Scottish & Southern Electricity Networks
TRANSMISSION

VOLUME 2: CHAPTER 10 – WATER ENVIRONMENT

Figures (Volume 3 of this EIA Report)

Appendices (Volume 5 of this EIA Report)

10. WATER ENVIRONMENT

10.1 Executive Summary

10.1.1 This chapter describes the assessment of potential effects of the Proposed Development on the water environment. This chapter presents the baseline environment, identifies and assesses effects on receptors, reports any potential significant effects and, where appropriate, sets out proposed mitigation.

10.1.2 Information for the Study Area was compiled using baseline information from a desk study which was verified by an extensive programme of field work. The field work included taking note of hydrological characteristics of watercourses and waterbodies, 'ground truthing' the desk-based study and investigating private and public water supply sources in order to determine those which could potentially be hydrologically connected to, and potentially at risk from, the Proposed Development.

10.1.3 The assessment includes designated sites and where these are water dependent and have a potential hydrologic connection to the Proposed Development these have been considered in the assessment.

10.1.4 The assessment was undertaken considering the sensitivity of receptors identified during the baseline study and considering mitigation measures embedded in the design of the Proposed Development. It has also considered potential future changes to baseline conditions.

10.1.5 The scope of the assessment was informed by scoping responses received from statutory and non-statutory consultees and the Scoping Opinion received from Scottish Ministers. Further consultation was undertaken with Scottish Water, the Highland Council (THC) and residents who benefit from a private water supply (PWS) to enable a thorough assessment of the potential effects of the Proposed Development on public and private water supply sources.

10.1.6 The assessment is supported by appendices that consider potential effects on Drinking Water Protected Areas and private water supplies, and on habitats which could be sustained by groundwater (Groundwater Dependent Terrestrial Ecosystems). A schedule of proposed watercourse crossings associated with the Proposed Development is also provided as an appendix.

10.1.7 The Proposed Development design has implemented the Scottish Environmental Protection Agency's (SEPA's) recommended riparian corridor when considering buffers for water features. There are limited locations where, as a consequence of engineering constraints, it has not been possible to maintain watercourse buffers and these locations are identified in this assessment. It is recognised that at these locations additional safeguards are required to protect the water environment and details of these are identified in this assessment.

10.1.8 Subject to adoption of best practice construction techniques and mitigation informed by the General Environmental Management Plans (GEMP) set out in paragraph 10.3.25, and a project specific detailed Construction Environmental Management Plan (CEMP), no significant adverse effects on the water environment have been identified. The CEMP will include provision for drainage management plans which will be agreed with statutory consultees, including SEPA and which will be used to safeguard water resources and manage flood risk. The Proposed Development includes the use of Sustainable Drainage Systems. The CEMP will also include provision of a Pollution Prevention Plan which would also be agreed with statutory consultees including SEPA prior to any construction or dismantling works being undertaken.

10.1.9 Notwithstanding these safeguards, a programme of baseline and construction phase water quality monitoring is proposed which would be used to ensure that, as construction works progress, the Proposed Development would not have a significant effect on the water environment. The monitoring programme would also be used to ensure private water supplies, drinking water protected areas, and water dependent designated sites are

safeguarded. It is proposed that the frequency and methodology of the monitoring programme is agreed with statutory consultees.

10.2 Introduction

10.2.1 This chapter assesses the potential effects of the Proposed Development on the water environment. It describes the embedded good practice methods which are included in the design to prevent or reduce identified effects.

10.2.2 Mitigation methods to address any potential effects are proposed, where appropriate, and residual effects are then assessed to identify any potential significant effects.

10.2.3 Additional detail supporting this chapter is presented in the following figures and chapters within this EIA Report:

- **Volume 3, Figure 10.1: Water Environment Study Area;**
- **Volume 3, Figure 10.2: Surface Watercourses and Waterbodies;**
- **Volume 3, Figure 10.3: Surface Water Catchments;**
- **Volume 3, Figure 10.4: Groundwater Classifications;**
- **Volume 3, Figure 10.5: BGS 625,000 Scale Hydrogeology;**
- **Volume 3, Figure 10.6: Private Water Supplies (Confidential);**
- **Volume 3, Figure 10.7: Groundwater Dependent Terrestrial Ecosystems;**
- **Volume 3, Figure 10.8: Drinking Water Catchments and Abstractions;**
- **Volume 3, Figure 10.9: Designated Sites;**
- **Volume 3, Figure 10.10: SEPA Flood Map Flood Zones;**
- **Volume 3, Figure 10.11: Watercourse Crossing Locations;**
- **Volume 3, Figure 10.12: Groundwater Dependent Terrestrial Ecosystems Based On Hydrological Assessment;**
- **Volume 2, Chapter 8: Ecology and Nature Conservation;**
- **Volume 2, Chapter 11: Geological Environment;**
- **Volume 2, Chapter 17: Cumulative Assessment;**
- **Volume 2, Chapter 19: Schedule of Mitigation;**
- **Volume 5, Appendix 10.1: Schedule of Watercourse Crossings;**
- **Volume 5, Appendix 10.2: Drinking Water Protected Areas and Private Water Supplies Risk Assessment (Confidential);**
- **Volume 5, Appendix 10.3: Groundwater Dependent Terrestrial Ecosystem Assessment;**
- **Volume 5, Appendix 10.4: Site Water Management and Pollution Prevention Plan;**
- **Volume 5, Appendix 3.3: General Environmental Management Plans; and**
- **Volume 5, Appendix 8.10: World Heritage Site (WHS) Appraisal.**

10.3 Scope of Assessment and Methodology

10.3.1 This chapter focuses on the potential effects of the Proposed Development on water environment receptors within the Study Area. It is expected that effects associated with the operational phase are similar to, and of lower magnitude than, those identified within the construction phase.

Study Area

10.3.2 The Proposed Development extends for approximately 173 km from the proposed new Banniskirk Substation in Spittal, in the far north of the Scottish Highlands, to the proposed new Carnaig Substation west of Dornoch, and finally to the proposed new Fanellan Substation near to Beauly, west of Inverness in the Scottish Highlands. The Proposed Alignment has been split into five sections to more easily describe the local baseline conditions, and constraints. These sections are defined in **Chapter 3: Description of the Proposed Development**.

10.3.3 The Study Area for this chapter is shown on the interactive web map[1] and **Volume 3, Figure 10.1**. It is based on the identification of surface water and groundwater features within 1 km of the Proposed Development. The Study Area has been selected based on professional judgement and experience on projects similar in nature and geography. It is anticipated hydrological effects are significantly reduced at distances greater than 1 km as any contaminant, sediment or impediment to flow would disperse and reduce in concentration as it passes through the wider catchment. Where necessary, the Study Area has been extended to include specific features that could be affected by the Proposed Development.

Consultation and Scoping

10.3.4 **Table 10.1** summarises consultation responses received at EIA Scoping stage and, consistent with paragraphs 2.3 and 5.6 of the Scoping Opinion, explains below in tabular form how these have been addressed within the assessment. Further information regarding the consultation process and responses received at earlier stages of the project is provided in **Chapter 6: Scope and Consultation**.

Table 10.1: Water Environment Consultation Responses

Consultee	Consultation Type	Response	How the Response is Addressed
SEPA	Scoping response	**Water Environment:** **1**: The proposals should demonstrate how impacts on local hydrology have been minimised and the site layout is designed to minimise watercourse crossings and avoid other direct impacts on water features. Measures should be put in place to protect any downstream sensitive receptors. **2:** The submission must include a set of drawings showing: a) All proposed temporary or permanent infrastructure overlain with all lochs and watercourses; b) A suitable minimum buffer around each loch or watercourse must be implemented following SEPA Recommended Riparian Corridor maps[2]. **3:** Follow SEPA watercourse crossing good practice guide[3].	**Water Environment:** **1:** Embedded mitigation which demonstrates how impact on local hydrology has been minimised is shown in **Table 10.5** and assessment of this is summarised in **Table 10.38**. Site layout has been designed to avoid as many impacts to all receptors as possible, this is described in further detail in **Chapter 3: Description of the Proposed Development**. **2:** a) How the Proposed Development interacts with the Water Environment is shown in **Volume 3, Figure 10.2**. b) All buffers have been changed from 50 m to the SEPA recommended riparian corridor for specific watercourses. This buffer is illustrated in **Volume 3, Figure 10.2**.

[1] ERM (2024) Spittal to Loch Buidhe to Beauly OHL Connection: Interactive web map. Available online at: https://storymaps.arcgis.com/stories/364d4f42d26f408c85530363cb9bf53b

[2] Scotland Environment (2024) SEPA recommended riparian corridor map. Available online https://map.environment.gov.scot/sewebmap/?layers=recommendedRiparianCorridor

[3] SEPA (2010) Engineering in the water environment: good practice guide: River crossings. Available online https://www.sepa.org.uk/media/151036/wat-sg-25.pdf

Consultee	Consultation Type	Response	How the Response is Addressed
		Flood Risk: **1:** Crossings must be designed to accommodate the 0.5% annual exceedance probability flows (with an appropriate allowance for climate change), or information provided to justify smaller structures. **2:** If the Proposed Development is shown to increase flood risk to a nearby receptor then a Flood Risk Assessment must be submitted. **Groundwater Dependent Terrestrial Ecosystems (GWDTEs) and existing groundwater abstractions:** **1:** A National Vegetation Classification (NVC) survey should be submitted which includes the following information: a) A set of drawings demonstrating all GWDTE and existing groundwater abstractions are out with a 100 m radius of all excavations shallower than 1 m and out with 250 m of all excavations deeper than 1 m and proposed groundwater abstractions. The survey needs to extend beyond the site boundary where the distances require it. b) If the minimum buffers cannot be achieved, a detailed site specific qualitative and/or quantitative risk assessment will be required. Guidance on Assessing the Impacts of Development Proposals on GWDTEs[4] must be referred to. **Impacts on Water quality:** **1:** If forestry is present on the site, the site layout should be designed to avoid large scale felling, as this can result in large amounts of waste material and a peak in release of nutrients which can affect local water quality. The submission must include drawings with the boundaries of where felling will take place and a description of what is proposed for this timber in accordance with SEPA, SNH and FCS guidance[5]. **2:** The submission must include a schedule of mitigation, which includes reference to best practice pollution prevention and	**3:** A watercourse crossing schedule has been compiled and is available in **Volume 5**, **Appendix 10.1 Schedule of Watercourse Crossings** which identifies the location and type of watercourse crossings, the nature of the watercourse being crossed and the applicable mitigation in place to protect downstream receptors. The interactive web map highlights places where watercourse crossings occur as well as showing the updated buffer. SSEN's Watercourse Crossing GEMP will also be adhered to as shown in **Volume 5**, **Appendix 3.3 GEMPs.** **Flood Risk:** **1:** All watercourse crossings will accommodate the 0.5% annual exceedance probability (plus climate change) flows by following SEPA watercourse crossing good practice guide and SSEN's Watercourse Crossing GEMP. This is described further in **Volume 5**, **Appendix 10.1.** The implementation of the watercourse crossings in accordance with SEPA guidance will reduce the potential for downstream increases in flood risk and increases in flood risk elsewhere. **2:** As shown in **Table 10.38** increases to flood risk to nearby receptors is shown to be **negligible** and **not significant.** **GWDTEs and existing groundwater abstractions:** **1:** An NVC survey has been completed which includes potential groundwater dependency categories for habitats. a) GWDTEs across the Proposed Development are shown in **Volume 3,** Figure **10.7**. b) A detailed site specific risk has been constructed following SEPA guidance and is shown in **Volume 5**, **Appendix 10.3: GWDTE Assessment.** This identifies the groundwater dependency of each habitat and includes

[4] SEPA (2017) Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Available online https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions.pdf

[5] SEPA (2014) Use of Trees Cleared to Facilitate Development on Afforested Land – Joint Guidance. https://www.sepa.org.uk/media/143799/use_of_trees_cleared_to_facilitate_development_on_afforested_land_sepa_snh_fcs_guidance-_april_2014.pdf

Consultee	Consultation Type	Response	How the Response is Addressed
		construction techniques and regulatory requirements. Please refer to the Guidance for Pollution Prevention (GPPs)[6].	appropriate buffers and mitigation in accordance with SEPA guidance. SSEN's Working in Peatland and Sensitive Habitats GEMP was also used to mitigate the potential impact magnitude. **Impacts on Water quality:** **1:** Impacts relating to forestry and felling are assessed in **Chapter 13: Forestry.** How felling is featured across the Proposed Development is shown in **Volume 5, Appendix 13.1: Woodland Reports.** **2:** A CEMP along with a series of SSEN GEMPs will be adhered to, to ensure that impacts on water quality are mitigated from all sources. GEMPs relevant to water quality impacts are the: • Bad Weather GEMP, • Soil Management GEMP, • Dust Management GEMP, and • Working in or near Water GEMP. Full details of these can be found in **Volume 5**, **Appendix 3.3: GEMPs**.
Energy Consents Unit (ECU)	Scoping Opinion	A request has been made to identify all Scottish Water Assets as well as identifying private water supplies which may be impacted by the development. If any assets or supplies are identified, potential impacts, risks, and mitigation should be provided. There should also be an identification of main watercourses and waterbodies.	Scottish Water have been contacted which supplied the location of public drinking water supplies as highlighted throughout the baseline. Potential impacts, risks, and mitigation has been highlighted in **Volume 5, Appendix 10.2.** An identification of private water supplies has been conducted which has sent questionnaires out to local residents as well as making use of The Highland Council open source data on known private water supplies, these are highlighted throughout the baseline section. Potential impacts, risks, and mitigation has been highlighted in **Volume 5, Appendix 10.2.** All main watercourses and waterbodies have been identified throughout the baseline section.
The Highland Council (THC)	Scoping Response	**1:** The EIA must address potential impacts on watercourses, water supplies including private supplies, water quality, water	**1:** The baseline of the Proposed Development is covered in **Section 10.4** and assessment of effects of the Proposed Development on the baseline

[6] SEPA (various). Available online at: https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/.

Consultee	Consultation Type	Response	How the Response is Addressed
		quantity, groundwater quality, other water features and sensitive receptors. **2:** Measures to prevent erosion, sedimentation or discolouration will be required, along with monitoring proposals and contingency plans. **3:** Assessment will need to recognise periods of high rainfall which will impact on any calculations of run-off, high flow in watercourses and hydrogeological matters. **4:** Advised to consult SEPA as the regulatory body responsible for the implementation of the Controlled Activities (Scotland) Regulations 2005 (CAR), to identify license requirements and the extent of the information required by SEPA. **5:** If culverting should be proposed, then it should be noted that SEPA has a general presumption against modification, diversion or culverting of watercourses. Schemes should be designed to avoid crossing watercourses, and to bridge watercourses where this cannot be avoided. **6:** EIAR must have a watercourse crossing schedule which should be accompanied by photography of each watercourse affected and include dimensions of the watercourse. Suggested use of decision tree for crossing style, considering factors including catchment size (resultant flows), natural habitat and environmental concerns. Further guidance on the design and implementation of crossings can be found on SEPA's Construction of River Crossings Good Practice Guide. **7:** The applicant will be required to carry out an investigation to identify any private water supplies, including pipework, which may be adversely affected by the development and to submit details of the measures proposed to prevent contamination or physical disruption. Highland Council has some information on known supplies, but it is not definitive. An on site survey will be required. It is noted that the applicant intends to undertake consultation with supply owners and site visits where required.	conditions is highlighted in **Section 10.5.** **2:** Embedded mitigation to prevent erosion and sedimentation or discolouration is shown in **Table 10.5** which features details of monitoring proposals and contingency plans. **3:** Measures to safeguard the water environment from construction including working in high rainfall conditions is set out in the embedded mitigations in **Section 10.3** and **Volume 5**, **Appendix 3.3.** **4:** SEPA have been consulted throughout the process as shown in this table. **5:** Site layout has been designed to avoid as many impacts to all receptors as possible, this is described in further detail in **Chapter 3: Description of the Proposed Development** and where this was not possible the crossing has been designed in accordance with SEPA watercourse crossing good practice guidance. **6:** A watercourse crossing schedule has been produced as shown in **Volume 5**, **Appendix 10.1** which features the details for every proposed watercourse crossing. Where CAR license is required, this has been identified. **7:** A standalone PWS risk assessment is provided in **Volume 5, Appendix 10.2**, which outlines how PWS details have been obtained from site surveys and questionnaires issued to landowners.
Ardgay and District	Scoping Response	The response from the community council was limited to details that were presented in scoping.	**1:** The baseline and assessment of impacts on the water environment is

Consultee	Consultation Type	Response	How the Response is Addressed
Community Council		**1:** The community council highlighted that proper assessment should be undertaken when route alignment and siting of the individual towers have been determined. **2:** The amount of PWS identified in the area the community council are concerned about was significantly smaller than expected, therefore, they would like further investigation of why this is the case. **3:** The scoping report states, "Hydrological connectivity to sites designated for nature conservation is not expected to exceed 2 km, as such designated sites beyond this threshold are scoped out of the assessment." A&DCC disagree with the premise of this statement when one considers the cumulative impact and as stated in the Report. The ecological impacts of development sites should be assessed on a whole catchment, from source to outfall and beyond, survey.	included throughout this chapter using the final route alignment. **2:** The scoping was submitted before questionnaires had been returned so the PWS identified are based on publicly available information from THC. A PWS risk assessment has been conducted which features mitigation measures and is available in **Volume 5**, **Appendix 10.2.** **3:** Hydrological connectivity distance to protected sites has been identified by hydrological specialists in this chapter at 1 km. A precautionary approach has been applied extending this distance to 2 km. SEPA LUPS Guidance Note 31[25] has been used in respect to groundwater, to determine impacts up to 250 m from ecological features, this is further detailed within **Volume 5, Appendix 10.3.**
Kyle of Sutherland District Salmon Fishery Board	Scoping Response	**1:** The board have requested that hydrology data, including for any artificial drainage watercourses is included in the EIA. Any artificial or modified drainage channels need to be fully mapped as part of the assessment process. **2:** The board have also requested water quality data (i.e. turbidity, pH, dissolved organic carbon, acid-neutralising capacity etc.) is included for all potentially affected watercourses.	**1:** Details on surface water hydrology are provided throughout **Section 10.4** How surface water interacts with the Proposed Development is illustrated in **Volume 3, Figure 10.2.** **2:** Where appropriate, water quality monitoring will be completed as per embedded mitigation in **Table 10.5.**
NatureScot	Scoping Response	**1:** NatureScot identified that SSSI, SPA, SAC, Ramsar, and WHS were at risk from the Proposed Development when considering the water environment. This included Caithness and Sutherland Peatlands SPA, SAC, Ramsar. **2:** NatureScot also requested that the WHS toolkit is completed for The Flow Country WHS.	**1:** Assessment of effects and mitigation relating to designated sites and receptors are detailed in **Section 10.5**. Assessment of effects and mitigation of the Caithness and Sutherland Peatlands is discussed in **Chapter 11: Geological Environment**. **2:** The WHS toolkit has been completed and is provided in **Volume 5, Appendix 8.10: WHS appraisal**.
Contin, Strathpeffer, Marybank, Scatwell and Strathconon Community Councils	Scoping Response	**1:** This community council have indicated that conversations with residents have suggested that not all private water supplies have been identified by the approach used. **2:** Consideration needs to be given to the risk of damage to towers as a result of large debris carried by flood waters, e.g. trees	**1:** The scoping report was submitted before questionnaires had been returned, so the PWS identified at the scoping stage were based on publicly available information from THC. A PWS risk assessment has been conducted which features PWS identified via questionnaires and mitigation

Consultee	Consultation Type	Response	How the Response is Addressed
		3: The community council have also noted that the nature of mitigation activities that sometimes they fail. The movement of groundwater in fractured rocks is unpredictable and possibly fast. The community council have recommended that potentially hazardous activities are not undertaken in likely drinking water supply catchments, nor the catchments to stream headwaters. **4:** The use of the Sichardt equation is not supported by the hydrogeological profession and it is not found in standard hydrogeology texts.	measures, and is available in **Volume 5, Appendix 10.2.** **2:** Where feasible towers are located outwith SEPA flood zones. Watercourse buffers in accordance with the SEPA Riparian Corridor buffers have been implemented which will offset towers from watercourses, providing which reduces the risk posed from flood water debris. In instances where design and engineering constraints require infrastructure within these buffers additional mitigation has been proposed. **3:** Embedded mitigation in the form of GEMPs produced by SSEN as shown in **Volume 5**, **Appendix 3.3** and inputted into this chapter in **Section 10.3** will be adhered to and enforced by a CEMP produced by the Principal Contractors. The Scottish Water List of Precautions for Assets are detailed in **Volume 5**, **Appendix 10.2: DWPA and PWS Risk Assessment** and will be implemented as part of the mitigation measures, which account for managing potential impacts in drinking water supply catchments. Furthermore, Scottish Water have been consulted as part of the EIA. **4:** Potential impacts to groundwater receptors have been assessed using 100 m to 250 m buffers in accordance with SEPA Land Use Planning Guidance Note 31. The Sichardt equation will no longer be used, as SEPA's Land Use Planning Guidance Note 31 specifically sets out the recommended approach for setting buffers around groundwater receptors. Therefore, SEPA guidance has been chosen as the method to calculate potential impacts on GWDTE.

