Volume 2: Chapter 13 - Hydrology, Hydrogeology, Geology and Soils

VOLUME 2, CHAPTER 13: HYDROLOGY, HYDROGEOLOGY, GEOLOGY AND SOILS

13. HYDROLOGY, HYDROGEOLOGY, GEOLOGY AND SOILS

13.1 Introduction

13.1.1 This Chapter considers the likely significant effects of the Proposed Development (as defined below in **paragraph 13.1.8**) on hydrology, hydrogeology, geology and soils[1]. The assessment includes potential effects on water quality, flood risk and drainage, groundwater abstractions, private water supplies (PWS), peat, and groundwater dependent terrestrial ecosystems (GWDTE). Evaluation of the existing baseline environment has been made through a combination of desk-based study, field surveys and consultation.

13.1.2 The Chapter objectives with regards to the Proposed Development are as follows:

- describe the baseline environmental conditions;
- describe the assessment methodology and significance criteria used in completing the assessment;
- describe the potential effects, including cumulative effects, on hydrology, hydrogeology, geology and soils;
- describe the mitigation measures proposed to address likely significant effects (if required); and
- assess the residual effects remaining following implementation of mitigation (if required).

13.1.3 This Chapter should be read in conjunction with **Volume 1, Chapter 3: Project Description** of the Environmental Impact Assessment Report (EIAR) for full details of the Proposed Development.

13.1.4 The Chapter should be read alongside **Volume 2, Chapter 7: Land Use and Prime Agricultural Land** and **Volume 2, Chapter 11: Ecology** due to interactions between both chapters in terms of the potential for effects on water quality (and indirectly aquatic ecology) and GWDTEs. **Chapter 7: Land Use and Prime Agricultural Land** considers the effects on agricultural land and soils, whilst this chapter considers peat soils.

13.1.5 This chapter is supported by **Volume 3, Figures**, which are referenced throughout and introduced below:

- **Figure 13.1: Hydrology Overview**;
- **Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**;
- **Figures 13.3.1 to 13.3.15: Groundwater Abstractions, Water Supplies and GWDTE**;
- **Figure 13.4: Bedrock Geology**;
- **Figure 13.5: Superficial Geology**;
- **Figures 13.6.1 to 13.6.7: Soil Classification**;
- **Figures 13.7.1 to 13.7.7: Carbon and Peatland Classification (NatureScot, 2016)**; and
- **Figures 13.8.1 to 13.8.26: Probe Depths**.

13.1.6 The following appendices (**Volume 5**) are also referred to throughout:

- **Appendix 13.1: Watercourse Crossing and Buffers Assessment**;
- **Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment**;
- **Appendix 13.3: Peat Depth Survey Report**;
- **Appendix 13.4: Outline Peat Management Plan**;
- **Appendix 13.5: Groundwater Dependent Terrestrial Ecosystems (GWDTE) Assessment**;
- **Appendix 13.6: Peat Landslide Hazard and Risk Assessment (PLHRA)**;
- **Appendix 13.7: Contaminated Land Reports**; and
- **Appendix 13.8: Flood Modelling Study Report**.

[1] Consideration of the classification and use of agricultural soils is presented in **Volume 2, Chapter 7: Land Use and Prime Agricultural Land.**

13.1.7 The hydrology, hydrogeology, geology and peat assessments were undertaken by Kaya Consulting Limited, with specialist input from Offshore Wind Consultants (OWC) (an ABL Group Company) for the assessment of effects on peat and the Outline Peat Management Plan (PMP) and Peat Landslide Hazard and Risk Assessment (PLHRA).

13.1.8 The following terminology will be referred to throughout this Chapter:

- Site: the proposed Overhead Line (OHL) alignment plus 100 m either side of the OHL and 200 m around the OHL at angle towers (horizontal Limit of Deviation (LOD) (**Volume 3, Figure 1.1: Overview of the Proposed Development**). The Operational Corridor (OC) represents the wayleave extent that SSEN Transmission requires to provide for safe long-term access for OHL maintenance. The width of the OC is typically 45 m either side of the OHL centre line and will always be within the boundary of the LOD. The Site is located between Tealing in Angus and Kintore in Aberdeenshire and the new 400 kV double circuit OHL is approximately 105.2 km in length;
- Proposed Development: the Kintore to Tealing 400 kV OHL and associated infrastructure as described in **Volume 1, Chapter 3: Project Description**; and
- Private Water Supply (PWS): In Scotland, *The Private Water Supplies (Scotland) Regulations 2006* define private water supplies as those that are not provided by Scottish Water as part of its core functions. It is the owner's responsibility to manage the supply and keep it safe. PWS are regulated by local authorities. There are two types of PWS, and the legislation relating to each is different. Larger PWS or those with a commercial activity are defined as 'regulated supplies'. Smaller PWS that only serve domestic properties are classified as 'exempt supplies'.

