- 11.4.36 In the absence of mitigation, there could be a potential for a High magnitude impact on sensitive habitats, which are determined to be of Low sensitivity, as a result of alterations to groundwater or near surface flows; this would be considered a potential moderate effect and therefore not significant.

## 11.5 Mitigation

- 11.5.1 The mitigation schedule set out below identifies measures that shall be implemented through the final Construction Environment Management Plan (CEMP) to be developed by the contractor, and detailed assessment of further measures that shall be implemented at hydrologically sensitive locations. An Outline CEMP has been provided in **Technical Appendix 2.2 (EIAR Volume 4)**.
- 11.5.2 The CEMP would include construction methods and environmental protection measures applying best practice guidance as set out in applicable SEPA PPGs, and applicable SSEN Transmission General Environmental Management Plans (GEMPs) presented in **Technical Appendix 2.3: SSEN Transmission General Environmental Management Plans (GEMP) (EIAR Volume 4)**. Implementation of these measures during all aspects of the construction phase would ensure construction activity would not cause adverse effects to sensitive receptors.
- 11.5.3 It is anticipated that the Proposed Development would be subject to a construction site licence (under the CAR regulations) and as such detailed design of proposed drainage works would be subject to licensing requirements set out under CAR and compliance with regulations would be agreed in consultation with the Argyll and Bute Council (APC) and SEPA and set out in the Construction Site License application.

### **Mitigation During Construction**

#### *Chemical Pollution*

- 11.5.4 The potential for impacts on the water environment through the release of pollutants during the construction phase would be managed through the implementation of a CEMP (as detailed in **Technical Appendix 2.2: Outline Construction Environmental Management Plan, EIAR Volume 4**). The CEMP would incorporate measures to ensure that the release of sediments or pollutants to the surrounding environment is avoided. These would be detailed in the Pollution Prevention Plan (PPP) to be developed by the contractor.

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<sup>11</sup> CIRIA. The SuDS Manual (C753) 2015. [https://www.susdrain.org/resources/SuDS\\_Manual.html](https://www.susdrain.org/resources/SuDS_Manual.html) [Accessed August 2022]

- 11.5.5 The storage of potentially contaminative materials (oils, cements/ grouts) shall be carried out at least 50 m from watercourses. Fuels, oils or chemicals stored on-site shall be sited over an impervious base and according with the CAR.

#### *Sedimentation and Erosion*

- 11.5.6 Sediment capture methods to be implemented would be detailed in the CEMP. Such measures shall ensure that sediment laden runoff from disturbed or excavated ground shall be directed to appropriate treatment trains. These would be detailed in the PPP to be developed by the contractor.
- 11.5.7 Where required, interceptor ditches shall divert waters to locations downstream of proposed excavation or soil disturbance works associated with the installation of tower foundations and the development of construction compounds. These would be specified in a PPP that would be compiled by the contractor in accordance with SEPA guidance<sup>12</sup>.

#### *Alteration to Surface Water Flows and Runoff*

- 11.5.8 Details of construction phase SuDS would be included in the PPP and the final CEMP, as required, to provide a surface water management and treatment train that would mitigate potential adverse impacts on the hydrology and surrounding areas during the construction phase of the Proposed Development. Measures would ensure that pre-development runoff rates are maintained and that rates of runoff to watercourses are not increased. A full SuDS solution would be developed prior to construction. Construction site plans and proposed drainage measures shall form a PPP that would be compiled by the contractor.
- 11.5.9 At the limited number of locations where a track is required to cross a watercourse, or where other infrastructure is necessary within 50 m of a surface watercourse, either as described in this Chapter or as identified by the Ecological Clerk of Works (ECoW), the installation of SuDS measures shall be supervised by the ECoW during the construction phase of works. The requirement for monitoring of water quality within watercourses downstream of the Proposed Development would be agreed with SEPA and Marine Scotland. Procedures for this would be detailed in the CEMP. Where applicable, prior to works baseline water quality monitoring shall be carried out (both upstream and downstream) and repeated during the construction works at agreed intervals.
- 11.5.10 Any requirement for surface water abstraction will be completed in accordance with the CAR.

#### *Alteration to Groundwater Flows*

- 11.5.11 The CEMP would include measures to minimise potential adverse effects related to surface water and groundwater discharge, including impacts associated with dewatering which may arise from the excavation of tower foundations. Therefore, the contractor shall be required to meet regulatory requirements and implement best practice measures as set out in SEPA planning guidance.
- 11.5.12 The requirement of groundwater monitoring would be detailed in the CEMP. This may include baseline groundwater quality monitoring which would be repeated during construction. Any requirement for groundwater water abstraction will be completed in accordance with the CAR.