Potential Impacts Assessed in Full

10.3.5 In the absence of mitigation measures there is the potential for the following impacts on the water environment during the construction of the Proposed Development:

- Impediments to near-surface water and drainage to all watercourses as a result of construction;
- Chemical pollution, acidification and sedimentation of the water environment from general construction activities (spillage);
- Changes to the hydrological function of GWDTEs;

- Changes to groundwater interflow patterns from temporary works such as physical cut-offs or dewatering for foundations, affecting the hydrologically connected groundwater bodies and leading to reduced function of or severance of flow to groundwater supplies and GWDTEs;
- Reduced quality, quantity or continuity of supply for Drinking Water Protected Areas (DWPAs) or private water supplies due to changes in groundwater, near-surface or surface water flow;
- Increase in surface water runoff and flood risk due to increased impermeable hardstanding as part of the Proposed Development; and
- Cumulative effects if the potential effects arising from the Proposed Development are in combination with other relevant projects or activities.

10.3.6 The key sensitive receptors identified within this assessment are:

- Surface water;
- Groundwater;
- Flood risk in terms of both: (i) any increase in flood risk posed by the Proposed Development; and (ii) any risk to the Proposed Development itself arising from flooding;
- DWPA and Private Water Supplies;
- GWDTE; and
- Designated sites/ sensitive environments.

10.3.7 As part of the Scoping report the following issues relating to the water environment have been scoped out of the assessment:

- Detailed Flood Risk and Drainage Impact Assessment. Published mapping confirms that virtually all of the Proposed Development is not located in an area identified as being at flood risk and where flood risk is recorded it is limited in extent and bounds watercourse corridors. A screening of potential flooding sources (fluvial, coastal, groundwater, infrastructure etc.) is therefore presented and measures that would be used to control the rate and quality of runoff will be specified in the CEMP;
- Effects associated with all forest felling. This includes felling within the operational corridor and management felling to mitigate the risk of windblow, as described in **Chapter 13: Forestry**. Impacts are scoped out as the amount of forestry felled compared to surface water catchments would be negligible**.** Forest felling would also be undertaken in accordance with industry standard best practice with regard to minimising the potential for pollution and alteration of water drainage paths;
- Baseline water quality monitoring. Water quality data is published by SEPA and can be used to characterise baseline water quality in this assessment;
- Increased flood risk caused by blockages to flow in watercourses during operation and maintenance of the Proposed Development. Any required permanent watercourse crossings would be subject to maintenance requirements under the Controlled Activity Regulations and designated in accordance with SEPA watercourse crossing good practice guide;
- A Geomorphological Assessment. Photographs and records of baseline water features are recorded and presented in this EIA Report; and
- Watercourse crossing assessment of temporary tracks. These would be used as part of the construction phase of the Proposed Development, and measures to mitigate any potential effects would be agreed in the CEMP.

10.3.8 Analysis was conducted that confirmed the extent of proposed felling is negligible compared to the surface water catchments in which the felling would occur. The area of felling was compared to the area of surface

water catchment to produce a percentage of the catchment that will be impacted by felling. Felling amounted for less than 1.15% of the area across the 17 surface water catchments felling is proposed.

10.3.9 Works associated with upgrading existing tracks and roads, including upgrades to existing watercourse crossings, are also outwith the scope of this assessment.

Legislation, Policy and Guidance

10.3.10 The water environment in Scotland is afforded significant protection through key statutes and the regulatory activity of SEPA and the local authorities. Relevant legislation, policy and guidance documents that have been reviewed and considered as part of this assessment are as follows.

Legislation

- The Water Framework Directive (2000/60/EC)[7] (as implemented in Scotland via the Water Environment and Water Services (Scotland) Act 2003)[8];
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011[9];
- Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013[10]; and
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017[11].

Planning Policy

- National Planning Framework 4[12]; and
- Highland Wide Local Development Plan (Policy 63: Water Environment, Policy 64: Flood Risk, Policy 66: Surface Water Drainage and Policy 69: Electricity Transmission Infrastructure).[13]

Guidance

- Planning Advice Note 61: Planning and Sustainable Urban Drainage Systems[14];
- Construction Industry Research and Information Association (CIRIA) Control of Water Pollution from Construction Sites (C532)[15];
- CIRIA Development and flood risk: guidance to the construction industry, C624D[16];
- Planning Advice Note 79: Water and Drainage[17];

[7] European Parliament (2000) Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy ("The Water Framework Directive"). Available online at: http://ec.europa.eu/environment/water/water-framework/index_en.html
[8] Scottish Government (2003). Water Environment and Water Services (Scotland) Act 2003. Available online at: https://www.legislation.gov.uk/asp/2003/3/contents
[9] Scottish Government (2011). The Water Environment (Controlled Activities) (Scotland) Regulations 2011. Available online at: https://www.legislation.gov.uk/ssi/2011/209/contents/made
[10] Scottish Government (2013). The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013. Available online at: https://www.legislation.gov.uk/ssi/2013/29/made
[11] Scottish Government (2017) the Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017 Available online at: https://www.legislation.gov.uk/ssi/2017/282/note/made
[12] Scottish Government (2023). National Planning Framework 4. Available online at: https://www.gov.scot/publications/national-planning-framework-4/
[13] The Highland Council (2012). The Highland-wide Local Development Plan. Available online at: https://www.highland.gov.uk/info/178/development_plans/199/highland-wide_local_development_plan
[14] Scottish Government (2001). Planning Advice Note 61: Sustainable urban drainage systems. Available online at: https://www.gov.scot/publications/pan-61-sustainable-urban-drainage-systems/
[15] CIRIA (2001). Control of water pollution from construction sites. Guidance for consultants and contractors (C532). Available online at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C532&Category=BOOK
[16] CIRIA (2004). Development and flood risk – guidance for the construction industry (C624D). Available online at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C624&Category=BOOK
[17] Scottish Government (2006). Planning Advice Note 79: Water and Drainage. Available online at: https://www.gov.scot/publications/planning-advice-note-pan-79-water-drainage/

- British Standard Code of Practice for Earthworks BS 6031 200928[18];
- SEPA Engineering in the Water Environment Good Practice Guide: River Crossings;
- SEPA Land Use Planning System Guidance Note 31, Version 2. Guidance on Assessing the Impacts of Wind Farm Development Proposals on Groundwater Abstractions and GWDTEs[19];
- SEPA Controlled Activities Regulations (CAR) – A Practice Guide, Version 7.2[20];
- CIRIA The SuDS Manual (C753)[21];
- CIRIA Environmental Good Practice on Site (C741)[22];
- Highways Agency's Design Manual for Roads and Bridges (DMRB) LA 113 – Road drainage and the water environment[23];
- SEPA Supporting Guidance (WAT-SG-75) Sector Specific Guidance: Water Runoff from Construction Sites[24];
- SEPA Guidance on Assessing the Impacts of Development Proposals on Groundwater Water Dependent Terrestrial Ecosystems[25];
- SEPA, Scottish Natural Heritage and Forestry Commission Scotland guidance on Use of Trees Cleared to Facilitate Development on Afforested Land;
- Scottish Natural Heritage: Constructed tracks in the Scottish Uplands[26]; and
- SEPA Pollution Prevention Guidance Notes (PPG) and Guidance of Pollution Prevention (GPP):
  - GPP01: Understanding your environmental responsibilities – good environment practices;
  - GPP02: Above ground oil storage;
  - PPG03: Use and design of oil separators in surface water drainage systems;
  - PPG04: Sewage treatment and disposal where there is no foul sewer;
  - GPP05: Works and maintenance in or near water;
  - PPG06: Working at construction and demolition sites;
  - PPG07: Safe storage - the safe operation of refuelling facilities;
  - GPP08: Safe storage and disposal of used oils;
  - GPP13: Vehicle washing and cleaning;
  - GPP21: Pollution incident response planning; and
  - GPP22: Dealing with spills.

[18] The British Standards Institute (BSI) (2009). BS 6031:2009 Code of Practice for Earthworks. Available online at: https://knowledge.bsigroup.com/products/code-of-practice-for-earthworks/standard

[19] SEPA (2014). Land Use Planning System Guidance Note 31. Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems . Version 2. Available online at: https://www.sepa.org.uk/media/143868/lupsgu31_planning_guidance_on_groundwater_abstractions.pdf

[20] SEPA (2015). Controlled Activities Regulations - A Practical Guide, Version 7.2. Available online at: http://www.sepa.org.uk/media/34761/car_a_practical_guide.pdf

[21] CIRIA (2015). The SuDS Manual (C753). Available at: https://www.susdrain.org/resources/SuDS_Manual.html

[22] CIRIA (2015). C741 Environmental good practice on site guide. 4th edition. Available online at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductcode=C741&Category=BOOK

[23] Highways Agency (2020). Design Manual for Roads and Bridges (DMRB) LA 113 – Road drainage and the water environment, formerly HD45/09, Revision 1. Available online at: https://www.standardsforhighways.co.uk/dmrb/search/d6388f5f-2694-4986-ac46-b17b62c21727.

[24] SEPA (2021). Supporting Guidance (WAT-SG-75) Sector Specific Guidance: Water Runoff from Construction Sites. Available online at: https://www.sepa.org.uk/media/340359/wat-sg-75.pdf

[25] SEPA (2017) SEPA Guidance on Assessing the Impacts of Development Proposals on Groundwater Water Dependent Terrestrial Ecosystems. Available online at: https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions.pdf

[26] Scottish Natural Heritage (2015) Constructed tracks in the Scottish Uplands. Available online: https://cairngorms.co.uk/wp-content/uploads/2019/09/CD039-Scottish-Natural-Heritage-Constructed-tracks-in-the-Scottish-Uplands-2015.pdf

Desk Study

10.3.11 A desk-based study has been conducted as part of the production of the water environment chapter. This involves the collection, analysis and interpretation of a range of data and information sourced from published documents, datasets and consultations relating to the water environment and includes:

- Identification of catchments, watercourses, springs and water features from publicly available desktop sources;
- Collation of data provided through consultations;
- Collation of floodplain information and water quality data;
- Compilation of soils, geological and hydrogeological information; and
- Consultation with THC, Scottish Water and landowners to identify abstractions and private water supplies.

10.3.12 The following sources of information have been consulted alongside good practice guidance and legislation to characterise the baseline conditions within the Study Area:

- Ordnance Survey (OS) 1:50,000 and 1:25,000 scale mapping;
- Flood Estimation Handbook (FEH) web service[27];
- National River Flow Archive (NRFA)[28];
- SEPA Flood Maps[29];
- Scotland's Environment web-based maps[30];
- SEPA Water Environment Hub[31];
- British Geological Survey (BGS) GeoIndex onshore geology viewer[32]; and
- BGS groundwater vulnerability (Scotland) map, Version 2[33].

Field work

10.3.13 The desk-based study was supported by a ground truthing survey undertaken between May 2024 and January 2025. The ground truthing survey focused on verifying the findings of the desk-based study, identifying key hydrological receptors, obtaining details of watercourses subject to crossings and visiting GWDTEs that were identified by the project ecology team.

10.3.14 The data collected as part of the desk-based data collection and site walkover survey have been processed and interpreted to inform the impact assessment, mitigation measures (where required) and the design of the Proposed Development.

10.3.15 Questionnaires were issued to landowners to identify the presence of PWS within the Study Area. A total of 156 questionnaires were sent out into the area and 24 responses were received. This was paired with THC's openly available data on PWS locations[34] to build as clear a view on PWS in the area as possible.

[27] UK Centre for Ecology and Hydrology. Flood Estimation Handbook Web Service. Available online at: https://fehweb.ceh.ac.uk/Map (Accessed 05/11/2024)
[28] NRFA (2024) NRFA Ricer Flow data (Various) https://nrfa.ceh.ac.uk/
[29] SEPA. Flood Maps. Available online at: https://beta.sepa.scot/flooding/flood-maps/
[30] Scotland's Environment (various) Scotland's Environment Map. Available online at: https://nrfa.ceh.ac.uk/data/search https://www.environment.gov.scot/maps/scotlands-environment-map/ (Accessed 05/11/2024)
[31] SEPA (2021) Water Environment Hub. Available online at: https://informatics.sepa.org.uk/RBMP3/ (Accessed 05/11/2024)
[32] British Geological Survey. Geoindex Onshore Map Viewer. Available online at: https://mapapps2.bgs.ac.uk/geoindex/home.html (Accessed 05/11/2024)
[33] British Geological Survey (2011). User Guide: Groundwater Vulnerability (Scotland) GIS dataset, Version 2. Available online https://nora.nerc.ac.uk/id/eprint/17084/1/OR11064.pdf (Accessed 26/11/2024)
[34] The Highland Council (2024) Highland Council Open Map Data. Available online https://map-highland.opendata.arcgis.com/datasets/private-water-supplies

Methodology for Assessment of Effects

Sensitivity of Receptors

10.3.16 The sensitivity of the receptor for the water environment is determined using professional judgement, consideration of existing designations (such as Sites of Special Scientific Interest (SSSIs)) and quantifiable data, where possible. Examples of this are highlighted in **Table 10.2**.

Table 10.2: Framework for Determining the Sensitivity of Receptors

Sensitivity	Definition
High	The receptor is of international or national importance with limited ability to absorb change without fundamentally altering its present character. The receptor is of local scale and of high environmental value and rarity or is of national or regional scale and of moderate/medium environmental value and rarity.
Medium	The receptor is of regional importance with limited ability to absorb change without fundamentally altering its present character. The receptor is of local scale and of medium environmental value and rarity or is of national or regional scale and of low environmental value and rarity.
Low	The receptor is of local importance and scale, tolerant of change without detriment to its character and is of low environmental value and rarity.
Negligible	The receptor is resistant to change and is of little environmental value.

Impact Magnitude

10.3.17 The impact magnitude is identified and predicted as a deviation from the established baseline conditions, for the construction phase of the Proposed Development. Examples of this in the water environment are highlighted in **Table 10.3**.

Table 10.3: Framework for Determining the Impact Magnitude

Impact Magnitude	Definition
Major	A fundamental change to the baseline condition of the asset, leading to total loss or major alteration of character: • A short- or long-term major shift in hydrological conditions sufficient to negatively change the ecology of the receptor. This change would equate to a downgrading of a watercourse quality classification by two classes e.g. from “High” to “Moderate”; • A sufficient material increase in the probability of flooding onsite and offsite, adding to the area of land which requires protection by flood prevention measures or affecting the ability of the functional flood plain to attenuate the effects of flooding by storing flood water; • A major (greater than 50 %) or total loss of a geological receptor, or where there would be complete severance of a site such as to fundamentally affect the integrity of the site (e.g. blocking hydrological connectivity); • Major permanent or long-term negative change (i.e., degradation of quality) to groundwater quality or a reduction in the available yield; • Changes to quality or water table level which will cause harm local ecology or will lead to flooding issues.
Moderate	A material, partial loss or alteration of character: • A short or long term non-fundamental change to the hydrological environment, resulting in a change in ecological status. This change would equate to a downgrading of a watercourse quality classification by one class e.g. from “Good” to “Moderate”;

Impact Magnitude	Definition
	• A moderate increase in the probability of flooding onsite and offsite, adding to the area of land which requires protection by flood prevention measures or affecting the ability of the functional flood plain to attenuate the effects of flooding by storing flood water; • Changes to the local groundwater regime may slightly affect the use of the receptor; • The yield of existing supplies may be reduced or quality slightly deteriorated; and / or • Fundamental degradation of local habitats may occur, resulting in impaired functionality.
Minor	A slight, detectable, alteration of the baseline condition of the asset: • A detectable non-detrimental change to the baseline hydrological environment. This change would not reduce the watercourse quality classification; • A marginal increase in the probability of flooding onsite and offsite, adding to the area of land which requires protection by flood prevention measures or affecting the ability of the functional flood plain to attenuate the effects of flooding by storing flood water; • A detectable but non-material effect on the receptor or a moderate effect on its integrity as a feature or where there would be a minor severance or disturbance such that the functionality of the receptor would not be affected; and / or • Changes to groundwater quality, levels or yields that do not represent a risk to existing baseline conditions or ecology.
Negligible	A slight, detectable, alteration of the baseline condition of the asset: • A detectable non-detrimental change to the baseline hydrochemistry or hydrological environment. This change would not reduce the watercourse quality classification; • A marginal increase in the probability of flooding onsite and offsite, adding to the area of land which requires protection by flood prevention measures or affecting the ability of the functional flood plain to attenuate the effects of flooding by storing flood water; • A detectable but non-material effect on the receptor or a moderate effect on its integrity as a feature or where there would be a minor severance or disturbance such that the functionality of the receptor would not be affected; and / or • Changes to groundwater quality, levels or yields that do not represent a risk to existing baseline conditions or ecology.

Significance Criteria

10.3.18 The assessment of significance considers the impact magnitude, the sensitivity of the receptors, and the extent to which mitigation and enhancement will reduce or reverse the significance of effects, as shown in **Table 10.4**.

10.3.19 Through the assessment, the potential significance of effects is concluded to be of major, moderate, minor, or negligible. Major and moderate effects are considered significant, and minor and negligible effects are considered not significant. Effects are considered adverse unless stated otherwise.

Table 10.4: Framework for Assessment of the Significance of Effects

		Sensitivity of Receptor/Receiving Environment to Change/Effect			
		High	Medium	Low	Negligible
Impact Magnitude	High	**Major**	**Major**	**Moderate**	Negligible
	Medium	**Major**	**Moderate**	Minor	Negligible
	Low	**Moderate**	Minor	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Limitations of Assessment

10.3.21 The key assumptions and limitations relevant to the preparation of this EIA chapter are set out below:

- Baseline conditions have been established from a variety of sources; due to the dynamic nature of the water environment, conditions will change during the construction and operation of the scheme;
- It is assumed that information received by third parties is complete and up to date;
- Construction methods have been assumed based on similar projects that SSEN Transmission have undertaken;
- The PWS data collected from THC does not define whether the supplied locations are the point of a private water supply source or the property served. Information from Landowners Questionnaire (LOQs) only represents Landowners who responded to the survey. It is therefore possible that there are unknown PWS. Principal Contractors will conduct a PWS screening as part of the pre commencement surveys which will identify PWS and implement the mitigation measures which are detailed in **Volume 5, Appendix 10.2: DWPA and PWS Risk Assessment**; and
- The assessment of effects assumes that the embedded mitigation measures including CEMP and GEMPs are implemented.

Embedded Mitigation and Mitigation by Design

10.3.22 Detailed constraints advice was provided during the iterative layout design process for the towers and associated infrastructure. Fieldwork was undertaken to provide feedback to the design team.