13.2 Scope of the Assessment

Effects Assessed in Full

13.2.1 The EIA Scoping process, baseline conditions and professional judgement have together identified the following effects for detailed assessment:

- temporary (construction phase) pollution of surface watercourses, waterbodies, groundwater and subsequent impacts on the quality of PWS. There is the potential for increased sedimentation of watercourses/waterbodies/groundwater associated with the ground preparation works and subsequent construction of the towers and access tracks. Additionally, there is potential for chemical pollution such as fuel hydrocarbons and lubricants from construction processes and equipment to impact surface and groundwater sources. The risk is increased should construction take place within a flood risk area;
- effects during construction and operation on run-off rates and flood risk;
- effects during construction on yields of PWS abstractions and GWDTEs reliant upon groundwater resources that have subsurface flows or hydraulic connectivity impacted adversely by construction of tower foundations and/or access tracks. If PWS abstractions or GWDTE are identified within 250 m of the Proposed Development further assessment has been undertaken to accompany the EIAR to confirm the predicted effects of the proposals on the abstraction or GWDTE and propose additional mitigation measures, if required;
- potential for loss/disturbance/erosion of peat and carbon-rich soils during construction. In line with the mitigation hierarchy, construction on peat was avoided during the design of the Proposed Development, however due to other constraints a small part of the Proposed Development is within peat soils. The design has minimised the potential effects on peat through avoiding areas of deeper peat and also implementing suitable mitigation measures, which are summarised within the Outline PMP (**Volume 5, Appendix: 13.4 Outline Peat Management Plan**); and
- potential effect on the designated geological Site of Special Scientific Interest (SSSI) site in Section C.

13.2.2 It is noted that some of the above effects are scoped out of detailed assessment on a section by section basis, in a proportionate approach to the assessment following the establishment of the baseline conditions. This is described in **Table 13.13: Sensitivity of Receptors** following presentation of the baseline conditions.

13.2.3 Following the mitigation hierarchy by avoiding flood risk areas and buffering sensitive features (as per the Embedded and Applied Mitigation), many potential significant effects on the water environment can be avoided or reduced, including effects on water quality, run-off rates and flood risk to the downstream water environment. However potential significant effects

could occur locally at areas where watercourse buffers[2] have not been achieved (ie watercourse crossing of access tracks) or at local PWS/groundwater abstractions where recommended buffers cannot be achieved.

13.2.4 The assessment has been undertaken in line with the National Planning Framework 4 (NPF4) *Policies 5, 11* and *22*. With reference to flood risk, the 200-year plus climate change return period event is considered when assessing flood risk areas (eg via Scottish Environment Protection Agency (SEPA) Future Flood maps).

Effects Scoped Out

13.2.5 On the basis of the desk based and field survey work undertaken, the professional judgement of the EIA team, experience from other relevant projects, policy guidance or standards, and feedback received from consultees, the following effects have been 'scoped out' of detailed assessment.

- potential adverse effects on bedrock geology during construction and operation. The exception is the potential effect on the designated geological SSSI site in Section C;
- potential effects on channel morphology during construction and operation. There is no proposed infrastructure within SEPA's Geomorphic Risk Buffers[3] and new watercourse crossings in natural watercourses have been designed as single span bridges with no works on the bed or banks;
- potential adverse effects on surface water quality, PWS, groundwater abstractions and GWDTE during operation;
- potential effects on peat and other soils during the operational phase. The main impacts on peat (if any) will be in the construction phase; and
- other potential effects on soils and groundwaters including those arising from potentially encountering sources of land contamination.