#### *Tree Felling and Forestry Operations*

- 11.5.13 It is anticipated an OC will be required. The width of the OC within areas of commercial conifer forestry for a 275 kV OHL is 85 m, reduced to 60 m through sections of broadleaves. Good practice measures shall be

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<sup>12</sup> Supporting Guidance (WAT-SG-75), Sector Specific Guidance: Construction Sites February 2018, URL: <https://www.sepa.org.uk/media/340359/wat-sg-75.pdf> [Accessed February 2022]



implemented by the contractor responsible for felling operations in line with applicable General Binding Rules<sup>13</sup> and forestry industry good practice measures to protect the water environment<sup>14</sup>.

#### *GWDTEs*

- 11.5.14 Although the potential for habitats to be GWDTE is limited, prior to, and during, the construction phase of the Proposed Development under the advice of an onsite ECoW, the potential to micro-site infrastructure (within the agreed limits) to avoid sensitive habitats would be investigated. Location-specific detailed designs for tower foundations to avoid/minimise impacts on these habitats will also be investigated.
- 11.5.15 Although not GWDTE, it is considered that the maintenance of quality and quantity in surface water distribution across habitats will be important. Suitable drainage and surface water measures would be implemented, utilising SuDS where possible, to maintain hydrological connectivity in peatland and wetland habitats and prevent deleterious impacts on surface water distribution, which would be addressed in a CEMP for the site to be developed by the contractor.
- 11.5.16 The spring at OS NGR NN 08967 16797 is considered potentially groundwater dependent and is within 100 m of the Proposed Development. The Appointed Contractor will be responsible for undertaking further detailed site investigation and providing SEPA with a detailed risk assessment for any works near the spring. Additional mitigation may include demarcation of the spring and monitoring of works in close proximity by the ECoW.

#### *PWSs*

- 11.5.17 Detailed pre-construction PWS risk assessments will be completed by the contractor. This would entail confirming the locations of the PWS sources onsite, pre-construction monitoring of water quality and ensuring appropriate pollution prevention measures.
- 11.5.18 During construction water quality would be monitored. If the quality and/or quantity of water to the PWS is impacted by the Proposed Development, a temporary alternative water source would be supplied until remedial works are completed.
- 11.5.19 Water quality will be monitored immediately following construction to confirm the PWS is unaffected.

#### *Watercourse Crossings*

- 11.5.20 Construction shall be carried out in accordance with best SEPA practice<sup>15</sup> and SEPA Guidance for Pollution Prevention<sup>16</sup> to prevent direct siltation of watercourses.
- 11.5.21 The detailed design of each watercourse crossing would seek to ensure hydraulic conveyance is maintained to prevent any restriction of flows, as well as allowing the free passage of mammals and aquatic ecology. Therefore, it is proposed that each watercourse crossing would have sufficient capacity to pass the climate change-adjusted 1 in 200 year (0.5% AP) flood including an allowance for partial blockage.
- 11.5.22 To ensure that all drainage measures employed during the construction phase of the Proposed Development are maintained appropriately and remain effective, the performance of the drainage measures would be monitored. The drainage management works would, therefore, be supervised by the ECoW and be in accordance with the CEMP.

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<sup>13</sup> SEARS: Natural Scotland, undated. Reducing the Risk of water Pollution, Diffuse Pollution General Binding Rules (DP GBRs): Forestry. Available online: [https://www.sepa.org.uk/media/59566/dp\\_gbr\\_forestry.pdf](https://www.sepa.org.uk/media/59566/dp_gbr_forestry.pdf) [Accessed August 2022]

<sup>14</sup> Forestry Research, 2019. Practice Guide: Managing Forest Operations to Protect the Water Environment.

<sup>15</sup> SEPA, 2010. Engineering in the Water Environment: Good Practice Guide, River Crossings.

<sup>16</sup> SEPA 2018. Works and Maintenance in or Near water: GPP5

### Mitigation During Operation

- 11.5.23 A site maintenance programme would accord with any re-fuelling guidance (PPG 7<sup>17</sup>) with regard to site operations and would be implemented by the contractor.
- 11.5.24 A maintenance schedule would be developed for all SuDS and drainage assets installed at construction stage to ensure that the function and benefit provided by the asset remains for the lifetime of the Proposed Development.