10.3.23 The Proposed Development has been designed to reduce potential impacts as far as reasonably practicable. This includes mitigation that is embedded into the design in accordance with industry standard methods and procedures and from consideration of environmental constraints identified during the EIA process. This mitigation is implemented through the plans and approach summarised below. A summary of the embedded mitigation incorporated into the Proposed Development design to reduce the effects on the water environment in the Study Area is presented in **Table 10.5**. A full list of embedded mitigation relevant to all disciplines is listed in **Chapter 3: Description of the Proposed Development**. No additional mitigation has been proposed as part of this assessment.

General Environmental Management Plans

10.3.24 The adoption of the applicable GEMPs would reduce the probability of an incident occurring, and also reduce the magnitude of any incident, due to a combination of good site environmental management procedures including minimised storage soil and peat volumes, soil management, staff training, contingency equipment and emergency plans.

10.3.25 The GEMPs (**Volume 5**, **Appendix 3.3**) applicable to this chapter are:

- Working in or Near Water;
- Watercourse Crossings;
- Forestry;
- Private Water Supplies;
- Soil Management;
- Dust Management;
- Bad Weather;
- Working in Peatland and Sensitive Habitats;
- Working with Concrete; and

- Waste Management.

Construction and Environmental Management Plan

10.3.26 A contractual management requirement of the Principal Contractors will be the development and implementation of a CEMP. This document will detail how the Principal Contractors would manage the works in accordance with all commitments and mitigation detailed in this EIA Report, Applicant's GEMPs, statutory consents and authorisations, and industry best practice and guidance, including pollution prevention guidance.

10.3.27 The CEMP will also outline measures to ensure that the works minimise the risk to groundwater, surface water, PWS, DWPAs, and licensed water uses.

10.3.28 It is expected that the following will be included in the CEMP, as a minimum, and would ensure the works are undertaken in accordance with good practice guidance:

- Measures to protect and safeguard PWS, DWPAs, and associated distribution pipework;
- Any above ground on-site fuel and chemical storage would be bunded;
- Emergency spill response kits would be maintained during the construction works;
- A vehicle management system would be put in place wherever possible to reduce the potential conflicts between vehicles and thereby reduce the risk of collision;
- Suitable access routes which minimise the potential requirement for either new access tracks or for tracking across open land which could contribute to the generation of suspended solids;
- A speed limit would be used to reduce the likelihood and significance of any collisions;
- Drip trays will be placed under vehicles which could potentially leak fuel/oils;
- Any temporary construction / storage compounds required will be located remote from any sensitive surface water receptors or PWS and will be constructed to manage surface water run-off in accordance with best practice;
- Any water contaminated with silt or chemicals will not be discharged directly or indirectly to a watercourse without prior treatment; and
- Water for temporary site welfare facilities will be brought to site, and foul water will be collected in a tank and collected for offsite disposal at an appropriately licensed facility.

10.3.29 A wet weather protocol will be developed. This will detail the procedures to be adopted by all staff during periods of heavy rainfall. Toolbox talks would be given to engineering/construction/supervising personnel. Roles would be assigned, and the inspection and maintenance regimes of sediment and runoff control measures would be adopted during these periods. In extreme cases, the above protocol would dictate that work onsite may have to be temporarily suspended until weather/ground conditions allow. Furthermore, Scottish Water best practice guidance for construction and land management practices in DWPAs will be adhered to and included in the CEMP[35].

Site Water Management and Pollution Prevention Plan

10.3.30 The Site Water Management and Pollution Prevention Plan is provided in **Volume 5, Appendix 10.4**. Plans have been produced by the Principal Contractors. These identify and illustrate the water management and pollution prevention measures to be implemented during the construction of the Proposed Development. The plan has been developed in accordance with SEPA guidance and 'The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)'. The plan sets out a range of best practice water control

[35] Scottish Water (2024) Sustainable Land Management https://www.scottishwater.co.uk/Help-and-Resources/Document-Hub/Key-Publications/Sustainable-Land-Management

measures to prevent pollution incidents and impacts to watercourses and flow paths including sediment control measures, watercourse crossing best practices, drainage planning, emergency preparedness and response and training approaches. The measures set out in this plan will inform the methods applied by staff during construction in order to embed water protection measures within the construction of the Proposed Development.

Steel Lattice Tower Foundation Construction

10.3.31 The following measures will be incorporated into the CEMP to mitigate the effects on hydrology of constructing the foundations for the steel lattice towers:

- Tower foundations would be located and excavated wherever possible in the driest locations with well consolidated superficial geology. Avoiding wetland areas, areas of deep peat and maintaining a standoff buffer that is in accordance with SEPA recommended riparian corridor to watercourses and waterbodies, would be adhered to wherever possible;
- Wherever possible, towers would be located out with floodplains to reduce potential effects from flooding;
- Where excavations for tower foundations encounter limited quantities of groundwater or become flooded due to surface water runoff or heavy rainfall, appropriate removal by dewatering would be instigated under direction of the site Ecological Clerk of Work (ECoW);
- No dewatering discharge would be permitted directly adjacent to, or into, surface watercourses or water bodies;
- Unless directed otherwise by the site ECoW, dewatering discharge would drain across buffer areas of vegetation (e.g. grassland, heather) of at least 20 m width, which would provide for natural attenuation and dispersal of the flow and removal of silt;
- Where no suitable vegetation is available for natural treatment of dewatering, the discharge would be passed through on-site settling tanks/lagoons prior to discharge by soakaway or to watercourse;
- The requirement for dewatering would be minimised in all locations by timely and efficient excavation of the foundation void and subsequent concrete pouring and backfilling;
- Excavated soils would be used to restore foundation excavations and be placed in the order they were removed from the foundation;
- Turves would be used to dress the restored foundation excavations;
- All procedures for dewatering would be agreed by the Principal Contractors with SEPA, THC and NatureScot as appropriate, and detailed in the CEMP; and
- The Principal Contractors would develop a method statement to address the transport, transfer, handling and pouring of liquid concrete at tower foundation sites.

Embedded Mitigation

10.3.32 Embedded mitigation that will be in place for the Proposed Development is detailed below in **Table 10.5**.

Table 10.5: Embedded Mitigation

Reference	Mitigation	Description
WE1	Watercourse Buffers and Alterations	SEPA's recommended riparian corridor watercourse buffers (buffers that have been produced by SEPA that range from 10 m to 30 m depending on channel width) are implemented for towers and ancillary infrastructure. There are 23 instances where this buffer is not achievable as shown in **Table 10.37,** and the final location would be determined on site in consultation with the project ECoW. The following measures will be in place for such locations that cannot be microsited outside of the SEPA Recommended Riparian Corridor:

Reference	Mitigation	Description
		• Location specific drainage, pollution prevention and incident response plans; • Induction and training for staff highlighting sensitivities; • A wet weather working protocol and provision to cease works during prolonged rainfall or periods of high runoff (pluvial or fluvial) as detailed in the Wet Weather GEMP shown in **Volume 5, Appendix 3.3: GEMPs**; • Working area as small as reasonably practicable within the buffers to minimise the potential to disturb ground; • Additional passive water quality control measures, such as temporary water diversion ditches, silt fences and silt traps to control and treat runoff from working areas; • Daily inspection of works and watercourses and supervision of construction, restoration and dismantling works; • Deployment of real-time water quality monitoring telemetry with predetermined water quality trigger levels based on baseline water quality data (e.g. for pH, dissolved oxygen and electrical conductivity); and • Documentation that clearly identifies responsibilities and actions and contact details should a pollution event be recorded. A 10 m vegetation buffer strip will be left intact around watercourses during construction where possible, within which no storage or construction works will take place in accordance with SEPA Good Practice Guidance WAT-SG-29. The Proposed Development will utilise existing access tracks where feasible; this will help to minimise ground disturbance and requirement for watercourse crossings. Watercourse crossings will implement the following approach to adhere to good practice in relation to new water crossings: • The design of the watercourse crossings would be agreed with SEPA prior to construction and be regulated in accordance with Controlled Activities Regulations (CAR); • The appropriate crossing type would be identified from SEPA's good practice guidance and would take into account any ecological and hydrological constraints; and • The crossing would be sized and designed so as to minimise effect upon flood risk (sized to accommodate at least the 200-year climate change flow). For watercourse crossings less than 2 m wide CAR General Binding Rules will be adhered to. Bog mats, or similar, would be positioned across the water course to enable access, where necessary, side rails will be installed with silt mitigation if required to ensure that silt impacts from vehicles crossing are controlled at all times. Crossings will be cleaned at the end of the day if required. Any watercourse alterations will be subject to CAR authorisation. Where watercourses are altered, structures appropriate to the localised conditions will be installed. It is anticipated that these alterations will be designed as appropriately sized culverts in line with SEPA's good practice guidance, SEPA CAR Practical Guidance (In particular the General Binding Rules), the Site Water Management and Pollution Prevention Plan and the GEMPs.
WE2	Pollution and Spillage	Construction good practice methods, outlined within the CEMP and the GEMPs, will limit the potential risk of spillages and contamination, to reduce the potential for chemical pollutants to be transferred to the water environment and protect watercourses from impacts related to construction works. Additional measures such as absorbent spill pads / kits and other measures highlighted within the CEMP will effectively limit the uncontained release of chemicals to minor fugitive releases. These would be minimised through best practice construction methods such as storing fuel away from where they could be

Reference	Mitigation	Description
		hit by moving vehicles and regular vehicle and machine maintenance. Routine training practices such as staff inductions and toolbox talks will be conducted throughout construction.
WE3	Erosion and Sedimentation	Good practice site environmental management measures set out in the Soil Management GEMP will reduce any potential effects of soil erosion and sedimentation. A 10 m vegetation buffer strip around watercourses during construction will be left intact where possible, within which no storage or construction works will take place.
WE4	Modifications to Hydrogeology and Groundwater	Prior to excavation works, ground investigations will be conducted by an appointed contractor, which will include identifying groundwater levels within the areas of excavation. Where groundwater is identified dewatering or groundwater diversion will be conducted with mitigation and control measures in accordance with best practice guidance (e.g., CIRIA Groundwater Control). Measures relating to the identification and protection of groundwater will be detailed and secured within the CEMP. This would include: • A Pollution Prevention Plan (PPP) is implemented to ensure good practice working methods are followed throughout construction works; • An Environmental Auditing and Monitoring Plan will monitor all work that could impact groundwater; • A Water Management Plan will detail how drainage will be managed during construction to protect groundwater; and • A Soil Management Plan will detail how soil will be stripped stored and reinstated to protect groundwater.
WE5	GWDTEs and Designated Sites	Prior to access track construction, site operatives will identify flush areas, depressions or zones which may concentrate water flow. These sections will be spanned with plastic pipes or drainage matting to ensure hydraulic conductivity under the track and reduce water flow over the track surface during heavy precipitation. The following good practice construction and design measures will be implemented during construction and secured through the CEMP and GEMPs to ensure that effects on designated and wetland habitats are minimised: • A PPP is implemented to ensure good practice working methods are followed throughout construction works; • Silt traps will be deployed to trap and filter sediment-laden run-off throughout the construction phase of the Proposed Development; • Settlement lagoons will be constructed and actively managed to control water levels and ensure that any run-off is contained, especially during times of rainfall; • Foundations are constructed in holes in the ground that will be dewatered, and hence water flow is typically into the foundation area. This dewatering will prevent concrete leaching into groundwater or surface water in the event of shutter collapse; and • All excavations will be sufficiently dewatered before concrete pours begin and that dewatering will continue while the concrete cures. However, construction good practice will be followed to ensure that fresh concrete is isolated from the dewatering system. As set out in Volume 5, Appendix 10.3: GWDTE Assessment where there will be excavations of >1 m within 250 m and <1 m within 100 m of GWDTEs, a quantitative assessment may be required in accordance with SEPA GWDTE Guidance to demonstrate that there is no degradation in the quality of groundwater

Reference	Mitigation	Description
		and hydrological connectivity. The methodology and frequency of any monitoring will be secured and agreed in consultation with SEPA on a case-by-case basis.

WE6	Drinking Water Protected Areas and Private Water Supplies	The Principal Contractors will verify the location of PWS source locations, types and uses. Further consultation would be held with the property/landowner as part of this process if any further PWS were to be identified.
		The Principal Contractors will consider all construction activities and ensure they are aware of all PWS within the surrounding area that may be at risk as a result of the Proposed Development. Should this process identify any PWS which require protection an approach will be developed and agreed with THC.
		The Principal Contractors will complete construction works in accordance with the measures and approach set out in the Private Water Supplies GEMP.
		• Where potential impacts to PWS are identified, a detailed quantitative risk assessment (DQRA) would be undertaken. If the DQRA confirms the potential impacts are Major or Medium, then are identified a PWS monitoring programme will be implemented in accordance with the site-specific mitigation measures will be implemented which are as set out in full **in Volume 5, Appendix 10.2: DWPA** and PWS Risk Assessment and are as follows: Pre construction water quality monitoring as set out in a site-specific monitoring plan where this is required following the detailed quantitative risk assessment;
		• Where possible and if not already in place, fence off the PWS intake (to avoid accidental damage and to deter animals) and identify relevant buffer distances;
		• Installation of silt mitigation to prevent runoff from works areas entering the PWS, using a precautionary approach as not all flow pathways may be immediately obvious;
		• When undertaking works within PWS catchments during wet weather or when wet weather is forecast the control measures set out in the Bad Weather GEMP and Private Water Supplies GEMP will be followed;
		• Use low impact access methodologies, as far as reasonably practicable, including, but not limited to, the use of floated tracks or track panels where works are within the PWS catchment;
		• Survey and mark out the route of the PWS infrastructure in the vicinity of the construction works and avoid / minimise activity within this area;
		• Ensure all site operatives working in the area are made aware of the location of the PWS and catchment area, and mitigation measures required through toolbox talks or similar;
		• Use of signage should be considered to remind workers when works take place in areas near to PWS infrastructure; and
		• Put in place measures to protect infrastructure where they cross beneath roads/access tracks. These may include:
		  ○ Setting the existing pipe work within mass concrete;
		  ○ Upgrading or rerouting the existing pipe work;
		  ○ Ensuring that there are adequate pollution control and emergency response measures in place to deal with any accidents that could affect a water supply (e.g. spill response or sediment control);
		  ○ Implementation of regular, recorded checks on any pipework (visible signs of cracking or other damage); and
		  ○ Provision of an alternative supply (temporary / permanent), e.g. taking a surface water abstraction to a point above the works to

Reference	Mitigation	Description
		prevent potential downstream contamination from works impacting upon the supply.
WE7	Soil Loss and Compaction	The measures set out in the Soil Management GEMP will limit potential impacts on soil compaction and quantities. Traffic routes will be clearly defined throughout construction with vehicles not permitted to route through ground outwith the defined access. Access to unstripped grounds will be limited to low weight and tracked vehicles. A defined working area, where soil stripping will take place, will be set for construction with the number of working areas planned for and managed to ensure that soil transportation within the site is limited. Stripping will be undertaken with care and in accordance with industry standard best practice measures with topsoil and sub-soils being removed and stored in clearly separated bunds on unstripped grounds.
WE8	Peat and Soil Management	The following measures are considered sufficient, and sufficiently reliable, to avoid substantial alterations to the natural drainage regime and are included in **Volume 5**, **Appendix 11.2: Outline Peat Management Plan**: • Any peat and peaty soils will be reinstated on temporary access tracks and infrastructure verges with turves placed on the upper horizons, encouraging revegetation; • All peat, soil and turves excavated from beneath infrastructure will be reinstated in the vicinity of its original location; • Any wet catotelmic peat will be placed at the bottom of any restoration profile, followed by semi-fibrous catotelmic peat and acrotelmic peat should be placed at the top; • Peatland restoration activities will be overseen by the ECoW to ensure methods are properly adhered to; • The surface layer of peat (acrotelm) and vegetation will be stripped and stored separately from the catotelmic peat. This will typically be an excavation depth of up to 0.5 m; • Careful handling is essential to retain any existing structure and integrity of the excavated materials and thereby maximise the potential for excavated material to be re-used; • Less humified catotelmic peat which maintains its structure upon excavation should be kept separate from any highly humified amorphous or wet catotelmic peat; • Acrotelmic material will be replaced as intact as possible once construction progresses / as it is complete; • Temporary storage of peat will be minimised, with restoration occurring in parallel with other works; • Suitable storage areas should be sited in locations with lower ecological value, low stability risk and at a suitable distance from water courses; • Peat should be stored in stockpiles no greater than 2 m in height; • Reinstatement will, in all instances, be undertaken at the earliest opportunity to minimise storage of turves and other materials; • Managing the construction work as much as possible to avoid periods when peat materials are likely to be wetter i.e. high rainfall events; and • Transport of peat on Site from excavation to temporary storage and restoration site should be minimised.
WE9	Flood Risk and Drainage	Where watercourse crossings cannot be avoided, crossings will be designed to convey flows for a 1 in 200-year (plus climate change) storm event in accordance with SEPA guidance. The design and capacity of the watercourse crossings would

Reference	Mitigation	Description
		be agreed by the Principal Contractors in consultation with SEPA as part of the detailed design. Where areas of anticipated significant hardstanding are present which have the potential to increase surface water runoff and flood risk elsewhere, onsite drainage systems will be installed. The drainage systems will be designed in accordance with SuDS principles and attenuate surface water runoff from the Proposed Development to a 1 in 200-year plus climate change allowance whilst limiting discharge rates to the calculated greenfield runoff rate. The design of the drainage systems will be confirmed by the Principal Contractors as part of the detailed design. The Principal Contractors will ensure no new permanent features which are sensitive to flooding are located within the floodplain.

10.4 Baseline Conditions

Current Baseline

10.4.1 The current baseline environmental conditions are described in relation to aspects of the water environment surrounding the Proposed Development which includes details on:

- Surface water hydrology and drainage;
- Locations of known DWPAs and PWS;
- Proximity to statutory designated sites;
- Level of flood risk;
- Groundwater quality and hydrogeology of the area;
- Presence of GWDTEs; and
- The water quality of the watercourses draining the site and sub-catchment.

10.4.2 As the Proposed Development will travel through a large number of catchments, the baseline and assessment of effects have been split into different sections from A - E, as set out in **Volume 2, Chapter 5: EIA Process and Methodology**. This section outlines the baseline water environment within the Study Area, as shown on **Volume 3, Figure 10.1: Water Environment Study Area**.

10.4.3 A review of OS 1:50,000 maps, aerial photography and hydrology site walkovers has been used to identify the number of watercourse crossings in each section as per **Volume 5**, **Appendix 10.1: Schedule of Watercourse Crossings.**

10.4.4 Information from LOQs and THC have identified PWS within 1 km of the Proposed Development and scoped into this assessment, which are detailed in the baseline conditions for each section.

10.4.5 In accordance with SEPA guidance and their Scoping Response, an assessment of GWDTE has been undertaken and is presented as **Volume 5**, **Appendix 10.3: GWDTE Assessment**. A summary of the habitat surveys completed is provided in **Chapter 8: Ecology and Nature Conservation** along with a detailed NVC habitat plan which has been used to inform the assessment of GWDTEs. A summary of the GWDTEs for each section of the Proposed Development are detailed in the respective baseline conditions section below.

Section A – Spittal to Brora

Hydrology

10.4.6 This section of the Proposed Development spans from Spittal to Brora. The Proposed Development travels over the following catchments which are listed below from north to south and are shown in **Volume 3**, **Figure 10.3 Surface Water Catchments**:

- River Thurso;
- Wick River;
- Wick Coastal;
- Dunbeath Water;
- Berriedale Water;
- Brora Coastal; and
- River Helmsdale.

10.4.7 River Thurso catchment travels north from its source, eventually feeding into the North Sea at Thurso. The rest of the catchments across Section A travel southeasterly from the source of these principal watercourses into the North Sea down Scotland's northeast coast. There are numerous tributaries (named and un-named) to these principal watercourses.