Study Area

13.2.6 The study area for hydrology and hydrogeology comprises the Proposed Development and watercourses and catchments upstream and downstream of the Proposed Development; see **Volume 3, Figure 13.1: Hydrology Overview**. The proposed alignment within the Proposed Development is approximately 105.2 km long and crosses numerous watersheds/catchments. An initial desk study was carried out covering an area of 5 km around the Proposed Development to consider nearby catchments and receptors and feed into constraints mapping. The hydrology, hydrogeology and peat field survey areas focussed on the Site. It is noted that some early peat surveys were carried out on an alternative OHL route to inform constraints mapping and initial route optioneering; however, as this peat data is not relevant to the assessment of the Proposed Development it is not reported herein. **Volume 1, Chapter 4: Alternatives and the Routeing Process** details the approach and outcomes of the route optioneering process.

13.2.7 The search area for PWS comprises a 1 km buffer from the Proposed Development. The study area for the PWS and GWDTE assessment comprises a 250 m buffer from the Proposed Development. Existing conditions of the study area are described in **Section 13.4**.

2 Permanent and temporary infrastructure (including construction working areas) should be set back from water features by an appropriate buffer to protect the water environment. SEPA's recommended riparian corridor buffers (defined later) are used in this assessment.
3 SEPA's Geomorphic Risk Buffer is a GIS Layer created by SEPA, which maps locations where increased geomorphic adjustment of rivers is predicted to occur. This identifies areas where a wider riparian corridor would be beneficial, due to an increased potential risk of future bank erosion and geomorphic adjustment. The GIS layer was used to inform the design of the Proposed Development.

13.3 Assessment Methodology

Legislation, Policy and Guidance

Legislation

13.3.1 This assessment has been carried out by reference to relevant legislative requirements, including the following:

- *The Flood Risk Management (Scotland) Act 2009*[4];
- *The Water Environment (Controlled Activities) (Scotland) Regulations 2011* (CAR)[5];
- *The Water Framework Directive (2000/60/EC)*[6] (WFD), and *Water Environment and Water Services (Scotland) Act* (WEWS Act) *2003*[7];
- *The Pollution Prevention and Control (Scotland) Regulations 2012*[8];
- *The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017* (the EIA Regulations)[9];
- *The Electricity Act 1989*[10];
- *The Nature Conservation (Scotland) Act 2004*[11];
- *The Scotland River Basin District (Standards) Directions 2024*[12];
- *The Scotland River Basin District (Status) Directions 2024*[13];
- *The Private and Public Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2015*[14];
- *The Public Water Supplies (Scotland) Regulations 2014*[15];
- *The Private Water Supplies (Scotland) Regulations 2006*[16];
- *The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017*[17];
- *The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013*[18]; and
- *The Waste Management Licensing (Scotland) Regulations 2011*[19].

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[4] Flood Risk Management (Scotland) Act 2009 (asp 6) [online]. Available at: https://www.legislation.gov.uk/asp/2009/6 [Accessed: 10 June 2025]
[5] The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (SSI 2011/209) [online]. Available at: https://www.legislation.gov.uk/ssi/2011/209 [Accessed 20 May 2025]
[6] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (2000) [online]. Official Journal L327. Available at: https://www.legislation.gov.uk/eudr/2000/60 [Accessed: 20 May 2025]
[7] Water Environment and Water Services (Scotland) Act 2003 [online]. Available at https://www.legislation.gov.uk/asp/2003/3/contents [Accessed: 20 May 2025]
[8] Pollution Prevention and Control (Scotland) Regulations 2012. SSI 2012/360 [online]. The Stationary Office. Available at: https://www.legislation.gov.uk/ssi/2012/360/contents [Accessed: 20 May 2025]
[9] The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017[online]. Available at https://www.legislation.gov.uk/ssi/2017/101/contents [Accessed: 20 May 2025]
[10] Electricity Act 1989 [online]. Available at https://www.legislation.gov.uk/ukpga/1989/29/contents [Accessed: 20 May 2025]
[11] Nature Conservation (Scotland) Act 2004 [online]. Available at https://www.legislation.gov.uk/asp/2004/6/contents [Accessed: 20 May 2025]
[12] Scotland River Basin District (Standards) Directions (2024) [online]. Available at: https://www.gov.scot/publications/the-scotland-river-basin-district-standards-directions-2024/ [Accessed: 20 May 2025].
[13] Scotland River Basin District (Status) Directions (2024) [online]. Available at: https://www.gov.scot/publications/the-scotland-river-basin-district-status-directions-2024/ [Accessed: 20 May 2025].
[14] The Private and Public Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2015 [online]. Available at: https://www.legislation.gov.uk/ssi/2015/346/contents/made [Accessed: 20 May 2025].
[15] Public Water Supplies (Scotland) Regulations 2014 (SSI 2016/364) [online]. Available at: https://www.legislation.gov.uk/ssi/2014/364/contents/made [Accessed: 20 May 2025].
[16] The Private Water Supplies (Scotland) Regulations 2006 (SSI 2006/209) [online]. Available at: https://www.legislation.gov.uk/ssi/2006/209/contents [Accessed: 20 May 2025].
[17] The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017 (SSI 2017/282) [online]. Available at: https://www.legislation.gov.uk/ssi/2017/282/contents/made [Accessed: 20 May 2025].
[18] The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013 (SSI 2013/29) [online]. Available at: https://www.legislation.gov.uk/ssi/2013/29/contents/made [Accessed: 20 May 2025].
[19] The Waste Management Licensing (Scotland) Regulations 2011 [online]. Available at: https://www.legislation.gov.uk/ssi/2011/228/contents/made [Accessed: 20 May 2025].