## 11.6 Residual Effects

### Residual Construction Effects

#### *Chemical Pollution*

- 11.6.1 The potential for impacts on the water environment through the release of pollutants during the construction phase shall be managed through the implementation of a CEMP (as detailed in **Technical Appendix 2.1 OCEMP, EIAR Volume 4**). The CEMP shall incorporate measures to ensure that the release of pollutants to the surrounding environment is avoided and would ensure compliance with SEPA's PPGs/GPPs and General Binding Rules (GBRs). Measures such as the use of spill kits, placement of impermeable geotextile membranes and the suitable storage, maintenance and handling of equipment and materials would effectively limit the release of contaminants to the water environment and the associated potential significant effects.
- 11.6.2 Through the implementation of mitigation, the potential impacts on surface waters, GWDTEs and groundwater (receptors of Medium sensitivity) with respect to chemical pollution are anticipated to result in a negligible/ none effect and therefore not significant.

#### *Sedimentation and Increased Erosion*

- 11.6.3 The potential for adverse impact on water quality and fluvial morphology associated with sediment-laden runoff or impacts on bank integrity would be taken into account in the design of the Proposed Development and the maintenance of a suitable buffer to watercourses.
- 11.6.4 Furthermore, SuDS design would ensure the capture of any additional sediment load that could be released during the construction phase. Where access tracks are proposed within the 50 m of watercourses, the implementation of additional sediment control measures would be overseen by the ECoW, who would also carry out daily inspection of sediment control measures and the watercourse.
- 11.6.5 Therefore, with the implementation of mitigation, the impact on surface waters considered to be of Medium sensitivity is none / negligible and there would be no significant residual effects.

#### *Alteration to Surface Water Flows and Runoff*

- 11.6.6 The potential for adverse impact on runoff volumes and rates through the increase in impermeable surfaces and the alteration of drainage patterns shall be mitigated through the implementation of best practice measures as outlined above and set out in the CEMP. Therefore, the impact on surface waters of Medium sensitivity would result in a negligible / none and therefore not significant effect.

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<sup>17</sup> SEPA Pollution Prevention Guidelines: The safe operation of refuelling facilities: PPG 7. July 2011. [https://www.sepa.org.uk/media/145003/ppg-7\\_the\\_safe\\_operation\\_of\\_refuelling\\_facilities.pdf](https://www.sepa.org.uk/media/145003/ppg-7_the_safe_operation_of_refuelling_facilities.pdf) [Accessed August 2022]

#### *Alteration to Groundwater Flows*

- 11.6.7 Through implementation of the CEMP the impact to groundwaters of Low sensitivity would be negligible/ none and therefore not significant.

#### *GWDEs*

- 11.6.8 Through the implementation of the CEMP to maintain water quality and quantity to sensitive habitats not considered groundwater dependent, the impact to the habitats of Low sensitivity would be Negligible and therefore not significant.
- 11.6.9 As set out previously, the Appointed Contractor will be responsible for undertaking further detailed site investigation and providing SEPA with a detailed risk assessment for any works near the spring such that, it is considered the residual effect on the habitats at the spring would be of a Low magnitude to the High sensitivity spring (where a contribution from groundwater cannot be discounted) such that the overall effect would be of Moderate significance and therefore not significant.

#### *Impacts due to Tree Felling and Forestry Operations*

- 11.6.10 An assessment of the potential impact of felling associated with the Proposed Development is given in **Technical Appendix 11.4: Forestry Hydrology Assessment (EIAR Volume 4)**. The assessment concluded as <1% of the River Aray catchment will be felled, the residual effect on water resources of Medium sensitivity would be negligible / none and therefore not significant.

#### *PWSs*

- 11.6.11 PWSs are considered to be of High sensitivity. With implementation of mitigation the residual effect on PWSs are anticipated to be negligible and therefore not significant.

#### *Watercourse Crossings*

- 11.6.12 The design of watercourse crossings and drainage features associated with infrastructure would be in line with CAR regulations and set out in a Construction Site License in consultation with SEPA and the Local Authority.
- 11.6.13 Adherence to specific guidance related to watercourse crossings, referenced in **Technical Appendix 11.1: Watercourse Crossing Assessment (EIAR Volume 4)**, and implementation of the CEMP are anticipated to result in negligible / non- residual impacts on surface water receptors of Medium sensitivity with respect to sedimentation, erosion and alterations to flows as a result of crossings. No significant residual effects are anticipated.

#### **Residual Operational Effects**

- 11.6.14 Following appropriate design and construction and provided suitable maintenance schedules are developed and are adhered to, residual adverse effects on surface water, groundwater, GWDE and PWS receptors during the operational phase would be not significant.