10.4.8 A review of OS 1:50,000 maps, aerial photography and hydrology site walkovers indicate that this section will feature approximately 81 watercourse crossings, 23 of which are permanent and 58 are temporary. These are shown in more detail in **Volume 5**, **Appendix 10.1: Schedule of Watercourse Crossings**.

10.4.9 There are no surface water DWPAs (rivers or lochs) within 1 km or in significant hydrological connection to Section A of the Proposed Development.

Private Water Supplies

10.4.10 Information from LOQs and THC have identified five PWS within 1 km of the Proposed Development and scoped into this assessment. The results from these surveys are compiled in **Table 10-6**. PWS across the Proposed Development are shown in **Volume 3, Figure 10.6: Private Water Supplies (Confidential)**.

Table 10.6: PWS within 1 km of Section A

Property name	Property ID	PWS Type	Source Type	Location of supply	Potentially Hydrologically connected to the Proposed Development	Mitigation Required ?	Source
PWS Caen House and Croft 205	PWS 1	Domestic and Livestock	Spring	301578, 917904	Potentially hydrologically connected to the Proposed Development as the PWS is a groundwater/spring fed and located within 100 m of excavations of less than 1 m in	Yes	THC

Property name	Property ID	PWS Type	Source Type	Location of supply	Potentially Hydrologically connected to the Proposed Development	Mitigation Required ?	Source
					depth, in accordance with SEPA guidance.		
PWS Kintradwell Lodge	PWS 6.1	Commercial	Surface Water - Stream	291200, 908700	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC
	PWS 6.2	Domestic, Industrial, Commercial, Livestock and Holiday Let/Hotel	Stream	Confidential	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	Questionnaire
PWS Benechiel	PWS 15	Domestic	Groundwater	318500, 9392000	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC
PWS Ousdale	PWS 16	Tied Property	Groundwater	306764, 920526	Potentially hydrologically	Yes	THC

Property name	Property ID	PWS Type	Source Type	Location of supply	Potentially Hydrologically connected to the Proposed Development	Mitigation Required ?	Source
					connected to the Proposed Development as the PWS is located within 250 m of excavations of greater than 1 m in depth; in accordance with SEPA Guidance.		

Statutory Designated Sites and Sensitive Environments

10.4.11 The designated sites and sensitive water-related environments that have been scoped in for this assessment for Section A of the Proposed Development are shown in **Table 10.7.** Designated sites across the Proposed Development are illustrated in **Volume 3, Figure 10.9: Designated Sites.**

Table 10.7: Section A Designated Sites

Designated Site/ Sensitive Environment	Distance to Proposed Development (m)	Hydrological Connected to Proposed Development
The Flow Country World Heritage Site	0	Yes. Proposed Development travels over this and is assumed to be hydrologically connected. Towers N24-N28, Towers N33-N37, Towers N126-N138, Tower N148. The Flow Country reaches into the 1 km buffer and is downgradient of the Proposed Development between Towers N62-N67 and Towers N103-N105. Further details on The Flow Country and potential impacts to the World Heritage Site are found in **Volume 5, Appendix 8.10: WHS Toolkit**.
Dunbeath Water SSSI	0	Yes, receptor is downgradient of Proposed Development and works related to the Proposed Development. Forestry Removal is 23 m upgradient from Dunbeath Water watercourse. Designated site is 50 m from Tower N83 and 200 m from Dunbeath Water watercourse. Tower N84 is 50 m from Designated site and 180 m from Dunbeath Water Watercourse.
Berriedale Water SSSI, SAC	0	Yes, receptor is downgradient of Proposed Development and works related to the Proposed Development. Forestry removal is beside watercourse. Tower N109 is 32 m from the designated site and 200 m from Berriedale Water watercourse. Tower N110 is 15 m from designated site and 250 m from Berriedale Water watercourse.
Langwell Water SSSI, SAC	0	Yes, receptor is downgradient of Proposed Development and works related to the Proposed Development. Forestry removal is beside watercourse. Tower N115 is within designated site area and 150 m from watercourse Langwell water.
Shielton Peatlands SAC	0	Yes, assumed to be hydrologically connected. Ten towers located on top of this designated site. Towers N24-N28 and Towers N33-N37.

Designated Site/ Sensitive Environment	Distance to Proposed Development (m)	Hydrological Connected to Proposed Development
Peat Bog (Caithness and Sutherland Peatlands)	0	Yes. Tower N34 and temporary access track is placed on top of this wetland.
Coire na Beinne Mires SSSI	329	No, receptor is upgradient of Proposed Development and the A9 road acts as a barrier.
Banniskirk quarry SSSI	367	No, receptor is upgradient of the Proposed Development.
Wet Grassland (Coire na Beinne Mires)	440	No, receptor is upgradient of the Proposed Development.
Springs flushes and seepages	440	No, receptor is upgradient of the Proposed Development
Caithness and Sutherland Peatlands	500	No, receptor is upgradient of Proposed Development and the A9 road acts as a barrier.
Peat Bog (Burn of Latheronwheel)	500	No, receptor is upgradient of Proposed Development and the A9 road acts as a barrier.
Ousdale Burn SSSI	511	Yes. Assumed to be hydrologically connected. Tower N129 37 m from Ousdale burn, 1.3 km upstream of designated site area.
Non- Specific Wetland (Coire na Beinne Mires)	600	No, receptor is upgradient of Proposed Development and the A9 road acts as a barrier.
Peat Bog (Coire na Beinne Mires)	610	No, hydrologically upstream of development.
Springs flushes and seepages (Caithness and Sutherland Peatlands)	400	No, receptor is upgradient of the Proposed Development.
Blar nam Faoileag SSSI	732	No, receptor is upgradient of Proposed Development and the A9 road acts as a barrier.
River Thurso SAC	748	No, receptor is upgradient of Proposed Development and the A9 road acts as a barrier.
Wet Grassland (Blair nam Faoileag)	900	No, disconnected by A9 and Little River.
Non-specific Wetland (Blair nam Faoileag)	950	No. disconnected by A9 and Little River.

Flood Risk

10.4.12 Section A was determined to be at a localised risk from flooding from localised fluvial sources and surface water sources as shown in **Table 10.8**. Flood Risk across the Proposed Development is illustrated in **Volume 3, Figure 10.10: SEPA Flood Map Flood Zones**.

Table 10.8: Sources of Flood Risk Across Section A

Flooding Source	Potential Flood Risk to the Proposed Development	Justification
Coastal flooding	No	The SEPA Flood Map shows that the Proposed Development is not at risk of tidal or coastal flooding.
Fluvial flooding	Yes (localised)	The SEPA Flood Map shows that fluvial flood extents associated with the watercourses crossed by the Proposed Development are localised and do not extend significantly beyond the watercourses. Areas of high risk are crossed by the Proposed Development as detailed in **Table 10.9**. With appropriate design and embedded mitigation, this is not considered a development constraint.
Surface water flooding	Yes (localised)	SEPA flood maps indicate that the majority of the Proposed Development is not at risk from surface water flooding, however, small discrete areas of flooding are shown which are associated with small topographic lows. Areas with high likelihood of surface water flooding are detailed in **Table 10.9.** Surface water flooding is not considered to be a design constraint and potential effects can be mitigated by drainage measures detailed in **Table 10.5**.
Groundwater Flooding	No	The SEPA groundwater flood map illustrates that the Proposed Development is not considered at risk from potential groundwater flooding.
Flood Defence Breach (failure)	No	The Proposed Development does not benefit from the protection of any flood defences.
Flooding due to Artificial Drainage	No	The Proposed Development is located remote from any artificial drainage systems.
Flooding due to infrastructure failure	No	SEPA has produced reservoir inundation maps for those sites currently regulated under the Reservoirs Act 1975[36]. Review of these maps indicates no risks related to reservoir breach scenarios near the Proposed Development.

10.4.13 Likelihood of flooding from rivers and surface water that are crossed by this section of the Proposed Development is shown in **Table 10.9**.

Table 10.9: Flood Risk Within 1 km of Section A

Type of Flooding	Likelihood	Water Body Name(s)
Fluvial	High	• Black Burn; • Wick River; • Loch of Toftingall; • Loch Burn; • Halsary Burn (and tributaries); • Allt Caol; • Burn of Tacher; • Little River/ Loop Burn (and tributaries); • Loch Rangag;

[36] UK Government (2022) Reservoirs Act 1975. Available online at: https://www.legislation.gov.uk/ukpga/1975/23

Type of Flooding	Likelihood	Water Body Name(s)
		• Burn of Latheronwheel (and tributaries); • Burn of Houstry; • Allt an Learanaich; • Dunbeath Water; • Achorn Burn; • All Tarsuinn (and tributaries); • Allt na Buaidhe; • Berriedale Water (and tributaries); • Ousdale Burn; • River Helmsdale; • Gartymore Burn; • Loth Burn (and tributaries); • Kintradwell Burn; and • Oulmsdale Burn.
Surface water	High	• Little River/ Loop Burn (and tributaries); • Loch Rangag; and • Borgue Loch.

Hydrogeology

10.4.14 The BGS GeoIndex Viewer indicates the following hydrogeology across Section A:

- The majority of the northern and southern areas of Section A of the Proposed Development are underlain by the Middle Old Red Sandstone, classified as a moderately productive bedrock aquifer comprised of sandstones, mudstones, conglomerates and interbedded lavas which yield small amounts of groundwater locally.
- The Moine Supergroup is present locally throughout Section A. This aquifer is classed as low productivity, yielding small amounts of groundwater in near surface weathered zones and secondary fractures.
- An Unnamed Igneous Intrusion (Late Silurian to Early Devonian) is mapped underlying central areas of Section A. This intrusive complex is classed as a low productivity aquifer that yields small amounts of groundwater in near surface weathered zones and secondary fractures with rare springs.
- The Lower Old Red Sandstone is present locally throughout the central areas of Section A, classified as a multi-layered, moderately productive aquifer where flow is virtually all through fractures and other discontinuities.

10.4.15 Hydrogeology across the Proposed Development is illustrated in **Volume 3, Figure 10.5: BGS 625,000 Scale Hydrogeology**.

10.4.16 There are three groundwater bodies underlying Section A of the Proposed Development; Caithness (ID: 150692), Northern Highlands (ID: 150701), and Brora (ID: 150703), which all have a SEPA overall condition classification of 'Good' as of 2023. The Caithness groundwater body has an aquifer typology of Old Red Sandstone and has low to high aquifer productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Northern Highlands groundwater body has an aquifer typology of Precambrian North and has low or very low productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Brora groundwater body Old Red Sandstone North and has low to high aquifer productivity. It is overlain by moderate to low permeability strata which is several metres thick. Groundwater classifications across the Proposed Development are illustrated in **Volume 3, Figure 10.4: Groundwater Classifications**.

10.4.17 BGS groundwater vulnerability (Scotland) map shows that parts of Section A of the Proposed Development are defined as class 5 which means it is vulnerable to most pollutants, with rapid impact in many scenarios. The remainder of Section A is class 4 which is defined as vulnerable to those pollutants not readily absorbed or transformed.

10.4.18 As a result of the receptor's 'Good' overall status and groundwater vulnerability, groundwater is considered to be of High sensitivity in Section A of the Proposed Development.

Groundwater Dependent Terrestrial Ecosystems

10.4.19 In accordance with SEPA guidance and their Scoping Response, an assessment of GWDTE has been undertaken and is presented as **Volume 5**, **Appendix 10.3: GWDTE Assessment**. A summary of the habitat surveys completed is provided in **Chapter 8: Ecology and Nature Conservation** along with a detailed National Vegetation Classification (NVC) habitat plan which has been used to inform the assessment of GWDTEs. GWDTEs across the Proposed Development are illustrated in **Volume 3, Figure 10.7**.

10.4.20 **Volume 5**, **Appendix 10.3: GWDTE Assessment** provides a summary of the GWDTEs within Section A, and concludes that one habitat is assessed to be moderately groundwater dependent (M15 NVC habitat near Tower N84), and all other habitats areas are sustained by rainfall and waterlogging of soils, rather than by groundwater across Section A.

Surface Water Quality

10.4.21 Water quality is monitored by SEPA and classified annually in accordance with the requirements of the Water Framework Directive (WFD). **Table 10.10** provides summary details of the SEPA classifications reported in 2023 (the latest reporting cycle) across Section A. Smaller watercourses within the Study Area are not monitored by SEPA. Surface watercourses and waterbodies across the Proposed Development are illustrated in **Volume 3, Figure 10.2**.

Table 10.10: Surface Water Quality Across Section A

Name	SEPA ID	Waterbody	WFD status	Location / Description
Wick River	20037	River	Moderate	Draining southwest to northwest, the Proposed Development crosses Wick River at approximately 319412 E 950484 N.
Little River / Loop Burn	20647	River	Good	Running parallel to the Proposed Development and draining primarily south to north. The route crosses Loop Burn as it drains from Loch Stemster to Loch Rangag at approximately 318293 E 942053 N.
Burn of Latheronwheel	20046	River	Good	Located north of Latheronwheel, the Burn of Latheronwheel drains north to south. The route crosses the watercourse at approximately 317729 E 936926 N.
Burn of Houstry	20051	River	Good	Draining north to south, the overhead route crosses the Burn of Houstry northwest of Dunbeath at approximately 315374 E 932961 N.
Dunbeath Water	20048	River	Good	Draining northwest to southeast, the overhead route crosses Dunbeath Water at approximately 313967 E 931341 N.

Name	SEPA ID	Waterbody	WFD status	Location / Description
Berriedale Water	20053	River	Good	Draining northwest to southeast, the route crosses Berriedale Water at approximately 310860 E 923539 N.
Langwell Water	20054	River	Good	Draining west to east, the route crosses Langwell Water at approximately 309609 E 922277 N.
Ousdale Burn	20838	River	Good	Draining northwest to southeast, the route crosses Ousdale Burn at approximately 306094E 920446 N.
Caen Burn	20003	River	High	Draining south to north, the route crosses Caen Burn at approximately 301456 E 917939 N before it joins the River Helmsdale.
River Helmsdale – Kinbrace Burn to sea	20002	River	Good	Draining west to east, the route crosses River Helmsdale at approximately 301189 E 917488 N.
Loth Burn	20055	River	Moderate	Draining west to east, the route crosses the Loth Burn 4 times at 294264 E 914911 N, 293726 E 913936 N, 293493 E 913498 N, 292062 E 912400 N, northwest of Lothbeg.

Summary of Sensitive Water Environment Receptors

10.4.22 **Table 10.11** outlines the receptors within Section A identified as part of the baseline study, and their sensitivity based upon the criteria contained in **Table 10.2**.

Table 10.11: Sensitivity of Receptors within Section A

Receptor	Sensitivity	Reason for Sensitivity
Designated Sites/Sensitive Environment	High	Section A of the Proposed Development is hydrologically connected to designated receptors of local to regional scale which are of moderate to high environmental value.
Groundwater	High	Groundwater has been classified by SEPA as Good and vulnerability is classified as High and is therefore assessed to be of local scale and high environmental value.
Surface water	High	Surface water watercourses and surface water bodies have been classified by SEPA with Good overall status and several of the catchments have been designated as DWPA. Therefore, surface water is assessed to be of local scale and high environmental value.
Flood Risk to the Proposed Development and impacts to flood risk from the Proposed Development	Medium	Sensitivity is based on potential for increase in flood as a result of the Proposed Development. Minor floodplains have been identified adjacent to the larger watercourses crossed by the Proposed Development. Impacts to flooding and impacts from flooding are assessed to be of local scale and medium environmental value.
Drinking Water Protected Areas and Private Water Supplies	High	It has been confirmed that the Proposed Development crosses and lies within the catchments of DWPA's. Properties have been identified to be served by a PWS that are downgradient of the Proposed Development. Both public and private water supplies are assessed to be of local to regional scale and high environmental value.

Receptor	Sensitivity	Reason for Sensitivity
Groundwater Dependent Terrestrial Ecosystems	High	GWDTEs have been identified within 250 m of the Proposed Development. Anything within this distance with excavations greater than 1 m depth must be assessed as impacts on groundwater connectivity could impact the quality of the GWDTE.

Section B - Brora to Loch Buidhe

Hydrology

10.4.23 This section of the Proposed Development spans from Brora to Loch Buidhe. The Proposed Development travels over three catchments at this section which are listed below from north to south and are shown **in Volume 3, Figure 10.3: Surface Water Catchments**:

- Brora Coastal;
- River Brora; and
- River Fleet.

10.4.24 These catchments all travel southeasterly from the source of these principal watercourses into the North Sea down Scotland's Northeast coast. There are numerous tributaries (named and un-named) to these principal watercourses especially River Fleet catchment, with many significant watercourses feeding into the principal watercourse.

10.4.25 A review of OS 1:50,000 maps, aerial photography and hydrological site walkovers indicate that this section will feature approximately 35 watercourse crossings; ten of which are permanent and 25 are temporary. These are shown in more detail **Volume 5**, **Appendix 10.1: Schedule of Watercourse Crossings.**

10.4.26 There are two public water areas supplied by three surface water DWPAs within 1 km of Section B of the Proposed Development which are established below:

- Backies Water Treatment Works is supplied by:
  - Loch Lunndaidh (and Loch Horn)
- Londornoch Water Treatment Works is supplied by:
  - Loch Laoigh
  - Loch Lannsaidh

Private Water Supplies

10.4.27 Information from LOQs and THC have identified areas where there are PWS that are at risk of being impacted by the Proposed Development. This has indicated there are five PWS within 1 km of the Proposed Development and scoped into this assessment. However, the data does not prove the source location for some of the properties. The results from these surveys are compiled in **Table 10.12**. Private Water Supplies across the Proposed Development are shown in **Volume 3, Figure 10.6 (Confidential)**.

Table 10.12: PWS Within 1 km of Section B

Property	PWS NO.	PWS Type	Source Type	Location of supply	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
PWS 283 Torboll	PWS 35	Domestic	Surface Watercourse	270294, 898746	Potentially hydrologically connected to the Proposed Development as infrastructure lies within the hydrological catchment of the PWS; temporary access track located within the hydrological catchment.	Yes	THC
PWS Brae Cottage	PWS 36	Rented Property	Surface Watercourse	270197, 898622	Potentially hydrologically connected to the Proposed Development as infrastructure lies within the hydrological catchment of the PWS; temporary access track located within the hydrological catchment.	Yes	THC
PWS Carrol Farm	PWS 38	Domestic	Carrol Burn	284872, 906991	Potentially hydrologically connected to the Proposed Development as infrastructure lies within the hydrological catchment of the PWS; Towers N223-N224 and permanent access track located within the hydrological catchment.	Yes	THC
PWS Killen	PWS 43	Not Provided	Borehole	285558, 907084	Potentially hydrologically connected to the Proposed Development as the PWS is located within 250 m of excavations greater than 1 m in depth, in accordance with SEPA guidance.	Yes	THC

Property	PWS NO.	PWS Type	Source Type	Location of supply	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
PWS Torboll Farmhouse	PWS 48	Not Provided	Groundwater	275080, 899050	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC

Statutory Designated Sites and Sensitive Environments

10.4.28 The designated sites that have been scoped in for this assessment for Section B of the Proposed Development are listed in **Table 10.13**. Designated sites across the Proposed Development are illustrated in **Volume 3, Figure 10.9.**

Table 10.13: Section B Designated Sites

Designated Site/ Sensitive Environment	Distance to Proposed Development (m)	Connectivity to Proposed Development
Strath Carnaig and Strath Fleet Moors SSSI and SPA	0	Yes. Towers N268-N297 and access tracks are places within this SSSI/SPA.
Strath Fleet SSSI	0	Yes. Tower N263 and temporary access track placed on top of this designated site.
Carrol Rock SSSI	64	No. hydrologically disconnected as hydrologically upstream.
Mound Alderwoods SSSI, SAC	10	Yes. hydrologically connected Tower N266 18 m from River fleet that is connected to this SSSI, SAC 600 m upstream. Temporary access track is also proposed 10 m south of this designated site.
Dornoch Firth and Loch Fleet SPA, Ramsar	241	Yes. Hydrologically connected, Tower N266 18 m from River Fleet (tributary to Loch Fleet) 3.66 km upstream
Torboll Woods SSSI	566	Yes. Hydrologically connected, watercourse (Abhainn an t-Stratha Charnaig) crossed by permanent access track 650 m upstream

Flood Risk

10.4.29 Section B was determined to be at a localised risk from flooding from fluvial and surface water sources as shown in **Table 10.14**. Flood Risk across the Proposed Development is illustrated in **Volume 3, Figure 10.10**.