Policies and Guidance

13.3.2 This assessment has been carried out by reference to relevant policies and guidance including:

- Scottish Government 2023 National Planning Framework (NPF) 4[20]: *Policy 5 (Soils), Policy 11 (Energy), Policy 22 (Flood Risk Management)*;
- Scottish Government 2017 *Planning Advice Note 1/2013: Environmental Impact Assessment*, Revision 1.0, May 2017[21];
- *Scottish Government 2017 Planning Circular 1/2017: Environmental Impact Assessment regulations[22];*
- *Scottish Government 2025 National Planning Framework 4: Policy 22 (flood risk and water management) – Chief Planner letter, June 2025[23];*
- *Aberdeenshire Local Development Plan 2023[24] Policy C4 Flooding* and *Policy PR1 Protecting Important Resources;*
- *Aberdeenshire Council 2023 Buffer Strips - Planning advice PA2023-16[25]*, updated March 2025;
- *Angus Council Local Development Plan[26] – Policy PV12: Managing Flood Risk* (adopted September 2016);
- *Angus Council: Technical Guidance for Developers and Regulators: Flood Risk and Surface Water Drainage Requirements*, September 2023[27];
- SEPA: *Policy No. 19, Groundwater protection policy for Scotland, 2009[28]*;
- SEPA's *Guidance for Pollution Prevention* (GPPs)[29], including:
  - GPP1: Understanding your environmental responsibilities – good environmental practices;
  - GPP2: Above ground oil storage tanks;
  - GPP5: Works and maintenance in or near water;
  - GPP6: Working at construction and demolition sites;
  - GPP8: Safe storage and disposal of used oils;
  - GPP21: Pollution incident response planning;
  - GPP22: Dealing with spills; and
  - GPP26: Safe storage – drums and intermediate bulk containers.