## **11.7 Cumulative Effects**

- 11.7.1 Cumulative schemes within 15 km of the Proposed Development are shown in **Figure 15.1: Cumulative Developments (EIAR Volume 3a)**.
- 11.7.2 Developments within the River Aray catchment, and therefore hydrological connectivity to the Proposed Development, comprise:
- Creag Dhubh substation;

- The southernmost extent of the Creag Dhubh to Dalmally 275 kV OHL;
- ITE/ITW Connection to Creag Dhubh substation from the existing 132 kV Taynuilt to Inveraray OHL;
- Access tracks to the Blarghour Wind Farm;
- The eastern extent of the Carr Duibh Wind Farm; and
- Ladyfield Wind Farm.

- 11.7.3 There is the potential for cumulative and in-combination hydrological effects on the River Aray and its tributaries with the above developments if construction were to take place at the same time as the Proposed Development. However, the EIA Reports for Creag Dhubh to Dalmally 275 kV OHL and Blarghour Wind Farms, and Environmental Assessment for the Creag Dhubh substation, concluded there would be no significant residual impacts to the water environment with the application of mitigation. Therefore, it is considered that the addition of the Proposed Development (with not significant effects) would not give rise to significant cumulative effects when considered in combination with those developments.
- 11.7.4 The Ladyfield and Carr Duibh Wind Farms are at Scoping stage, but it is reasonable to assume that these developments would also incorporate good practice drainage management measures and mitigation into their respective designs such that effects on the water environment would be negligible. Therefore, it is considered the Proposed Development would not give rise to significant cumulative effects.
- 11.7.5 There is potential for forestry operations to affect water quality in watercourses and downstream receptors. Ramboll have prepared a Forestry Hydrology Assessment (**Technical Appendix 11.4, EIAR Volume 4**), this demonstrates that for the river catchments within which felling is proposed for the Proposed Development, clearance of the proposed OC and associated access infrastructure, combined with plans for commercial felling shall be within UK Forestry Standards Guidelines (UKFSG) (5<sup>th</sup> edition)<sup>18</sup>. UKFSG state that *“effects of harvesting on surface water acidity are difficult to discern when 20% or less of a catchment is felled within any three-year period”*.
- 11.7.6 The total potential for felling associated with the Proposed Development amounts to less than 20% of the River Aray catchment. The access route to the Blarghour Wind Farm falls within the River Aray catchment and will require felling (it also falls within the Phase 3: 2025-2029 felling phase<sup>19</sup> of the LTFP) but this is unlikely to amount to more than 20% of the catchment in combination with the Proposed Development. No significant cumulative impact is therefore anticipated.
- 11.7.7 Ladyfield Wind Farm is likely to require felling associated with the wind farm infrastructure, as well as felling within commercial woodland and long term forestry felling plan areas. However, the quantum of felling is not known at this stage and would be subject to a requirement for felling licence approval from Scottish Forestry such that impacts on the River Aray would be avoided.

## 11.8 Monitoring

### Construction Phase Monitoring

- 11.8.1 Five PWSs are located within 250 m of, and a further four are in hydrological connectivity to the Proposed Development. A programme of water quality monitoring at PWSs within hydrological connectivity of the Proposed Development (**Technical Appendix 11.3: Private Water Supply Assessment**) would be implemented prior to the initiation of construction activity such that a baseline of water quality may be

<sup>18</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/687147/The\\_UK\\_Forestry\\_Standard.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/687147/The_UK_Forestry_Standard.pdf) [Accessed August 2022]

<sup>19</sup> Figure 2.13: Forestry Felling Plan of the Blarghour Wind Farm EIAR. ECU Reference EC00005267. <https://www.energyconsents.scot/ApplicationDetails.aspx?cr=EC00005267> [Accessed August 2022]

established, regular monitoring should be carried out during the construction phase, and final period of monitoring post construction.

11.8.2 There are areas of sensitive GWDTE habitats which are within 100 m of the Proposed Development. As per SEPA LUP-GU31 guidance monitoring of these habitats and groundwater flows in these areas may be required.

11.8.3 The location and frequency of water quality monitoring shall be agreed with SEPA and water quality monitoring shall be supervised by the ECoW.

### Operation Phase Monitoring

11.8.4 The Appointed Contractor would be responsible for implementing a site maintenance programme which would accord with re-fuelling guidance (PPG 7), reducing the potential for chemical impacts to local hydrology. It is therefore considered there is minimal potential for impacts to PWSs during the operational phase and no ongoing monitoring is considered necessary.

## 11.9 Summary

11.9.1 **Table 11-7** provides a summary of the potential likely significant effects considered, proposed mitigation and commitments and the likely residual effects.