Table 10.14: Sources of Flood Risk Across Section B

Flooding Source	Potential Flood Risk to the Proposed Development	Justification
Coastal flooding	No	The SEPA Flood Map shows that the Proposed Development is not at risk of tidal or coastal flooding.
Fluvial flooding	Yes (localised)	The SEPA Flood Map shows that fluvial flood extents associated with the watercourses crossed by the Proposed Development are localised in extent and do not extend significantly beyond the watercourses. Areas of high risk are crossed by the Proposed Development as detailed in **Table 10.15**. With appropriate design and embedded mitigation, this is not considered a development constraint.
Surface water flooding	Yes (localised)	SEPA flood maps indicate that the majority of the Proposed Development is not at risk from surface water flooding, however, small discrete areas of flooding are shown which are associated with small topographic lows. Areas with high likelihood of surface water flooding are detailed in **Table 10.15.** Surface water flooding is not considered to be a design constraint and potential effects can be mitigated by drainage measures detailed in **Table 10.5**.
Groundwater flooding	No	The SEPA groundwater flood map illustrates that the Proposed Development is not considered at risk from potential groundwater flooding.
Flood Defence Breach (failure)	No	The Proposed Development does not benefit from the protection of any flood defences.
Flooding from Artificial Drainage	No	The Proposed Development is located remote from any artificial drainage systems.
Flooding due to infrastructure failure	No	SEPA has produced reservoir inundation maps for those sites currently regulated under the Reservoirs Act 1975. Review of these maps indicates no risks related to reservoir breach scenarios near the Proposed Development.

10.4.30 Watercourses where there is a high likelihood of flooding from these sources and that are crossed by this section of the development are shown in **Table 10.15**.

Table 10.15: Flood Risk Across Section B

Type of Flooding	Likelihood	Water Body Name(s)
Fluvial	High	• Clynemilton Burn; • An Dubh-lochan; • Loch Brora (south basin); • River Brora; • Carol Burn; • Golspie Burn; • Morvich Burn; • River Fleet (and tributaries); • Abhainn t Sratha Carnaig; and • Loch Buidhe (and tributaries).
Surface water	High	• An Dubh-lochan;

Type of Flooding	Likelihood	Water Body Name(s)
		• Loch an Tubairnaich; • Loch Brora (south basin); • Loch Horn; • Golspie Burn; • Morvich Burn; • River Fleet (and tributaries); • Loch Ruagaidh; • Abhainn t Sratha Carnaig; • Loch na Feannaig; and • Loch Buidhe.

10.4.31 Due to the nature of flood likelihood being 'high' at the noted sections, the associated sensitivity for the Proposed Development (including tower locations) is High.

Hydrogeology

10.4.32 The BGS GeoIndex Viewer indicates the following hydrogeology across Section B:

- Middle Old Red Sandstone (Undifferentiated) - classified as a moderately productive bedrock aquifer, comprised of sandstones, mudstones, conglomerates and interbedded lavas which yield small amounts of groundwater locally.
- Lower Old Red Sandstone - classified as a multi-layered, moderately productive aquifer where flow is virtually all through fractures and other discontinuities.
- Morar Group – classified as a low productivity bedrock aquifer, which yields small amounts of groundwater in near surface weathered zones and secondary fractures. Flow is predominantly through fractures and other discontinuities.
- Lewisian Complex – classified as a low productivity bedrock aquifer where groundwater is only present in near surface weathered zone and secondary fractures and flow is predominantly through fractures and other discontinuities.

10.4.33 There are two groundwater bodies underlying Section B of the Proposed Development: Northern Highlands (ID: 150701), and Brora (ID: 150703), which both have a SEPA overall condition classification of 'Good' as of 2023. The Northern Highlands groundwater body has an aquifer typology of Precambrian North and has low or very low productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Brora groundwater body is Old Red Sandstone North and has low to high aquifer productivity. It is overlain by moderate to low permeability strata which is several metres thick.

10.4.34 The BGS groundwater vulnerability (Scotland) map shows that parts of Section B of the Proposed Development are defined as class 5 which means it is vulnerable to most pollutants, with rapid impact in many scenarios. The remainder of Section B is class 4 which is defined as vulnerable to those pollutants not readily absorbed or transformed.

10.4.35 As a result of the receptor's 'Good' overall status and groundwater vulnerability, groundwater is considered to be of High sensitivity in Section B of the Proposed Development.

Groundwater Dependent Terrestrial Ecosystems

10.4.36 In accordance with SEPA guidance and their Scoping Response an assessment of GWDTE has been undertaken and is presented as **Volume 5, Appendix 10.3: GWDTE Assessment**. A summary of the habitat

surveys completed is provided in **Chapter 8: Ecology and Nature Conservation** along with a detailed National Vegetation Classification (NVC) habitat plan which has been used to inform the assessment of GWDTEs. GWDTEs across the Proposed Development are illustrated in **Volume 3, Figure 10.7.**

10.4.37 **Volume 5**, **Appendix 10.3: GWDTE Assessment** provides a summary of the GWDTEs within Section B, and concludes that one habitat is assessed to be moderately groundwater dependent (M15 NVC habitat between Towers N212 and N213), and all other habitats areas are sustained by rainfall and waterlogging of soils, rather than by groundwater across Section B.

Surface Water Quality

10.4.38 Water quality is monitored by SEPA and classified annually in accordance with the requirements of the WFD. **Table 10.16** provides summary details of the SEPA classifications reported in 2023 (the latest reporting cycle) across Section B. Smaller watercourses within the Study Area are not monitored by SEPA. Surface watercourses and waterbodies across the Proposed Development are illustrated in **Volume 3, Figure 10.2**.

Table 10.16: Surface Water Quality Across Section B

Name	SEPA ID	Waterbody	WFD status	Location / Description
Loch Brora (South Basin)	100092	Loch	Good	The Proposed Development crosses the south basin of Loch Brora at approximately 285342 E 907240 N.
River Brora – sea to Loch Brora	20057	River	Good	The Proposed Development is positioned approximately 200 m north of the River Brora, crossing Loch Brora which drains to River Brora.
Carrol Burn	20061	River	Good	Draining west to east the Proposed Development crosses the Carrol Burn at approximately 284625 E 907129 N.
Golspie Burn	20056	River	Good	Draining northwest to southeast, the Proposed Development crosses Golspie Burn at approximately 279504 E 904423 N.
Morvich Burn	20071	River	Good	Draining approximately north to south, discharging in the River Fleet. The Proposed Development crosses the Morvich Burn twice at approximately 277565 E 902706 N and 275805 E 902147 N.
River Fleet – Loch Fleet to Rogart	23390	River	Moderate	Drains northwest to southeast, the Proposed Development crosses the River Fleet at approximately 273981 E 900713 N.
Abhainn an t-sratha Charnaig	20072	River	Good	Draining from west to east from Loch Buidhe, the watercourse runs parallel to the Proposed Development for approximately 4.8 km before the Proposed Development crosses at approximately 272200 E 898443 N.
Loch Buidhe	100096	Loch	High	Located approximately 200 m north and downhill of the Proposed Development at its nearest point (approximately 267112 E 898156 N) Loch Buidhe is located over 7.5 km northeast of Bonar Bridge.

Summary of Sensitive Water Environment Receptors

10.4.39 **Table 10.17** outlines the receptors within Section B identified as part of the baseline study, and their sensitivity based upon the criteria contained in **Table 10.2.**

Table 10.17: Sensitivity of Receptors within Section B

Receptor	Sensitivity	Reason for Sensitivity
Designated Sites/ Sensitive Environment	High	Section B of the Proposed Development is Hydrologically connected to areas that are protected and rely on the water environment.
Groundwater	High	Groundwater has been classified by SEPA as Good and vulnerability is classified as High.
Surface water	High	Surface water watercourses and surface water bodies have been classified by SEPA with Good overall status and several of the catchments have been designated as DWPA.
Flood Risk to the Proposed Development and impacts to flood risk from the Proposed Development.	Medium	Sensitivity is based on potential for increase in flood as a result of the Proposed Development. Minor floodplains have been identified adjacent to the larger watercourses crossed by the Proposed Development. Impacts to flooding and impacts from flooding are assessed to be of local scale and medium environmental value.
Drinking Water Protected Areas and Private Water Supplies	High	It has been confirmed that the Proposed Development crosses and lies within the catchments of DWPA's. Properties have been identified to be served by a PWS that are downgradient of the Proposed Development.
Groundwater Dependent Terrestrial Ecosystems	High	GWDTEs have been identified within 250 m of the Proposed Development. Anything within this distance with excavations greater than 1 m depth must be assessed as impacts on groundwater connectivity could impact the quality of the GWDTE.

Section C - Loch Buidhe to Dounie

Hydrology

10.4.40 This section of the Proposed Development travels from Loch Buidhe to Dounie. Section C of the Proposed Development travels over five catchments which are listed below from north to south and are shown in **Volume 3**, **Figure 10.3: Surface Water Catchments**:

- River Fleet;
- Dornoch Coastal;
- River Shin;
- Dornoch Firth; and
- River Carron.

10.4.41 The River Fleet travels southeasterly from its source into the North Sea at Loch Fleet and has multiple significant watercourses feeding into it. The rest of the catchments across Section C feed into the Dornoch Firth

from their source which leads into the North Sea. There are numerous tributaries (named and un-named) to these principal watercourses.

10.4.42 A review of OS 1:50,000 maps, aerial photography and hydrology site walkovers indicate that this section will cross approximately eight proposed watercourse crossings, three are permanent and five are temporary, this is shown in more detail in **Volume 5**, **Appendix 10.1: Schedule of Watercourse Crossings**.

10.4.43 There are no surface water DWPAs (rivers or lochs) within 1 km or have hydrological connection to Section C of the Proposed Development.

Private Water Supplies

10.4.44 Information from LOQs and THC have identified areas where there are PWS that are at risk of being impacted by the Proposed Development. This has indicated there are eight PWS within 1 km of the Proposed Development and are assumed to be hydrologically connected through pathways within water or connected through being downgradient off the Proposed Development. However, the data does not prove the source location for some of the properties. The results from these surveys are compiled in **Table 10.18.** Private Water Supplies across the Proposed Development are shown in **Volume 3, Figure 10.6 (Confidential).**

Table 10.18: PWS within 1 km of Section C

Property	PWS NO.	PWS Type	Source Type	Location of supply	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
PWS Creide	PWS 3	Domestic	Borehole	Confidential	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	LOQ
PWS Oak Bank	PWS 12	Domestic	Borehole	Confidential	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	LOQ
PWS Croftwards	PWS 39	Domestic	Tributary of Poll na Gead-iasg	254878, 891456	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC
PWS Helendale	PWS 41	Domestic	Borehole	256691, 896731	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located	No	THC

Property	PWS NO.	PWS Type	Source Type	Location of supply	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
					within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.		
PWS Inverhouse	PWS 42	Domestic	Tributary of the Kyle of Sutherland	256777, 896432	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC
PWS Rowan House	PWS 45	Unknown	Borehole	256658, 896522	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC
PWS Seangan	PWS 46	Domestic	Tributary of Allt nan Seangan	256532, 896662	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC
PWS Sleasdaraidh	PWS 47	Domestic	Spring	264473, 896616	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC

Statutory Designated Sites and Sensitive Environments

10.4.45 The designated sites that have been scoped in for this assessment for Section C of the Proposed Development are shown in **Table 10.19**. Designated sites across the Proposed Development are illustrated in **Volume 3, Figure 10.9**.

Table 10.19: Section C Designated Sites

Designated Site/ Sensitive Environment	Distance to Proposed Development (m)	Connectivity to Proposed Development
Strath Carnaig and Strath Fleet Moors SSSI and SPA	0	Yes. Towers S1-S4 and access tracks are places within this SSSI/SPA.
Kyle of Sutherland Marshes SSSI	0	Assumed to be hydrologically connected. Tower S23 placed approximately 100 m from SSSI. (special arrangements section)
River Oykel SAC	0	Receptor is connected as it is downgradient of Proposed Development and assumed to be hydrologically connected. Tower S23 placed approximately 275 m from the SAC. The receptor is downgradient of Tower S24 which is placed approximately 100 m away.

Flood Risk

10.4.46 Section C was determined to be at a localised risk from flooding from pluvial, surface water, and coastal sources as shown in **Table 10.20.** Flood Risk across the Proposed Development is illustrated in **Volume 3, Figure 10.10.**

Table 10.20: Sources of Flood Risk Across Section C

Flooding Source	Potential Flood Risk to the Proposed Development	Justification
Coastal flooding	Yes (localised)	SEPA flood mapping confirms that the Proposed Development is remote from areas at risk from tidal or coastal flooding except at the Dornoch Firth, where the proposed OHL route crosses an area with High Likelihood of coastal flooding highlighted in **Table 10.21**. However, no tower locations are placed within this area of coastal flooding as it is localised within the banks of the estuary. Therefore, coastal flooding is not considered a development constraint.
Fluvial flooding	Yes (localised)	The SEPA Flood Map shows that fluvial flood extents associated with the watercourses crossed by the Proposed Development are localised in extent and do not extend significantly beyond the watercourses. There are, however, areas of high risk and these are crossed by the Proposed Development as detailed in **Table 10.21**. With appropriate design and embedded mitigation, this is not considered a development constraint.
Surface water flooding	Yes (localised)	SEPA flood maps indicate that the majority of the Proposed Development is not at risk from surface water flooding, however, small discrete areas with high likelihood are shown which are associated with small topographic lows. Areas with high likelihood of surface water flooding are detailed in **Table 10.21**. Surface water flooding is not considered to be a design constraint and potential effects can be mitigated by drainage measures detailed in **Table 10.5**.
Groundwater flooding	No	From a review of SEPA groundwater flood mapping, it is considered that the Proposed Development is not at risk from potential groundwater flooding.

Flooding Source	Potential Flood Risk to the Proposed Development	Justification
Flood Defence Breach (failure)	No	The Proposed Development does not benefit from the protection of any flood defences.
Flooding from Artificial Drainage	No	The Proposed Development is located remote from any artificial drainage systems.
Flooding due to infrastructure failure	No	SEPA has produced reservoir inundation maps for those sites currently regulated under the Reservoirs Act 1975. Review of these maps indicates no risks related to reservoir breach scenarios near the Proposed Development.

10.4.47 Watercourses where there is a high likelihood of flooding which are also crossed by this section of the Proposed Development are shown in **Table 10.21.**

Table 10.21: Flood Risk Across Section C

Type of Flooding	Likelihood	Water Body Name(s)
Fluvial	High	• Allt Garbh-airigh; • River Evelix; • Henman's Burn; • Dornoch Firth Estuary; and • Culrain Burn.
Surface water	High	• Loch Buidhe; • Loch Leisgein; • Dornoch Firth Estuary; and • Culrain Burn.
Coastal	High	• Dornoch Firth Estuary.

Hydrogeology

10.4.48 The BGS GeoIndex indicates that Section C of the Proposed Development is underlain by the Morar Group bedrock aquifer. This is classified as a low productivity aquifer with small amounts of groundwater in near surface weathered zone and secondary fractures.

10.4.49 There is one groundwater body underlying Section C of the Proposed Development: Northern Highlands (ID: 150701), which has a SEPA overall condition classification of 'Good' as of 2023. The aquifer typology is Precambrian North and it has a low or very low productivity. It is overlain by moderate-low permeability strata which is several metres thick.

10.4.50 The BGS groundwater vulnerability (Scotland) map shows that parts of Section C of the Proposed Development are defined as class 5 which means it is vulnerable to most pollutants, with rapid impact in many scenarios. The remainder of Section C is class 4 which is defined as vulnerable to those pollutants not readily absorbed or transformed.

10.4.51 As a result of the receptor's 'Good' overall status and groundwater vulnerability, groundwater is considered to be of High sensitivity in Section C of the Proposed Development.

Groundwater Dependent Terrestrial Ecosystems

10.4.52 In accordance with SEPA guidance and their Scoping Response an assessment of GWDTE has been undertaken and is presented as **Volume 5**, **Appendix 10.3: GWDTE Assessment**. A summary of the habitat surveys completed is provided in **Chapter 8: Ecology and Nature Conservation** along with a detailed National Vegetation Classification (NVC) habitat plan which has been used to inform the assessment of GWDTEs. GWDTEs across the Proposed Development are illustrated in **Volume 3, Figure 10.7.**

10.4.53 **Volume 5**, **Appendix 10.3: GWDTE Assessment** provides a summary of the GWDTEs within Section C, and concludes that areas of potential GWDTE are sustained by rainfall and waterlogging of soils, rather than by groundwater across Section C.

Surface Water Quality

10.4.54 Water quality is monitored by SEPA and classified annually in accordance with the requirements of the WFD. **Table 10.22** provides summary details of the SEPA classifications reported in 2023 (the latest reporting cycle) across Section C. Smaller watercourses within the Study Area are not monitored by SEPA. Surface watercourses and waterbodies across the Proposed Development are illustrated in **Volume 3, Figure 10.2.**

Table 10.22: Surface Water Quality Across Section C

Name	SEPA ID	Waterbody	WFD status	Location / Description
Allt Garbh-airigh	20073	River	Good	Located 640 m north downhill of the Proposed Development at approximately 264394 E 898354 N at its nearest point. The Allt Garbh-airigh drains west to east into Loch Buidhe.
River Evelix	20079	River	Good	Draining north to south, the Proposed Development crosses the River Evelix at approximately 262630 E 897200 N.
River Shin	20093	River	Good	Located 800 m north and upstream of the Proposed Development, the River Shin flows into the Dornoch Firth at approximately 257329 E 896863 N, its nearest point to the development.
Dornoch Firth	200165	Estuary	Good	The Dornoch Firth is a large waterbody, with the majority of the basin lying to the east of the Development. The Proposed Development crosses the Dornoch Firth at approximately 257130 E 896090 N.
Culrain Burn	20085	River	Good	Draining northwest to southeast into the Dornoch Firth, the Proposed Development crosses the Culrain Burn at approximately 256294 E 895066 N.

Summary of Sensitive Water Environment Receptors

10.4.55 **Table 10.23** outlines the receptors within Section C identified as part of the baseline study, and their sensitivity based upon the criteria contained in **Table 10.23**. Designated sites across the Proposed Development are illustrated in **Volume 3, Figure 10.9**.

Table 10.23: Sensitivity of Receptors within Section C

Receptor	Sensitivity	Reason for Sensitivity
Designated Sites/Sensitive Environment	High	Section C of the Proposed Development is assumed to be hydrologically connected to areas that are protected and rely on the water environment.
Groundwater	High	Groundwater has been classified by SEPA as Good and vulnerability is classified as High.
Surface water	High	Surface water watercourses and surface water bodies have been classified by SEPA with Good overall status and several of the catchments have been designated as DWPA.
Flood Risk to the Proposed Development and impacts to flood risk from the Proposed Development	Medium	Sensitivity is based on potential for increase in flood as a result of the Proposed Development. Minor floodplains have been identified adjacent to the larger watercourses crossed by the Proposed Development. Impacts to flooding and impacts from flooding are assessed to be of local scale and medium environmental value.
Drinking Water Protected Areas and Private Water Supplies	High	Properties have been identified that are served by a PWS that are downgradient of the Proposed Development.
Groundwater Dependent Terrestrial Ecosystems	High	GWDTEs have been identified within 250 m of the Proposed Development. Anything within this distance with excavations greater than 1 m depth must be assessed as impacts on groundwater connectivity could impact the quality of the GWDTE.