[20] Scottish Government (2023) National Planning Framework 4 (NPF4) [online]. Available at: https://www.gov.scot/publications/national-planning-framework-4/documents/ [Accessed: 20 May 2025].
[21] Scottish Government (2017) Planning Advice Note 1/2013: Environmental Impact Assessment. [online]. Available at: https://www.gov.scot/publications/planning-advice-note-1-2013-environmental-impact-assessment/documents/ [Accessed: 20 May 2025].
[22] Scottish Government (2017) Planning Circular 1/2017: Environmental Impact Assessment regulations. [online]. Available at: https://www.gov.scot/publications/planning-circular-1-2017-environmental-impact-assessment-regulations-2017/documents/ [Accessed: 20 May 2025].
[23] Scottish Government (2025) National Planning Framework 4: Policy 22 (flood risk and water management) – Chief Planner letter – June 2025. [online]. Available at: https://www.gov.scot/publications/national-planning-framework-4-policy-22-flood-risk-and-water-management-chief-planner-letter-june-2025/ [Accessed: 8 July 2025].
[24] Aberdeenshire Local Development Plan (2023) [online]. Available at: https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2023/ [Accessed: 20 May 2025].
[25] Aberdeenshire Council (2023) Buffer Strips - Planning advice PA2023-16 [online]. Available at: https://aberdeenshirestorage.blob.core.windows.net/acblobstorage/f9c96bec-ef21-4260-b215-c4bffad07666/pa2023-16-planning-advice-buffer-strips.pdf [Accessed: 20 May 2025].
[26] Angus Council Local Development Plan adopted September 2016. [online]. Available at: https://www.angus.gov.uk/media/angus_local_development_plan_adopted_september_2016 [Accessed: 20 May 2025].
[27] Angus Council (2023 Technical Guidance for Developers and Regulators: Flood Risk and Surface Water Drainage Requirements [online]. Available at: https://www.angus.gov.uk/media/technical_guidance_for_developers_and_regulators_flood_risk_pdf [Accessed: 20 May 2025].
[28] SEPA (2009), Groundwater Protection Policy for Scotland v3, Environmental Policy No.19. [pdf]. Available at: https://www.sepa.org.uk/media/34371/groundwater-protection-policy-for-scotland-v3-november-2009.pdf [Accessed 20 May 2025].
[29] Natural Resources Wales (NRW) Northern Ireland Environment Agency (NIEA), SEPA, Guidance for Pollution Prevention (GPPs 1,2,5,6,8,21,22,26) [online]. Available at: https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/ [Accessed: 20 May 2025].

- SEPA: Statement on SEPA approach to National Planning Framework 4 Policy 22 exceptions, May 2025[30];
- SEPA: Summary note: SEPA input to Scottish Government Short Life Working Group on National Planning Framework 4 Policy 22: Flood Risk and Water Management, May 2025[31];
- SEPA: *Technical Flood Risk Guidance for Stakeholders*, version 13 (SEPA, June 2022)[32];
- SEPA: *The Water Environment (Controlled Activities) (Scotland) Regulations. A Practical Guide v9.4*, July 2024[33];
- SEPA: *Position Statement to support the implementation of the Water Environment (Controlled Activities) (Scotland) Regulations 2011,* WAT-PS-06-02*: Culverting of Watercourses – Position Statement and Supporting Guidance, Version 2*, June 2015[34];
- SEPA: *Engineering in the Water Environment Good Practice Guide – River Crossings,* WAT-SG-25, 2010[35];
- SEPA: *Engineering in the Water Environment Good Practice Guide – Temporary Construction Methods,* WAT-SG-29, 2009[36];
- SEPA: *Engineering in the Water Environment: Good Practice Guide – Sediment Management*, WAT-SG-26, 2010[37];
- SEPA: *Controlled Activities Regulations (CAR) Flood Risk Standing Advice for Engineering, Discharge and Impoundment Activities*[38], no date;
- SEPA: *Flood Risk Standing Advice for Planning Authorities*, July 2024[39];
- SEPA: *Sector Specific Guidance: Water Run-Off from Construction Sites*, WAT-SG-75, 2021[40];
- SEPA: *Special requirements for civil engineering contracts for the prevention of pollution*, WAT-SG-31, 2006[41];
- SEPA: *Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems*, 2024[42];
- SEPA: *Guidance on Assessing the Impacts of Developments on Groundwater Abstractions*, 2024[43];

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[30] SEPA (2025) Statement on SEPA approach to National Planning Framework 4 Policy 22 exceptions, May 2025. [online]. Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.sepa.org.uk%2Fmedia%2Fxfkdqibf%2Fstatement-sepa-approach-national-planning-framework-4-policy-22-exceptions.docx&wdOrigin=BROWSELINK [Accessed: 8 July 2025].

[31] SEPA (2025) Summary note: SEPA input to Scottish Government Short Life Working Group on National Planning Framework 4 Policy 22: Flood Risk and Water Management, May 2025. [online]. Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.sepa.org.uk%2Fmedia%2Fzknfztms%2Fsepa-input-npf4-policy-22-working-group.docx&wdOrigin=BROWSELINK [Accessed: 8 July 2025].

[32] SEPA (2022), Technical Flood Risk Guidance for Stakeholders, version 13 [online]. Available at: https://www.sepa.org.uk/media/162602/ss-nfr-p-002-technical-flood-risk-guidance-for-stakeholders.pdf [Accessed 20 May 2025].