**Table 11-7: Summary of Sensitive Receptors**

Likely Effect	Significant	Mitigation Proposed	Means of Implementation	Outcome/Residual Effect
<b>Construction</b>				
Chemical Pollution Major (significant) potential impact on surface waters and groundwaters due to release of chemical pollutants.		Storage, containment and operational best practice shall be implemented. Suitable emergency spill or leak response kits and procedures shall be in place.	Detailed through the CEMP and associated PPP.  Detailed specification shall be submitted to SEPA with regards to the application for a Construction Site License by the contractor.	Not Significant
Sedimentation Major (significant) potential impact on surface waters on and downstream of the Proposed Development, due to effects on water quality due to increased sediment loads.		Implementation of 50 m buffers to watercourses.  Implementation of best practice with regards to construction methods in close proximity to watercourses. To include diversion ditches around excavation works.  Implementation of best practice with regards to construction of watercourse crossings.  Baseline and subsequent water quality monitoring.	Detailed through the CEMP and associated PPP.  Monitoring of works by the ECoW, inspection of watercourses during the construction phase.	Not Significant
Surface Water Flows Major (significant) potential impact on surface waters beneath and		Drainage management proposals to ensure pre-construction rates/ volumes of runoff maintained.	Detailed drainage calculations to be submitted by the contractor to quantify potential increases in surface runoff and define operational	Not Significant

Likely Significant Effect	Mitigation Proposed	Means of Implementation	Outcome/Residual Effect
downstream of the Proposed Development, due to hardstanding and compacted surfaces leading to increased rates of surface runoff on the area of the Proposed Development and for infrastructure to create preferential drainage pathways.	The drainage management works will be supervised by the ECoW.	parameters for SuDS measures.	
Groundwater Flows Moderate (significant) effects on groundwater, associated with chemical pollution, alteration of sub-surface flows and lowering groundwater table.	The contractor shall be required to meet regulatory requirements and implement best practice measures as set out in SEPA planning guidance.	Detailed through the CEMP. Any requirement for groundwater water abstraction will be completed in accordance with the CAR.	Not significant.
Impact to GWDTEs Major (significant) potential impact on GWDTEs due to restriction of surface water flows and near-surface flows downslope across the Proposed Development. This leads to the potential for a reduction in the water supply to downslope GWDTE habitats. In addition, major (significant) potential impacts to groundwater flows supporting the spring.	Prior to and during the construction phase of the proposed development under the advice of an onsite ECoW, the potential to micro-site infrastructure will be investigated.  Maintenance of 'clean' water flows around construction locations and into surface water reliant habitats.  Suitable distribution of surface waters from SuDS measures.  Potential monitoring of groundwater flows at the spring, demarcation of the spring and works to be overseen by the ECoW.	Detailed through the CEMP and associated PPP.  Monitoring of works by the ECoW.  Pre-construction detailed risk assessment at the spring to be carried out by the contractor.	Not significant
Impacts to PWSs Major (significant) potential impact on PWSs due to alteration in water quantity and / or quality.	Details pre-construction surveys to be completed by the Contractor.  Water quality monitoring during construction and an alternative supply provided if the PWS is impacted until	Detailed through the CEMP.	Not significant

Likely Effect	Significant	Mitigation Proposed	Means of Implementation	Outcome/Residual Effect
		remedial works are completed.		
<b>Operation</b>				
None / minor (non-significant) effects associated with chemical pollution; sedimentation; alteration to runoff volumes and rates and fluvial morphology through the alteration of drainage patterns		<p>None required.</p> <p>Ongoing maintenance for all proposed drainage measures particularly including water crossings and SuDs designed to manage water quality and runoff rate.</p> <p>Maintenance schedule for site operation to follow good practice for managing hazardous chemicals and adhere with PPG7.</p>	Relevant legislation and good practice measures for site operation to be followed.	Not significant
No impact (non-significant) for <b>GWDTE</b> during operation further to those identified for the construction phase.		None required.	N/A	Not significant
No impact (non-significant) for PWSs during operation further to those identified for the construction phase.		None required.	N/A	Not significant
<b>Cumulative Construction</b>				
Potential (non-significant) cumulative impacts to water quality and quantity to the River Aray as a result of other proposed developments within the River Aray catchment.		No additional mitigation over and above that set out above.	CEMP and PPP.	Not significant
Potential (non-significant) cumulative impacts to the River Aray water quality as a result of forestry felling within the River Aray catchment.		None required Felling would be subject to a requirement for felling licence approval from Scottish Forestry such that impacts on the River Aray would be avoided.	N/A	Not significant



Likely Effect	Significant	Mitigation Proposed	Means of Implementation	Outcome/Residual Effect
<b>Cumulative Operation</b>				
No cumulative effects are anticipated.		None required.	N/A	Not significant