Section D - Dounie to Near Strathpeffer

Hydrology

10.4.56 This section of the Proposed Development spans from Dounie to near Strathpeffer. The Proposed Development travels over five catchments at this section which are listed below from north to south and are shown in **Volume 3**, **Figure 10.3: Surface Water Catchments**:

- River Carron;
- Dornoch Coastal;
- River Alness;
- River Glass; and
- Cromarty Coastal.

10.4.57 The River Carron catchment travels from its source near the west coast, easterly into the Dornoch Firth on the east coast, making it a significant catchment which has a large number of tributaries. The Dornoch Coastal catchment has many watercourses that travel northerly into the Dornoch Firth at this section. The River Alness and River Glass catchments travel southeasterly from their source where they meet the Cromarty Firth, which the Cromarty Coastal catchment also feeds into. There are numerous tributaries (named and un-named) to these principal watercourses.

10.4.58 A review of OS 1:50,000 maps, aerial photography and hydrology site walkovers indicated that this section will feature approximately 37 watercourse crossings, four of which are temporary and 33 are permanent. These are shown in more detail in **Volume 5**, **Appendix 10.1: Schedule of Watercourse Crossings.**

10.4.59 Two surface water DWPAs are within 1 km of section D of the Proposed Development and are established below:

- River Glass (Cromarty Firth to Redburn intake) which supplies Newmore Water Treatment Works; and
- Wester Fearn Burn.

Private Water Supplies

10.4.60 Information from LOQs have identified areas where there are PWS that are at risk of being impacted by the Proposed Development. This has indicated there are 15 PWS within 1 km of the Proposed Development and hydrologically connected. However, the data does not prove the source location for some of the properties. The results from these surveys are compiled in **Table 10.24**. Private Water Supplies across the Proposed Development are shown in **Volume 3, Figure 10.6 (Confidential)**.

Table 10.24: PWS within 1 km of Section D.

Property	Property No.	PWS Type	Source Type	Location	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
PWS Fannyfield House	PWS 4	Domestic and Livestock	Shallow Surface Through Flow	Confidential	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment	No	LOQ
	PWS 4.2		Well	Confidential	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	LOQ
PWS Glaick Croft	PWS 5	Not Provided	Stream	Confidential	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	LOQ
PWS Trahenna	PWS 13	Domestic	Stream/Burn	Confidential	Deemed as not hydrologically	No	LOQ

Property	Property No.	PWS Type	Source Type	Location	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
					connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.		
PWS Milton Lodge	PWS 14	Holiday Let	Spring	Confidential	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	LOQ
PWS Boath Road - Ballavoulen	PWS 25	Domestic	Spring	257284, 874144	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC
PWS Eileanach	PWS 26	Domestic	Hill Loch	254829, 868596	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC
PWS Glenglass - West End	PWS 28	Domestic	Spring	256358, 868882	Deemed as not hydrologically connected to the Proposed Development as the	No	THC

Property	Property No.	PWS Type	Source Type	Location	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
					PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.		
PWS Kinloch Cottage	PWS 29	Holiday Let	Tributaries of the River Averon	244371, 875352 255409, 875397	Potentially hydrologically connected to the Proposed Development as infrastructure lies within the hydrological catchment of the PWS; permanent access track and Towers S87-S88 sited in the PWS hydrological catchment.	Yes	THC
PWS Novar – Strone	PWS 30	Holiday Let	Borehole	257800, 874600	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC
PWS Novar Ballavoulen Cottage	PWS 31	Regulated Supply	Spring	257284, 874144	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in	No	THC

Property	Property No.	PWS Type	Source Type	Location	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
					accordance with SEPA guidance.		
PWS Novar Tigh na Craig	PWS 32	Regulated Supply	Stream	255939, 868945	Potentially hydrologically connected to the Proposed Development as infrastructure lies within the hydrological catchment of the PWS; temporary access track located within the hydrological catchment.	Yes	THC
PWS Novar Westend Cottage	PWS 33	Regulated Supply	Spring	256308, 868873	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC
PWS Gruinards Farm	PWS 40	Holiday Let	Tributary of River Carron	254861, 890811	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC
PWS Plot 3 Culeave	PWS 44	Domestic	Tributary of Poll na Gead-iasg*	255233, 891390	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC

Statutory Designated Sites and Sensitive Environments

10.4.61 The designated sites and sensitive environments that have been scoped in for this assessment for Section D of the Proposed Development are shown in **Table 10.25.** Designated site across the Proposed Development are illustrated in **Volume 3, Figure 10.9.**

Table 10.25: Section D Designated Sites

Designated Site/ Sensitive Environment	Distance to Proposed Development (m)	Connectivity to Proposed Development
Allt nan Caorach SSSI	0	Yes, the receptor is connected to a watercourse that is downgradient of the Proposed Development. 90 m from Tower 116 which is above the river.
Wet Heath	0	Yes. Towers S94-S99 and Tower S111. The receptor is downgradient of Towers S128-S142 with a series of small watercourses feeding into the receptor. Also, within 1 km further south of Section D but hydrologically disconnected here.
Peat Bog	20	Yes, Tower S111 is located within 20 m if the receptor is and it is downgradient of the Proposed Development. The receptor is also downgradient of Tower S117. Receptor is also featured within 1 km further south of Section D but hydrologically disconnected here.

Flood Risk

10.4.62 Section D was determined to be at a localised risk of flooding from pluvial and surface water sources as shown in **Table 10.26**. Flood Risk across the Proposed Development is illustrated in **Volume 3, Figure 10.10**.

Table 10.26: Sources of Flood Risk Across Section D

Flooding Source	Potential Flood Risk to the Proposed Development	Justification
Coastal flooding	No	The SEPA Flood Map shows that the Proposed Development is not at risk of tidal or coastal flooding.
Fluvial flooding	Yes (localised)	The SEPA Flood Map shows that fluvial flood extents associated with the watercourses crossed by the Proposed Development are localised in extent and do not extend significantly beyond the watercourses. Areas of high risk are crossed by the Proposed Development as detailed in **Table 10.27**. With appropriate design and embedded mitigation, this is not considered a development constraint.
Surface water flooding	Yes (localised)	SEPA flood maps indicate that the majority of the Proposed Development is not at risk from surface water flooding, however, small discrete areas of flooding are shown which are associated with small topographic lows. Areas with high likelihood of surface water flooding are detailed in **Table 10.27**. Surface water flooding is not considered to be a design constraint and potential effects can be mitigated by drainage measures detailed in **Table 10.5**.
Groundwater flooding	No	The SEPA groundwater flood map illustrates that the Proposed Development is not considered at risk from potential groundwater flooding.

Flooding Source	Potential Flood Risk to the Proposed Development	Justification
Flood Defence Breach (failure)	No	The Proposed Development does not benefit from the protection of any flood defences.
Flooding from Artificial Drainage	No	The Proposed Development is located remote from any artificial drainage systems.
Flooding due to infrastructure failure	No	SEPA has produced reservoir inundation maps for those sites currently regulated under the Reservoirs Act 1975. Review of these maps indicates no risks related to reservoir breach scenarios near the Proposed Development.

10.4.63 Watercourses where there is a high or medium likelihood of flooding from these sources (as well as whether surface water floods) and that are crossed by this section of the development are shown in **Table 10.27.**

Table 10.27: Flood Risk Across Section D

Type of Flooding	Likelihood	Water Body Name(s)
Fluvial	High	• River Carron (and tributaries); • Allt Dounie; • Allt a Ghlinne; • Abhainn – a ‘ Choire Bhuig; • Allt Coir Bhenneit; • Allt Coire na Cloiche; • Abhain Glac an t-Seilich; • Allt Loch Bad a’ Bhàthaich; • Black Water (and tributaries); • Alness River (andtributaries); • Allt a’ Ghreaich; • Allt na Seasgaich; • Allt a’ Ghlinne (Glen Burn); • River Glass; • Allt nan Caorach (and tributaries); • River Skitheach (and tributaries);
Surface water	High	• Allt an Tartair (and tributaries); • Loch Morie; • Loch a Chaplaich; • Allt nan Caorach (and tributaries); • Loch Agoo; • Tiadh Allt;

Hydrogeology

10.4.64 The BGS GeoIndex Viewer indicates the following hydrogeology across Section B:

- Morar Group – classified as a low productivity bedrock aquifer, which yields small amounts of groundwater in near surface weathered zones and secondary fractures and flow is predominantly through fractures and other discontinuities.

- Lower Old Red Sandstone - classified as a multi-layered, moderately productive aquifer where flow is virtually all through fractures and other discontinuities.
- Loch Eil Group – classified as a low productive bedrock aquifer which yields small amounts of groundwater in the near surface weathered zone and secondary fractures and flow is virtually all through fractures and discontinuities.

10.4.65 There are two groundwater bodies underlying Section D of the Proposed Development: Northern Highlands (ID: 150701) and Invergordon (ID: 150679). Northern Highlands and Invergordon have a SEPA overall condition classification of 'Good' as of 2023. The Northern Highlands groundwater body has an aquifer typology of Precambrian North and has low or very low productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Invergordon groundwater body is Old Red Sandstone North and has low to high aquifer productivity. It is overlain by overlain by moderate to low permeability strata which is several metres thick.

10.4.66 The BGS groundwater vulnerability (Scotland) map shows that parts of Section D of the Proposed Development are defined as class 5 which means it is vulnerable to most pollutants, with rapid impact in many scenarios. The remainder of Section D is class 4 which is defined as vulnerable to those pollutants not readily absorbed or transformed.

10.4.67 As a result of the receptor's 'Good' overall status and groundwater vulnerability, groundwater is considered to be of High sensitivity in Section D of the Proposed Development.

Groundwater Dependent Terrestrial Ecosystems

10.4.68 In accordance with SEPA guidance and their Scoping Response an assessment of GWDTE has been undertaken and is presented as **Volume 5, Appendix 10.3: GWDTE Assessment**. A summary of the habitat surveys completed is provided in **Chapter 8: Ecology and Nature Conservation** along with a detailed National Vegetation Classification (NVC) habitat plan which has been used to inform the assessment of GWDTEs. GWDTEs across the Proposed Development are illustrated in **Volume 3, Figure 10.7.**

10.4.69 **Volume 5**, **Appendix 10.3: GWDTE Assessment** provides a summary of the GWDTES within Section D, and concludes that areas of potential GWDTE are sustained by rainfall and waterlogging of soils, rather than by groundwater across Section D.

Surface Water Quality

10.4.70 Water quality is monitored by SEPA and classified annually in accordance with the requirements of the WFD. **Table 10.28** provides summary details of the SEPA classifications reported in 2023 (the latest reporting cycle) across Section D. Smaller watercourses within the Study Area are not monitored by SEPA. Surface watercourses and waterbodies across the Proposed Development are illustrated in **Volume 3, Figure 10.2.**

Table 10.28: Surface Water Quality Across Section D

Name	SEPA ID	Waterbody	WFD status	Location / Description
River Carron	20130	River	Good	Draining west to east, the River Carron is crossed by the overhead route at approximately 255580 E 890879 N
Allt a Ghlinne	20133	River	Good	Draining southeast to north into the River Carron, the Allt a Ghlinne is located approximately 900 m west of

Name	SEPA ID	Waterbody	WFD status	Location / Description
				the overhead route at 254730 E 891008 N.
Allt Eiteachan	20086	River	Good	Draining roughly southwest to northeast, discharging to Dornoch Firth, the Proposed Development crosses Allt Eiteachan at approximately 255564 E 887831 N.
Wester Fearn Burn	20087	River	Moderate	Draining southwest to northeast, the Proposed Development crosses Wester Fearn burn at approximately 257198 E 883800 N.
Black Water	20159	River	Good	Draining north to south, the Proposed Development crosses Black Water at approximately 256094 E 880500 N where it runs parallel to the Black Water for 2 km before it turns southeast.
Alness River – Strone to Loch Morie	20157	River	Good	Draining west to east from Loch Morie, the Proposed Development crosses the Alness River at approximately 255348 E 875350 N
Loch Morie	100111	Loch	High	Located 700 m west and upstream of the overhead route, Loch Morie is at approximately 254658 E 875206 N at its nearest point.
Allt na Seasgaich	20160	River	Good	Draining south to north, discharging to Alness River, the Allt na Seasgaich runs approximately 300 m parallel (257538 E 871917 N at its nearest point) to the Proposed Development for 4.5 km within the Study Area.
River Glass	20162	River	Good	Draining from Loch Glass which is northwest of the Proposed Development, the River Glass runs to Inner Cromarty Firth to the southeast. The Proposed Development crosses River Glass at approximately 255818 E 868396 N.
Allt nan Caorach to confluence with River Glass	23901	River	Moderate	Draining from west to east, the Allt nan Caorach is crossed by the overhead route at approximately 255662 E 868059 N.
River Skitheach	20146	River	Moderate	The Proposed Development crosses the River Skitheach at approximately 249629 E 862178 N after which the watercourse drains to the northeast parallel to the route for approximately 6 km.

Summary of Sensitive Water Environment Receptors

10.4.71 **Table 10.29** outlines the receptors within Section D identified as part of the baseline study, and their sensitivity based upon the criteria contained in **Table 10.2.**

Table 10.29: Sensitivity of Receptors within Section D

Receptor	Sensitivity	Reason for Sensitivity
Designated Sites/Sensitive Environment	High	Section D of the Proposed Development is Hydrologically connected to areas that are protected and rely on the water environment.
Groundwater	High	Groundwater has been classified by SEPA as Good and vulnerability is classified as High.
Surface water	High	Surface water watercourses and surface water bodies have been classified by SEPA with Good overall status and several of the catchments have been designated as DWPA.
Flood Risk to the Proposed Development and impacts to flood risk from the Proposed Development	Medium	Sensitivity is based on potential for increase in flood as a result of the Proposed Development. Minor floodplains have been identified adjacent to the larger watercourses crossed by the Proposed Development. Impacts to flooding and impacts from flooding are assessed to be of local scale and medium environmental value.
Drinking Water Protected Areas and Private Water Supplies	High	It has been confirmed that the Proposed Development crosses and lies within the catchments of DWPA's. Properties have been identified to be served by a PWS that are downgradient of the Proposed Development.
Groundwater Dependent Terrestrial Ecosystems	High	GWDTEs have been identified within 250 m of the Proposed Development. Anything within this distance with excavations greater than 1 m depth must be assessed as impacts on groundwater connectivity could impact the quality of the GWDTE.

Section E - Near Strathpeffer to Beauly

Hydrology

10.4.72 This section of the Proposed Development spans from near Strathpeffer to Beauly. The Proposed Development travels over three catchments at this section which are listed below from north to south and are shown in **Volume 3**, **Figure 10.3: Surface Water Catchments**:

- Cromarty Coastal;
- River Conon; and
- River Beauly.

10.4.73 The Cromarty coastal is the catchment most associated with the Cromarty Firth, with many tributaries feeding into this. The River Conon catchment features a large number of watercourses, which all feed into the River Conon, travelling easterly, eventually feeding into the Dornoch Firth. The River Beauly travels from its source northeasterly into the Beauly Firth near Inverness. There are numerous tributaries (named and un-named) to these principal watercourses.

10.4.74 A review of OS 1:50,000 maps, aerial photography and hydrology site walkovers indicate that this section will feature approximately 19 watercourse crossings, five of which are temporary and 14 are permanent. These are shown in more detail in **Volume 5**, **Appendix 10.1: Schedule of Watercourse Crossings**.

10.4.75 There are no surface water DWPAs (rivers or lochs) within 1 km or in significant hydrological connection to Section E of the Proposed Development.

Private Water Supplies

10.4.76 Information from THC and LOQs have identified areas where there are PWS that are at risk of being impacted by the Proposed Development. This has indicated there are 19 PWS within 1 km of the Proposed Development and hydrologically connected. However, the data does not prove the source location for some of the properties. The results from these surveys are compiled in **Table 10.30**. Private Water Supplies across the Proposed Development are shown in **Volume 3, Figure 10.6 (Confidential)**.

Table 10.30: PWS within 1 km of Section E

Property Name	PWS No.	PWS Type	Source Type	Location of supply	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
PWS Ardochy	PWS 2.1	Domestic, Commercial (Holiday Let) and Livestock	Surface water (Tributary of Breakachy Burn)	Confidential	Potentially hydrologically connected to the Proposed Development as infrastructure lies within the hydrological catchment of the PWS; permanent access track and Towers S225-S226 located within the PWS hydrological catchment.	Yes	LOQ
	PWS 2.2		Shallow Surface Flow Through	Confidential	Potentially hydrologically connected to the Proposed Development as infrastructure lies within the hydrological catchment of the PWS; permanent access track located within the hydrological catchment.	Yes	LOQ

Property Name	PWS No.	PWS Type	Source Type	Location of supply	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
PWS Cluanie Farm	PWS 7	Not provided	Well	247027, 844095	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC and LOQ
PWS Darach Brae	PWS 8	Not Provided	Borehole	Confidential	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	LOQ
PWS Mains of Aigas	PWS 9	Domestic, Holiday Let	Shallow Surface Through Flow	246444, 842190	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC and LOQ
PWS Breakachy Farm	PWS 10	Domestic, Holiday Let/Hotel and Livestock	Spring	245700, 844400	Deemed as not hydrologically connected to the Proposed Development as the PWS is not	No	LOQ and THC

Property Name	PWS No.	PWS Type	Source Type	Location of supply	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
					located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.		
PWS Wester Kinellan	PWS 11	Domestic	Borehole	Confidential	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	LOQ
PWS Aigas Power Station	PWS 17	Power Station	River Beauly	247447, 843674	Potentially hydrologically connected to the Proposed Development as infrastructure lies within the hydrological catchment of the PWS; permanent access track and Towers S227-S232 located within the PWS hydrological catchment.	Yes	THC
PWS Farley	PWS 18	Domestic	Stream	246829, 845386	Deemed as not hydrologically connected to the Proposed Development as	No	THC

Property Name	PWS No.	PWS Type	Source Type	Location of supply	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
					no infrastructure lies within the PWS hydrological catchment.		
PWS Cruenassie	PWS 19	Domestic	Tributary of Breakachy Burn	246872, 844657	Potentially hydrologically connected to the Proposed Development as infrastructure lies within the hydrological catchment of the PWS; permanent access track, temporary access track and Towers S223-S224 located within the PWS hydrological catchment.	Yes	THC
PWS Culour of Breakachy	PWS 20	Domestic	Spring	246100, 844000	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC
PWS Log House	PWS 21	Domestic	Tributary of Breakachy Burn	246872, 844657	Potentially hydrologically connected to the Proposed Development as infrastructure lies within the hydrological catchment of the	Yes	THC

Property Name	PWS No.	PWS Type	Source Type	Location of supply	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
					PWS; permanent access track, temporary access track and Towers S223-S224 located within the hydrological catchment.		
PWS Moulnaceap	PWS 22	Holiday Let	Surface Run Off	246231, 842608	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC
PWS Wester Cruenassie	PWS 23	Domestic	Spring	246624, 844335	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC
PWS Auchmore	PWS 24	Domestic	Stream	249677, 850777	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC

Property Name	PWS No.	PWS Type	Source Type	Location of supply	Potentially Hydrologically Connected to the Proposed Development	Mitigation Required ?	Source
PWS Fairburn Muirton Mains	PWS 27	Domestic	Stream	255165, 868550	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC
PWS Orrin Power Station	PWS 34	Commercial	Loch Achonachie	243584, 854202	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC
PWS Tigh-Na-Laggan	PWS 49	Domestic	Tributaries of the River Beauly	246435, 842072	Deemed as not hydrologically connected to the Proposed Development as no infrastructure lies within the PWS hydrological catchment.	No	THC
PWS Kinellan-New House	PWS 50	Domestic	Borehole	247148, 857310	Deemed as not hydrologically connected to the Proposed Development as the PWS is not located within 100 m of excavations of less than 1 m in depth or within 250 m of excavations greater than 1 m in depth; in accordance with SEPA guidance.	No	THC