[33] SEPA (2024), The Water Environment (Controlled Activities) (Scotland) Regulations. A Practical Guide v9.4 [online]. Available at: https://www.sepa.org.uk/regulations/water/engineering/ [Accessed 20 May 2025]

[34] SEPA (2015), Position Statement to support the implementation of the Water Environment (Controlled Activities) (Scotland) Regulations [online]. Available at: https://www.sepa.org.uk/media/150919/wat_ps_06_02.pdf [Accessed 20 May 2025].

[35] SEPA (2010), WAT-SG-25: Engineering in the Water Environment Good Practice Guide – River Crossings [pdf] [online]. Available at: https://www.sepa.org.uk/media/151036/wat-sg-25.pdf [Accessed 20 May 2025].

[36] SEPA (2009), WAT-SG-29: Engineering in the Water Environment Good Practice Guide – Temporary Construction Methods [pdf] [online]. Available at: https://www.sepa.org.uk/media/150997/wat_sg_29.pdf [Accessed 20 May 2025].

[37] SEPA (2010), WAT-SG-26: Engineering in the Water Environment: Good Practice Guide – Sediment Management [pdf] [online]. Available at: https://www.sepa.org.uk/media/151049/wat-sg-26.pdf [Accessed 20 May 2025].

[38] SEPA (no date), Controlled Activities Regulations (CAR) Flood Risk Standing Advice for Engineering, Discharge and Impoundment Activities [pdf] [online]. Available at: https://www.sepa.org.uk/media/94134/car-flood-risk-standing-advice-for-engineering-discharge-and-impoundment-activities.pdf [Accessed 20 May 2025].

[39] SEPA (2024), Flood Risk Standing Advice for Planning Authorities [online]. Available at: https://www.sepa.org.uk/media/nckhycrj/flood-risk-standing-advice.docx [Accessed 20 May 2025].

[40] SEPA (2021), Sector Specific Guidance: Water Run-Off from Construction Sites (WAT-SG-75) [online]. Available at: https://www.sepa.org.uk/media/340359/wat-sg-75.pdf [Accessed 20 May 2025].

[41] SEPA (2006), WAT-SG-31: Prevention of Pollution from Civil Engineering Contracts: Special Requirements. Available at: https://www.sepa.org.uk/media/152220/wat_sg_31.pdf [Accessed 20 May 2025]

[42] SEPA (2024), Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems [online]. Available at: https://www.sepa.org.uk/media/a1yh0blq/guidance-on-assessing-the-impacts-of-developments-on-groundwater-dependent-terrestrial-ecosystems.docx [Accessed 20 May 2025].

[43] SEPA (2024), Guidance on Assessing the Impacts of Developments on Groundwater Abstractions [online]. Available at: https://www.sepa.org.uk/media/mfzpnjwb/guidance-on-assessing-the-impacts-of-developments-on-groundwater-abstractions.docx [Accessed 20 May 2025].

- SEPA: *Flood Risk and Land Use Vulnerability Guidance*, July 2024[44];
- SEPA: *Climate change allowances for flood risk assessment in land use planning, version 6*, 2025[45];
- SEPA: SEPA's Triage Framework. *Guidance for Planning Authorities and SEPA*. December 2022[46];
- SEPA: *Recommended Riparian Corridor Layer for use in Land Use Planning*, July 2024[47];
- SEPA: *Regulatory Position Statement – Developments on Peat*, 2010[48];
- Scottish Water standards and policies, including *Sewers for Scotland 4th edition*, 2018[49] and *Water for Scotland 4th edition*, 2018[50];
- Forest Research: *The UK Forestry Standard, 5th Edition*, Forestry Commission, Scottish Forestry, Natural Resources Wales & Forest Service, 2023[51];
- Construction Industry Research and Information Association (CIRIA): *The SuDS Manual* (C753) 2015[52];
- CIRIA: *Control of water pollution from construction Sites: Guidance for consultants and contractors* (C532) 2001[53];
- CIRIA: *Control of water pollution from linear construction projects*. *Site guide* (C649), 2006[54] and *Technical guidance* (C648), 2006[55];
- CIRIA: *Groundwater Control – design and practice* (C515) 2016[56];
- Scottish Government, Scottish Natural Heritage & SEPA*: Peatland Survey – Guidance on Developments on Peatland,* 2017[57];
- Scottish Natural Heritage (SNH) (now NatureScot): *Constructed tracks in the Scottish Uplands*, 2015[58]; and
- Scottish Government (2017) *Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity Generation Developments (Second Edition)*, Scottish Government[59].

13.3.3 In undertaking the assessment, the Applicant's duties (including those under the *EIA Regulations* and *Schedule 9* to the *Electricity Act*) have been taken into account and consideration has been given to the scoping and pre-consultation responses

[44] SEPA (2024), Flood Risk and Land Use Vulnerability Guidance [online]. Available at: https://www.sepa.org.uk/media/ht3bsekc/land-use-vulnerability-guidance.docx [Accessed: 20 May 2025].
[45] SEPA (2025), Climate change allowances for flood risk assessment in land use planning Version 6 [online]. Available at: https://www.sepa.org.uk/media/jjwpxuso/climate-change-allowances-guidance_v6.pdf [Accessed 20 May 2025]
[46] SEPA (2022), SEPA's Triage Framework. Guidance for Planning Authorities and SEPA [pdf]. Available at: https://www.sepa.org.uk/media/594101/sepa-triage-framework-and-standing-advice.pdf [Accessed 20 May 2025].
[47] SEPA (2024), Recommended Riparian Corridor Layer for use in Land Use Planning [online]. Available at: https://www.sepa.org.uk/media/puqhuwhn/recommended-riparian-corridor-note.docx [Accessed 20 May 2025].
[48] SEPA (2010) Regulatory Position Statement – Developments on Peat. [online]. Available at: https://www.sepa.org.uk/media/143822/peat_position_statement.pdf [Accessed 20 May 2025].
[49] Scottish Water (2018), Sewers for Scotland v4.0 – A technical specification for the design and construction of sewerage infrastructure [online]. Available at: https://www.scottishwater.co.uk/Business-and-Developers/Connecting-to-Our-Network/Waste-Water-Connection/www.scottishwater.co.uk/-/media/ScottishWater/Document-Hub/Business-and-Developers/Connecting-to-our-network/All-connections-information/SewersForScotlandv4.pdf [Accessed 20 May 2025].
[50] Scottish Water (2018), Water for Scotland v4.0 – A technical specification for developers in Scotland [online]. Available at: https://www.scottishwater.co.uk/-/media/ScottishWater/Document-Hub/Business-and-Developers/Connecting-to-our-network/All-connections-information/150219WaterForScotlandV4.pdf [Accessed 20 May 2025].
[51] Forest Research (2023) The UK Forestry Standard. Forest Research, Farnham, Fifth Edition [online]. Available at: https://www.forestresearch.gov.uk/tools-and-resources/fthr/uk-forestry-standard/ [Accessed 20 May 2025].
[52] Woods Ballard, B., Wilson, S., Udale-Clarke, H. et al., (2015) CIRIA: The SuDS Manual (C753). CIRIA.
[53] Masters-William, H. (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA.
[54] Murnane, E, Heap, A, Swain, A (2006) Control of water pollution from linear construction projects. Site guide (C649) CIRIA.
[55] Murnane, E, Heap, A, Swain, A (2006) Control of water pollution from linear construction projects. Technical guide (C648) CIRIA.
[56] Preene, M., Roberts T. O. L., Powrie, W. (2016) Groundwater control: design and practice (2nd edition) (C750). CIRIA.
[57] Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only. Available at: https://www.gov.scot/publications/peatland-survey-guidance/ [Accessed 20 May 2025].
[58] Scottish Natural Heritage (2015) Constructed tracks in the Scottish Uplands. Available at: https://www.nature.scot/doc/archive/constructed-tracks-scottish-uplands [Accessed 20 May 2025].
[59] Scottish Government (2017) Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity Generation Developments (Second Edition). Available at: https://www.gov.scot/publications/peat-landslide-hazard-risk-assessments-best-practice-guide-proposed-electricity/ [Accessed 20 May 2025].

as detailed in **Table 13.1: Summary of Relevant Consultation**. A full summary of consultation is provided in **Volume 1, Chapter 6: Scope and Consultation**.