Statutory Designated Sites and Sensitive Environments

10.4.77 The designated sites and sensitive environments scoped in for this assessment for Section E of the Proposed Development are shown in **Table 10.31**. Designated sites across the Proposed Development are illustrated in **Volume 3, Figure 10.9.**

Table 10.31: Section E Designated Sites

Designated Site/ Sensitive Environment	Distance to Proposed Development	Connectivity to Proposed Development
Peat Bog	0	Yes. Tower S162 is placed within this site.
Wet Heath	0	Yes, Towers S161-S162 are placed within this.
Swamp	50	Yes, receptor is downgradient of the Proposed Development. This occurs at Towers S162-S163, S165 and special arrangements area. Also, within 1 km further south of Section E but hydrologically disconnected here.
Wet Grassland	50	Yes, the receptor is downgradient of the Proposed Development. This occurs at Towers S164-S165. Also, within 1 km further south of Section E but hydrologically disconnected here.
Wet Grassland	10	Yes. Tower S175 is located within 10 m of the receptor and the receptor is downgradient of the Proposed Development. Tower S177 is 50 m from the receptor and the receptor is downgradient of the Proposed Development. Towers S191-S192 and S195 are placed on top of this as well as the special arrangements section. Tower S227 is 130 m from this wetland and the receptor is downgradient of this tower. Also, more wet grassland further at other parts in the Proposed Development but hydrologically disconnected.
Wet Heath	13	Yes. Tower S187 hydrologically connected as 13 m from watercourse that leads to this wetland. Tower S191 is 20 m from watercourse that leads to designated site. Tower S194 is 25 m from watercourse that leads to designated site. Towers S196, S201, S202, S220, S223-S224 and associated permanent access track is placed on top of this wetland. There are other occurrences of this wetland in Section E, however, they are hydrologically disconnected or the receptor is upgradient from the Proposed Development.
Peat Bog	35	Yes, the receptor is downgradient from Tower S225 and associated permanent access track. Tower S228 special arrangement section is on top of this wetland.
Springs, flushes and seepages	100	No, receptor is upgradient from the Proposed Development
Lower River Conon SSSI	388	Yes. Hydrologically connected. Tower S174 is 37 m from Black Water tributary.
Wet Woodland (Lower River Conon SSSI)	500	No, wetland is located upstream from Proposed Development

Flood Risk

10.4.78 Section E was determined to have a localised risk of flooding from fluvial and surface water sources as shown in **Table 10.32.** Flood Risk across the Proposed Development is illustrated in **Volume 3, Figure 10.10.**

Table 10.32: Sources of Flood Risk Across Section E

Flooding Source	Potential Flood Risk to the Proposed Development	Justification
Coastal flooding	No	The SEPA Flood Map shows that the Proposed Development is not at risk of tidal or coastal flooding.
Fluvial flooding	Yes (localised)	The SEPA Flood Map shows that fluvial flood extents associated with the watercourses crossed by the Proposed Development are localised in extent and do not extend significantly beyond the watercourses. Areas of high risk are crossed by the Proposed Development as detailed in **Table 10.33**. With appropriate design and embedded mitigation, this is not considered a development constraint.
Surface water flooding	Yes (localised)	SEPA flood maps indicate that the majority of the Proposed Development is not at risk from surface water flooding, however, small discrete areas of flooding are shown which are associated with small topographic lows. Areas with high likelihood of surface water flooding are detailed in **Table 10.33**. Surface water flooding is not considered to be a design constraint, and potential effects can be mitigated by drainage measures detailed in **Table 10.5**.
Groundwater flooding	No	The SEPA groundwater flood map illustrates that the Proposed Development is not considered at risk from potential groundwater flooding.
Flood Defence Breach (failure)	No	The Proposed Development does not benefit from the protection of any flood defences.
Flooding from Artificial Drainage	No	The Proposed Development is located remote from any artificial drainage systems.
Flooding due to infrastructure failure	No	SEPA has produced reservoir inundation maps for those sites currently regulated under the Reservoirs Act 1975. Review of these maps indicates no risks related to reservoir breach scenarios near the Proposed Development.

10.4.79 Watercourses where there is a high likelihood of flooding from these sources (as well as whether surface water floods) and that are crossed by this section of the development is shown in **Table 10.33**.

Table 10.33: Flood Risk Across Section E

Type of Flooding	Likelihood	Water Body Name(s)
Fluvial	High	• Peffery Burn/ River Peffery; • An Dubh-lochan; • Loch na Crann; • Loch Kinellan. • Allt Drioghinn; • Black Water - Loch Garve to Conon confluence;

Type of Flooding	Likelihood	Water Body Name(s)
		• River Conon - Loch Achonachie to Black Water confluence; • Unnamed tributary of River Conon; • River Orrin; • Allt Goibhre; • Loch nan Eun; • Loch nam Bonnach (and tributaries); • Breakachy Burn; • Allt na h-Athain; • River Beauly; and • Allt nan Damh.
Surface water	High	• Peffery Burn / River Peffery; • Unnamed Surface Water Body; • An Dubh-lochan; • Loch Kinellan ; • Loch Garve; • Loch na Crann; • Loch Achonachie; • Black Water confluence with River Conon; • Unnamed Drain; • Loch nan Eun; • Loch nam Bonnach (and tributaries); • Caochan a'Mheanbh Chruidh; • River Beauly; and • Allt nan Damh.

Hydrogeology

10.4.80 The BGS GeoIndex Viewer indicates the following hydrogeology across Section E:

- Loch Eil Group – classified as a low productive bedrock aquifer which yields small amounts of groundwater in the near surface weathered zone and secondary fractures and flow is virtually all through fractures and discontinuities.
- Lower Old Red Sandstone – classified as a multi-layered, moderately productive aquifer where flow is virtually all through fractures and other discontinuities.
- Middle Old Red Sandstone (Undifferentiated) - classified as a moderately productive bedrock aquifer, comprised of sandstones, mudstones, conglomerates and interbedded lavas which yield small amounts of groundwater locally.
- Glenfinnan Group – classified as a low productivity bedrock aquifer which yields small amounts of groundwater in near surface weathered zone and secondary fractures. Flow is virtually all through fractures and other discontinuities.

10.4.81 There are three groundwater bodies underlying Section E of the Proposed Development; Muir of Ord (ID: 150619), Northern Highlands (ID: 150701) and Invergordon (ID: 150679). Muir of Ord has a SEPA overall condition classification of 'Poor' as of 2023. Northern Highlands and Invergordon have a SEPA overall condition classification of 'Good' as of 2023. The Muir of Ord groundwater body is Old Red Sandstone North and has low to high aquifer productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Northern Highlands groundwater body has an aquifer typology of Precambrian North and has low or very

low productivity. It is overlain by moderate to low permeability strata which is several metres thick. The Invergordon groundwater body is Old Red Sandstone North and has low to high aquifer productivity. It is overlain by moderate to low permeability strata which is several metres thick.

10.4.82 The BGS groundwater vulnerability (Scotland) map shows that parts of Section E of the Proposed Development are defined as class 5 which means it is vulnerable to most pollutants, with rapid impact in many scenarios. The remainder of Section E is class 4 which is defined as vulnerable to those pollutants not readily absorbed or transformed.

10.4.83 As a result of the receptor's 'Good' status in places and groundwater vulnerability, groundwater is considered to be of High sensitivity in Section E of the Proposed Development.

Groundwater Dependent Terrestrial Ecosystems

10.4.84 In accordance with SEPA guidance and their Scoping Response an assessment of GWDTE has been undertaken and is presented as **Volume 5, Appendix 10.3: GWDTE Assessment**. A summary of the habitat surveys completed is provided in **Chapter 8: Ecology and Nature Conservation** along with a detailed National Vegetation Classification (NVC) habitat plan which has been used to inform the assessment of GWDTEs. GWDTEs across the Proposed Development are illustrated in **Volume 3, Figure 10.7.**

10.4.85 **Volume 5**, **Appendix 10.3: GWDTE Assessment** provides a summary of the GWDTEs within Section E, and concludes that one habitat is assessed to be moderately groundwater dependent (M16 NVC habitat near tower S189), and all other habitats areas are sustained by rainfall and waterlogging of soils, rather than by groundwater across Section E.

Surface Water Quality

10.4.86 Water quality is monitored by SEPA and classified annually in accordance with the requirements of the WFD. **Table 10.34** provides summary details of the SEPA classifications reported in 2023 (the latest reporting cycle) across Section E. Smaller watercourses within the Study Area are not monitored by SEPA. Surface watercourses and waterbodies across the Proposed Development are illustrated in **Volume 3, Figure 10.2**.

Table 10.34: Surface Water Quality Across Section E

Name	SEPA ID	Waterbody	WFD status	Location / Description
River Peffery	20147	River	Moderate	Draining from Northwest to southeast into the Cromarty Firth, the River Peffery is crossed by the overhead route at approximately 247500 E 860371 N
Black Water – Conon confluence	23392	River	Good	The Black Water drains northwest to southeast. The Proposed Development crosses the watercourse at approximately 246221 E 854924 N
River Conon	20166	River	Good	The River Conon drains from Loch Achnonachie from the west to the east. The Proposed Development crosses the watercourse at approximately 245408. E 854258 N.
Loch Achonachie	20166	Loch	Good	Loch Achonachie is located approximately 387 m west and upstream of the overhead route. With

Name	SEPA ID	Waterbody	WFD status	Location / Description
				the closest location being 244578 E 854130 N.
River Orrin	20174	River	Good	The River Orrin drains from the west to its confluence with River Conon to the east. The Proposed Development crosses the watercourse at approximately 245134 E 852341 N.
Allt Goibhre	20177	River	Poor	The Allt Goibhre drains from the southwest, discharging to the River Orrin. The Proposed Development crosses the Allt Goibhre at approximately 247580 E 850534 N.
Logie Burn	20173	River	Poor	The Logie Burn drains from Loch nan Eun to the northwest of the Proposed Development to the Muir of Ord to the east. The Proposed Development crosses Logie Burn at approximately 248006 E 848783 N.
Breakachy Burn	20216	River	High	The Breakachy Burn drains from west to east, discharging into the River Beauly. The Proposed Development crosses Breakachy Burn at approximately 245246 E 845257 N.
River Beauly	20209	River	Good	The River Beauly drains south to north through the Study Area, discharging into the Beauly Firth over 8 km from the Proposed Development. The route crosses the River Beauly at approximately 247075 E 843080 N.

Summary of Sensitive Water Environment Receptors

10.4.87 **Table 10.35** outlines the receptors within Section E identified as part of the baseline study, and their sensitivity based upon the criteria contained in **Table 10.2.**

Table 10.35: Sensitivity of Receptors within Section E

Receptor	Sensitivity	Reason for Sensitivity
Designated Sites/Sensitive Environment	High	Section E of the Proposed Development is Hydrologically connected to areas that are protected and rely on the water environment.
Groundwater	High	Groundwater has been classified by SEPA as Good and vulnerability is classified as High.
Surface water	High	Surface water watercourses and surface water bodies have been classified by SEPA with Good overall status and several of the catchments have been designated as DWPA.
Flood Risk to the Proposed Development and impacts to flood risk from the Proposed Development	Medium	Sensitivity is based on potential for increase in flood as a result of the Proposed Development. Minor floodplains have been identified adjacent to the larger watercourses crossed by the Proposed Development. Impacts to flooding and

Receptor	Sensitivity	Reason for Sensitivity
		impacts from flooding are assessed to be of local scale and medium environmental value.
Drinking Water Protected Areas and Private Water Supplies	High	Properties have been identified to be served by a PWS that are downgradient of the Proposed Development.
Groundwater Dependent Terrestrial Ecosystems	High	GWDTEs have been identified within 250 m of the Proposed Development. Anything within this distance with excavations greater than 1 m depth must be assessed as impacts on groundwater connectivity could impact the quality of the GWDTE.

Future Baseline

10.4.88 There is potential for climate change to impact on future baseline conditions. Climate change studies predict a decrease in summer precipitation and an increase in winter precipitation alongside slightly higher average temperatures. This suggests that there may be greater pressures on PWS in summer months in the future. However, 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 potential significant effects.

10.5 Assessment of Effects

Potential Construction Impacts

10.5.1 Potential construction impacts have been identified with reference to relevant guidance, through consultation and team discussions, through targeted research on hydrological and water quality effects and by considering the information provided by the OHL Contractors on infrastructure and construction methods.

10.5.2 During the construction phase, the Proposed Development has the potential to result in the following effects (in the absence of appropriate controls or mitigation) on the receptors identified at **Section 10.4** above:

- Impediments to and modification of surface water drainage patterns;
- Pollution incidents resulting in an adverse effect on surface water or groundwater quality;
- Impediments to surface and groundwater flows as a result of excavations;
- Increased flood risk to areas downstream of the site through increased surface water runoff;
- Reduction in the quality and quantity of supply to PWS and DWPAs;
- Reduction in the quality and quantity of supply of surface and groundwater to designated sites and GWDTEs; and
- Erosion and sedimentation resulting in a reduction in the quality of surface watercourses.

10.5.3 The assessment identifies potential effects across all sections rather than identifying potential effects at each section of the Proposed Development. Sensitivity and magnitude will not alter for each section and as such grouping the potential effects is deemed appropriate.

<u>Impediments to and Modification of Surface Water Drainage Patterns</u>

10.5.4 Construction activities in or adjacent to watercourse channels, the location of watercourse crossings in constrained channels or inadequately designed crossings could impede flows within watercourses and cause blockages, resulting in flooding upstream.

10.5.5 Buffers between the Proposed Development (including towers and access tracks) and watercourses have been implemented in the design based on SEPA's Recommended Riparian Corridor where possible. The buffers from SEPA's Recommended Riparian Corridor are summarised in **Table 10.36** below.

Table 10.36: SEPA Recommended Riparian Corridor

Channel Width	Width of Buffer Strip (either side of channel)
Less than 2 m	10 m
2-15 m	15 m
More than 15 m	30 m

10.5.6 There are 23 occurrences (shown in **Table 10.37**) where proposed towers are located within the SEPA recommended riparian corridor for a particular watercourse. The Limit of Deviation (LoD) which forms part of the Proposed Development would be used, so far as practicable, to micro-site towers on the most suitable ground conditions and in areas where there is least potential to impair water resources during construction of a tower.

10.5.7 It is recognised that when works are undertaken close to water and within the SEPA Recommended Riparian Corridor, there is a need for increased monitoring and management of construction, dismantling and restoration works. Specific drainage management plans, method statements, monitoring and pollution incident response plans relevant to the works at these locations are required and need to be agreed with statutory consultees, including SEPA. Towers which would require this are shown in **Table 10.37** below.

Table 10.37: Towers within the SEPA Recommended Riparian Corridor

Section	Tower Number
A	N39, N45, N52, N65, N68, N69, N139, N143, N178, N181, N183, N189
B	N220, N239, N247, N258, N265, N274
C	S22
D	S147
E	S181, S187, S192

A schedule of watercourse crossings is provided in **Volume 5**, **Appendix 10.1: Schedule of Permanent Watercourse Crossings**, which identifies 180 watercourse crossings within the Proposed Development. Compliance with the measures set out in WE1 of **Table 10.5** and **Volume 5**, **Appendix 3.3: GEMPs** will be followed for all watercourse crossings in order to minimise and reduce the impact of alterations to surface water drainage patterns.

10.5.8 Alterations to surface water drainage patterns have the potential to impact surface water, which has been identified as a highly sensitive receptor. With the embedded mitigation measures detailed in WE1 in **Table 10.5** and the best practice measures summarised in paragraph 10.3.28, the magnitude of the potential impact on surface water drainage patterns is assessed as negligible. The effect is therefore assessed as **negligible** and **not significant**. No additional mitigation, over and above confirmatory monitoring, is required.

Pollution Incidents

10.5.9 During the construction phase, a number of potential pollutants would be present on-site to facilitate civil engineering activities, including oil, fuels, chemicals, unset cement and concrete, waste and wastewater from

construction activities. With chemicals and oil being stored and used on-site there is the potential for a pollution incident. Any pollution incident occurring on site could have a detrimental effect on the water quality of the nearby surface waters, groundwater and soils (see **Chapter 11: Geological Environment**), thereby also indirectly affecting ecology (see **Chapter 8: Ecology and Nature Conservation).**

10.5.10 As detailed in **Section 10.3** and WE2 of **Table 10.5**, the Proposed Development will be constructed in accordance with the Applicant's GEMPs and relevant technical guidance, PPG/GPPs and other codes of best practice, to limit the potential for contamination of both ground and surface waters. In addition, a CEMP will be prepared by the Principal Contractors, which will include a groundwater and surface water quality management plan as well as a Pollution Prevention Plan.

10.5.11 A commitment has also been made to prepare detailed drainage management plans for the locations of the Proposed Development that are within the SEPA recommended riparian corridor of a water feature which is further detailed in WE1 of **Table 10.5**. These plans will be agreed with statutory consultees, including SEPA, prior to works in these areas commencing, and be used to safeguard surface and groundwater quality.

10.5.12 By following the applicant's GEMPs shown in paragraph 10.3.25 and the mitigation detailed in WE2 of **Table 10.5,** this would significantly reduce the likelihood of pollutants, including suspended solids, being discharged to nearby watercourses or groundwater.

10.5.13 Surface water and groundwater which may be impacted by pollution incidents have been identified as highly sensitive receptors. With the embedded mitigation measures detailed in WE2 in **Table 10.5** and the best practice measures summarised in paragraph 10.3.28, the magnitude of the potential impact on surface water and groundwater quality is assessed as negligible. The effect is therefore assessed as **negligible** and **not significant**. No additional mitigation, over and above confirmatory monitoring, is required.

Impediments to Surface and Groundwater Flow

10.5.14 Excavations could disrupt shallow groundwater systems resulting in the temporary lowering of groundwater levels in the immediate vicinity of the excavations and temporary alterations to flow paths during dewatering activities within the new tracks and tower foundations. It is anticipated, however, that earthworks associated with the proposed infrastructure will likely result in negligible change to the local subsurface and groundwater flows.

10.5.15 The best practice measures listed in paragraph 10.3.28 will be included in the CEMP; these will be used to control and manage surface water and groundwater flows and maintain existing water flow paths at a local scale. These will be used to ensure water flow paths to PWS sources and water-dependent habitats would be maintained.

10.5.16 As referenced in paragraph 10.5.7, a commitment has also been made to prepare detailed drainage management plans for the locations of the Proposed Development that are within the SEPA recommended riparian corridor. These plans will be agreed with statutory consultees, including SEPA, prior to works in these areas commencing and will be used to safeguard existing surface water and groundwater flow paths.

10.5.17 Surface water and groundwater have been identified as highly sensitive receptors. With the embedded mitigation measures detailed in WE4 in **Table 10.5** and the best practice measures summarised in paragraph 10.3.28, the magnitude of the potential impact on groundwater and surface water flows is assessed as **negligible**. The effect is therefore assessed as **negligible** and **not significant**. No additional mitigation, over and above confirmatory monitoring, is required.

Increase in Flood Risk

10.5.18 A summary of fluvial flood risk for each section of the Proposed Development is provided throughout **Section 10.4**.

10.5.19 Surface water flows can be impeded by construction activity in or adjacent to stream channels, crossing locations, and the construction of access tracks traversing hills with inadequate cross track drainage installed. Blockages could lead to flooding upstream.

10.5.20 Areas of existing flood risk are considered to have a medium-high sensitivity to change from the Proposed Development.

10.5.21 The Proposed Development will use existing tracks and watercourse crossings wherever possible. Where permanent new access tracks or watercourse crossings are required, they will be designed in line with SEPA guidance. The design and capacity of the watercourse crossings would be agreed by the Principal Contractors in consultation with SEPA as part of the detailed design. Key measures identified to minimise alterations to surface water drainage patterns include:

- Application of sustainable drainage techniques to increase peak lag time and implementation of cross-drains at appropriate intervals and frequent discharge points to reduce scour potential; and
- Minimising the size and duration of in-channel works.

10.5.22 The CEMP (and associated GEMPs) will set out detailed drainage management plans for the locations of the Proposed Development that are within the SEPA recommended riparian corridor. These plans will be agreed with statutory consultees, including SEPA, prior to works in these areas commencing and will be used to ensure no increase in flood risk.

10.5.23 Flood risk to the Proposed Development and impacts to flood risk from the Proposed Development have been identified to be of medium sensitivity. With the embedded mitigation measures detailed in WE9 in **Table 10.5** and the best practice measures summarised in paragraph 10.3.28 the magnitude of the potential impact on flood risk is assessed as negligible. The effect is therefore assessed as **negligible** and **not significant**. No additional mitigation, over and above WE9, is required.

PWS and DWPAs

10.5.24 The baseline assessment has confirmed that local properties maintain their own PWS and that some of the water sources lie close to or downstream of the Proposed Development. Micro-siting, and good practice techniques that prevent pollution of surface water and maintain the integrity of the supply pipework, will be required to safeguard these PWS. As not all PWS have been identified from the LOQs, the Principal Contractors will be required to ground-truth the sites and confirm PWS locations.

10.5.25 The Proposed Development also crosses surface water catchments which are designated as DWPAs. Section B travels through the Loch Horn and Loch Lunndaidh, Loch Laoigh and Loch Lannsaidh DWPAs. Section D travels through Wester Fearn Burn and River Glass DWPAs.

10.5.26 Water quality monitoring before and during the construction phase will be undertaken for water sources which have been identified as potentially at risk from the Proposed Development, as set out in **Volume 5**, **Appendix 10.2: DWPA and PWS Risk Assessment**.

10.5.27 The monitoring will be used to ensure that the impacts on quality and/or quantity of water to these sources is minimised. Monitoring will be carried out at a specified frequency (depending upon the construction phase) on

these catchments in conjunction with relevant statutory consultees. An example monitoring programme is given in **Volume 5**, **Appendix 10.2: DWPA and PWS Risk Assessment.**

10.5.28 As detailed in **Volume 5**, **Appendix 10.2: DWPA and PWS Risk Assessment,** it is expected that a water monitoring programme proportionate to the risk posed to a PWS source or DWPA area is included in the CEMP, with focused monitoring (e.g. increased frequency and parameter suite) used at locations where the risk to a water source is greater.

10.5.29 This monitoring would continue throughout the construction phase and immediately post construction. Monitoring would be used to allow a rapid response to any pollution incident and also to assess the success of mitigation or remedial measures. Monitoring frequency may increase during the construction phase following implementation of remedial measures.

10.5.30 The performance of site control measures would be kept under review by the water monitoring schedule, based on a comparison of data taken during construction with a baseline data set, sampled prior to the construction period. This should take into consideration seasonal and local hydrological variations.

10.5.31 The measures to protect PWS and DWPA are detailed in embedded mitigation item WE6 in **Table 10.5**, and further details on the monitoring methodology and identified supplies and abstractions subject to monitoring are provided in **Volume 5**, **Appendix 10.2: DWPA and PWS Risk Assessment.**

10.5.32 PWS and DWPAs have been identified as highly sensitive receptors. With the embedded mitigation measures detailed in WE6 in **Table 10.5** and the best practice measures summarised in paragraph 10.3.28, the magnitude of the potential impact on PWS and DWPAs is assessed as negligible. The effect is therefore assessed as **negligible** and **not significant**. No additional mitigation, over and above WE6, is required.

Alterations to GWDTEs and Designated Sites

10.5.33 The water dependent and designated sites identified as having assumed hydraulic continuity within each section of the Proposed Development are detailed in **Section 10.4**. Water quality monitoring before and during construction would be undertaken to ensure the main tributaries of the main channels which discharge to designated sites have no significant reduction in water quality or quantity. Monitoring will be carried out at a specific frequency and duration prior to, during and after construction at these locations and would be agreed with THC, NatureScot and SEPA prior to commencement through the water quality monitoring programme.

10.5.34 An assessment has been undertaken for The Flow Country World Heritage Site, which is featured across Section A as detailed in **Table 10.7**. This assessment is shown in **Volume 5, Appendix 8.10: WHS Assessment** and details a baseline assessment for all disciplines and the assessment of effects for these disciplines. In relation to the water environment, the assessment of effects and embedded mitigation measures specific for The Flow Country are the same as for other designated sites. The embedded mitigation for this is detailed in WE5 in **Table 10.5.**

10.5.35 A standalone GWDTE assessment has been carried out in accordance with SEPA Guidance on Assessing the Impacts of Development Proposals on Groundwater Dependent Terrestrial Ecosystems and is provided in **Volume 5**, **Appendix 10.3: GWDTE Assessment**. This assessment identifies a total of three GWDTEs within 100 m of excavations less than 1 m in depth or within 250 m of excavations greater than 1 m, and therefore subject to additional mitigation in accordance with SEPA Guidance on Assessing the Impacts of Development Proposals on GWDTEs. The need and methodology for any monitoring will be secured and agreed with SEPA on a case-by-case basis, and in accordance with the approach set out in WE5 in **Table 10.5**.

10.5.36 GWDTEs and designated sites/sensitive environments have been identified as highly sensitive receptors. With the embedded mitigation measures detailed in WE5 in **Table 10.5** and the best practice measures summarised in paragraph 10.3.28, the magnitude of the potential impact on GWDTEs and designated sites is assessed as negligible. The effect is therefore assessed as **negligible** and **not significant**. No additional mitigation, over and above WE5, is required.

Erosion and Sedimentation

10.5.37 Soil erosion, loss of soil, and sediment generation may occur in areas where the ground has been disturbed during construction including where engineering activities occur close to or in watercourses; or where higher velocity surface water flows may occur due to local slopes and drainage design.

10.5.38 Surface water passing through small surface drains, efficiently draining the new infrastructure, could exhibit higher localised flows, increasing the potential for bank erosion.

10.5.39 Sediment transport in watercourses can result in high turbidity levels which affect the ecology, particularly fish stocks, by reducing the light and oxygen levels in the water. Sediment deposition can further effect watercourses by potentially smothering plant life, invertebrates, and spawning grounds, and can reduce the flood storage capacity of channels and block culverts, resulting in an increased flood risk.

10.5.40 In the case of pollution incident effects, good practice measures and the dilution factor involved would be expected to reduce any potential sedimentation effect downstream.

10.5.41 Surface water which could be impacted by erosion and sedimentation have been identified as highly sensitive receptors. With the embedded mitigation measures set out in the relevant GEMPs and WE3 in **Table 10.5** and the best practice measures summarised in paragraph 10.3.28, the magnitude of the potential impact on surface watercourses is assessed as negligible. The effect is therefore assessed as **negligible** and **not significant**. No additional mitigation, over and above WE3, is required.

Potential Operational Effects

10.5.42 During the operational phase of the Proposed Development, it is anticipated that limited maintenance of infrastructure would be required. Therefore, potential effects associated with the operational phase of the Proposed Development are anticipated to be negligible when compared to the construction phase.

10.5.43 Should any maintenance or repair works be required which would involve construction activities, method statements would be developed and used which will adopt the best practices agreed with regulators as part of the CEMP, or where required refer to the detailed drainage plans agreed with consultees where works are within the SEPA recommended riparian corridor.

Surface Water and Groundwater Quality

10.5.44 The possibility of a pollution event, resulting in a reduction of surface water or groundwater quality, occurring during operation is very unlikely due to the limited works required to operate the OHL. Any maintenance or repair activities would be undertaken using the same controls agreed with statutory consultees and deployed during the construction phase.

10.5.45 Newly excavated drains and track dressings may be prone to erosion. Appropriate design of the drainage system, incorporating sediment traps, would reduce the potential for the increased delivery of sediment to watercourses. Potential effects from sedimentation or erosion during the operational phase are considered to come from permanent linear features such as access tracks on steeper slopes, where velocities in drainage

channels are higher. Flow attenuation measures implemented during construction would remain and be maintained to slow runoff velocities and prevent erosion until vegetation becomes established.

10.5.46 Based upon this, the potential risk associated with frequency, duration and likelihood of a pollution event is low. It is, therefore, anticipated that the magnitude of a potential impact on surface water or groundwater during the operational phase of the Proposed Development would be negligible, as no detectable change would likely occur. The effect on surface water and groundwater quality is assessed as **negligible** and **not significant**. No further or additional mitigation is required.

Surface and Groundwater Flow

10.5.47 During the operation of the Proposed Development, it is not anticipated that there would be any excavation or need to stockpile large volumes of soils, reducing the potential for effects on surface and groundwater flows. Any excavation, handling and placement of material would be subject to the same safeguards that would be used during the construction phase of the Proposed Development.

10.5.48 Should any maintenance or repair works be required on sections of track, relevant good practice measures as detailed for the construction phase would be required. Extensive work at watercourse crossings/adjacent to the water environment may require approval from SEPA under the CAR (depending upon the nature of the activity).

10.5.49 The likelihood, magnitude and duration of works which have the potential to impact surface and groundwater flow paths would be negligible following adherence to good practice measures. Therefore, the potential effect is assessed as **negligible** and **not significant**. No mitigation is required.

Flood Risk

10.5.50 Culverts beneath permanent access tracks could become blocked without routine inspection or maintenance. Any reduction in conveyance could locally increase flood risk.

10.5.51 Proposed crossings' infrastructure would be subject to routine inspection, and if required, maintenance. Where identified, any remedial works would be undertaken using the same controls and authorisations detailed above and would be deployed during the construction phase.

10.5.52 The likelihood, magnitude of impact and duration of works which have the potential to alter surface and groundwater flood risk would be negligible following adherence to good practice measures. Therefore, the effect on surface and groundwater flood risk is assessed as **negligible** and **not significant**. No mitigation is required.

Private Water Supplies and DWPAs

10.5.53 Given the controls and assessment presented in WE6 of **Table 10.38** and **Volume 5**, **Appendix 10.2: DWPA and PWS Risk Assessment**, no significant impact on surface water or groundwater quality or flow is anticipated during the operational phase of the Proposed Development. Therefore, the effect on PWS sources and DWPAs is assessed as **negligible** and **not significant**. No additional mitigation, over and above WE6, is required.

Designated Sites within Hydraulic Connection to the Proposed Development

10.5.54 The controls which would be adopted during the operational phase, and which are in accordance with best practice measures, will safeguard surface water and groundwater quality, surface water and groundwater flows, and mitigate flood risk. They would ensure that the potential impact on designated sites identified with hydraulic continuity with the Proposed Development is **negligible** and **not significant**.

10.6 Cumulative Effects

10.6.1 The greatest potential for cumulative effects arises when the construction phase of another development with the potential for hydrological connectivity overlaps with the construction phase of the Proposed Development. These in-combination effects are considered to have the potential to be significant. The other reasonably foreseeable developments identified to have potential in-combination cumulative effects with the Proposed Development are detailed in **Chapter 5: EIA Process and Methodology.**

10.6.2 Whilst other developments might present significant effects to water environment receptors in their own right, no significant effects have been identified associated with the Proposed Development. On the basis other developments will also employ effective controls and good practice measures, no significant in-combination cumulative effects are anticipated.

10.7 Mitigation

10.7.1 As there are no potential significant effects predicted in the context of the EIA regulations, other than the good practice measures detailed in **Table 10.38** that SSEN Transmission implements as standard, no specific mitigation is required.

10.8 Residual Effects

10.8.1 No significant residual effects as a result of the construction and operation of all sections of the Proposed Development, including in combination effects, have been identified. No further mitigation beyond the good practice measures outlined in this chapter and through the CEMP and GEMPs that shall be prepared by the Principal Contractors will be required.

10.9 Summary and Conclusion

10.9.1 A summary of assessed effects and identified mitigation measures required to reduce the potential effects to acceptable levels are identified in **Table 10.38.**

Table 10.38: Summary of Effects on the Water Environment

Potential Effect	Embedded Mitigation Measures	Embedded Mitigation Summary Reference	Reason for Impact Magnitude	Significance of Effect
Construction Phase				
Impediments to and Modification of Surface Water Drainage Patterns	Watercourse Crossings GEMP. Working in or near Water GEMP. Site Water Management and Pollution Prevention Plan.	WE1, WE9	**Negligible** – By following the SSEN GEMPs listed, and the Site Water Management and Pollution Prevention Plan will mean that any impediments to and modifications of surface water drainage patterns will be non-material. The watercourse crossing GEMP features adherence to SEPA watercourse crossing guidance which means watercourse crossings will be approved through the Controlled Activities Regulations. The working in or near water GEMP features set out buffers to watercourses that will be within adherence to SEPA recommended riparian corridors. This embedded mitigation will mean that at most there will be a detectable but non-material effect on surface water drainage patterns. There would at most be a **minor** severance or disturbance such that the functionality of the receptor is not affected.	**Not significant**.
Pollution and Spillage	Working with concrete GEMP. Working in or near Water GEMP. Oil Storage and Refuelling GEMP. Site Water Management and Pollution Prevention Plan. Confirmatory water quality monitoring.	WE2	**Negligible** – By following the SSEN GEMPs listed, the Site Water Management and Pollution Prevention Plan, and confirmatory water quality monitoring, any pollution incidents to surface water will be non-detrimental. The working in or near water GEMP highlights that a 10 m vegetated buffer strip will be left in place around watercourses to act as a barrier to pollution. The working with concrete GEMP highlights dedication to storing bulk and bagged cement and concrete additives at least 30 m away from watercourses, gullies and drains in properly secured, covered and bunded areas, protecting the watercourses from pollution from this source. Oil storage and refuelling GEMP highlights a dedication to store fuels at least 30 m from any sensitive environmental receptors as well as	**Not significant**.

Potential Effect	Embedded Mitigation Measures	Embedded Mitigation Summary Reference	Reason for Impact Magnitude	Significance of Effect
			refuelling to be conducted in specific areas, where not possible, must be at least 30 m from any surface waters. Embedded mitigation will mean that at most there is a detectable non-detrimental change to the baseline hydrochemistry or hydrological environment. This potential effect will not reduce the watercourse quality classification.	
Impediments to Surface Water and Groundwater Flow	Bad Weather GEMP. Soil Management GEMP. Working in or near Water GEMP. Site Water Management and Pollution Prevention Plan. Location specific drainage from works within SEPA recommended riparian zone.	WE4, WE9	**Negligible** – By following the SSEN GEMPs listed, the Site Water Management and Pollution Prevention Plan, and location specific drainage from works within SEPA recommended riparian zone, any impediments to surface and groundwater flow will be non-detrimental. The bad weather GEMP highlights measures that will be in place to counter potential occurrences of bad weather during construction. These measures involve daily checks of the weather forecast and re-locating materials stored close to watercourses during construction activities which could be washed into water in times of storm to avoid impediments to surface water flow. The soil management GEMP highlights that soils will be stored a minimum of 10 m from watercourses and protected from run-off from adjacent areas. The working in or near water GEMP highlights that the site should be kept tidy, and no material should be stored too close to watercourses or surface water features to avoid impediments to flow. Embedded mitigation will mean that at most there is a detectable non-detrimental change to the hydrological environment.	**Not significant**.
Increase in flood risk	Mitigation by design. Watercourse Crossings GEMP.	WE9	**Negligible** – By following the SSEN GEMP listed, the Site Water Management and Pollution Prevention Plan, and mitigation by design any increase in flood risk will be marginal.	**Not significant**.

Potential Effect	Embedded Mitigation Measures	Embedded Mitigation Summary Reference	Reason for Impact Magnitude	Significance of Effect
	Site Water Management and Pollution Prevention Plan.		Mitigation by design has been utilised to locate towers out with known flood zones to avoid an increase in flooding. The watercourse crossing GEMP highlights features for watercourse crossings to avoid increase in flood risk such as an allowance for a 1 in 200-year climate change adjusted flow in accordance with SEPA best practice guidance. Embedded mitigation will mean that at most there will be a marginal increase in the probability of flooding onsite and offsite and marginal decrease on the ability of the functional flood plain to attenuate the effects of flooding.	
Disruption to PWS and DWPAs	Mitigation by design. Working in or near Water GEMP. Watercourse Crossings GEMP. Private Water Supplies GEMP Water quality monitoring programme from SEPA Guidance[4] Site Water Management and Pollution Prevention Plan.	WE6	**Negligible** – By following the SSEN GEMPs listed, the Site Water Management and Pollution Prevention Plan, and mitigation by design any detectable change to PWS and DWPAs would be non-material. Mitigation by design has been utilised to locate towers away from known PWS where possible to avoid disruption. The working in or near water and watercourse crossing GEMPs highlight specific measures to avoid disruption of flow and pollution into water connected to the PWS and DWPAs. The Private Water Supplies GEMP has informed the PWS Risk Assessment shown in **Volume 5, Appendix 10.2.** Embedded mitigation will mean that at most there will be a detectable but non-material effect on PWS or DWPAs or a moderate effect on its integrity or where there would be a **minor** severance or disturbance such that the functionality of the water supply would not be affected.	**Not significant**.
Alterations to GWDTEs and Designated Sites	Working with concrete GEMP. Working in or near Water GEMP. Watercourse Crossing GEMP. SEPA guidance.	WE5	**Negligible** – By following the SSEN GEMPs listed and the Site Water Management and Pollution Prevention Plan, any detectable change to GWDTEs and designated sites would be non-detrimental.	**Not significant**.

Potential Effect	Embedded Mitigation Measures	Embedded Mitigation Summary Reference	Reason for Impact Magnitude	Significance of Effect
	Site Water Management and Pollution Prevention Plan.		The GEMPs listed feature measures to reduce risk of pollution and reduce the chance of impediments to flow that could impact GWDTEs and designated sites. SEPA guidance on assessing the Impacts of development proposals on GWDTEs has been used to inform the GWDTE assessment shown in **Volume 5, Appendix 10.3** which has highlighted areas with suspected GWDTEs and includes measures to mitigate alterations to this receptor. A specific assessment has been completed for The Flow Country World Heritage Site, featured at parts of Section A, this is shown in **Volume 5, Appendix 8.10.** Embedded mitigation will mean that at most there will be a detectable non-detrimental change to the baseline hydrochemistry or hydrological environment.	
Erosion and Sedimentation decreasing water quality and impeding drainage patterns	Working in or near Water GEMP. Watercourse Crossing GEMP. Soil Management GEMP. Site Water Management and Pollution Prevention Plan.	WE3	**Negligible** – By following the SSEN GEMPs listed and the Site Water Management and Pollution Prevention Plan, any increase in erosion and sedimentation would be non-detrimental. Working in or near water GEMP highlights methods that will be used during construction to avoid unnecessary erosion and sedimentation, such as reducing exposed working area using a phased construction and reinstating exposed soil as soon as practical. This also includes a commitment to avoid unnecessary vegetation removal, complying with agreed buffer zones where vegetation is left in place. The watercourse crossings GEMP highlights that any length of bank with bare earth shall be re-established with an appropriate and agreed mix of riparian vegetation or with a fully biodegradable geotextile to avoid erosion after the construction of the watercourse crossing. The soil management GEMP highlights that soil stripping should not occur in times of heavy rainfall to avoid increased sedimentation of watercourses and when reinstating soil should be reinstated as close to where it was removed to	**Not significant**.

Potential Effect	Embedded Mitigation Measures	Embedded Mitigation Summary Reference	Reason for Impact Magnitude	Significance of Effect
			restore local hydrological characteristics, therefore, reducing the chance of erosion. Embedded mitigation will mean that at most there will be a detectable non-detrimental change to the baseline hydrochemistry or hydrological environment.	
Operational Phase				
No additional effects or mitigation / enhancement identified.				
Cumulative Effects				
Cumulative effects are only considered to have the potential to be significant only where overlap in construction exists. Assuming other developments will employ effective controls and good practice measures, no significant in-combination cumulative effects are anticipated.				