Table 13.1: Summary of Relevant Consultation[60]

Consultee and Date	Scoping/ Other Consultation	Issue Raised	How Issue has been Addressed
Scottish Government Energy Consents Unit (ECU) 19 December 2024	Scoping Opinion	Scottish Ministers request that the Applicant contacts Scottish Water to confirm whether there any Scottish Water assets which may be affected by the development. Details of any relevant mitigation measures to be provided should be included in the EIAR.	The Applicant has obtained Scottish Water asset drawings for the Proposed Development and these have been considered in the design development.
	Scoping Opinion	Scottish Ministers request that the Applicant investigates the presence of any PWS which may be impacted by the development. The EIAR should include details of any supplies identified by this investigation, and if any supplies are identified, the Applicant should provide an assessment of the potential impacts, risks, and any mitigation which would be provided.	A detailed assessment of PWS was undertaken to inform the baseline and effects assessment. PWS data was collected via consultation with the local authorities, SEPA and residents (via questionnaires, consultation events and site visits to properties). The PWS baseline and assessment is provided in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment** and summarised in this Chapter.
	Scoping Opinion	The Marine Directorate – Science Evidence Data and Digital (MD-SEDD) provide generic scoping guidelines for OHL development which outline how fish populations can be impacted during the construction, operation and decommissioning of a wind farm or OHL development and informs developers as to what should be considered, in relation to freshwater and diadromous fish and fisheries, during the EIA process.	Noted. A separate assessment of potential effects on migratory fish was conducted and is reported in **Volume 5, Appendix 12.3: Shadow Habitats Regulations Appraisal. Annex 12.3.2: Electromagnetic Field Effects on Fish and Freshwater Pearl Mussel**. Embedded, Applied and Additional Mitigation measures set out in detail in this chapter will minimise the risk of pollution/siltation of downstream watercourses, which will also serve to protect fish and fisheries.
	Scoping Opinion	In addition to identifying the main watercourses and waterbodies within and downstream of the Proposed Development area, developers should identify and consider, at this early stage, any areas of Special Areas of Conservation (SAC) where fish are a qualifying feature and proposed felling operations particularly in acid sensitive areas.	Effects on downstream receptors, including SAC, are considered in the effects assessment in this Chapter and **Volume 2, Chapter 11: Ecology**. The potential for silt/sediment runoff and effects on water quality are assessed and presented in this Chapter.
	Scoping Opinion	Scottish Ministers consider that where there is a demonstrable requirement for peat landslide hazard and risk assessment (PLHRA), the assessment should be undertaken as part of the EIA process. The *Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation*	Peat was avoided to the extent feasible in the design development. There are a few areas where peat could not be fully avoided, which are described in **Volume 5, Appendix 13.3: Peat Depth Survey Report** and **Appendix 13.4: Outline Peat**

60 Responses from the Community Councils are not included in Table 13.1, as the ECU Scoping Opinion (19 December 2024) notes that 'the issues raised by Community Councils that merit inclusion within the EIAR are either addressed through this scoping opinion, or responses by other stakeholders'. Therefore, the relevant issues regarding hydrology, hydrogeology and peat have been covered by the scoping opinion/other stakeholders and are addressed herein.

Consultee and Date	Scoping/ Other Consultation	Issue Raised	How Issue has been Addressed
		Developments (Second Edition), should be followed in the preparation of the EIAR. Where a PLHRA is not required clear justification for not carrying out such a risk assessment is required.	**Management Plan**. A PLHRA has been undertaken and is presented in **Volume 5, Appendix 13.6: Peat Landslide Hazard and Risk Assessment**.
	Scoping Opinion	Scottish Ministers request that the EIAR should include detailed information on on-site borrow pits or local quarries, which will provide materials.	Borrow pits have not been included as part of this EIAR. The final location and design of any borrow pits and quarries that may be necessary for construction would be confirmed by the Principal Contractors and separate planning permissions would be sought as required. For the purpose of the assessment in Volume 2, Chapter 14 Traffic and Transport it has been assumed that all stone would be imported as a worst case scenario.
Aberdeenshire Council 15 October 2024	Formal Scoping Consultation	The Council's Flood Risk and Coastal Protection Team comment that "*Flood Risk is not definable at this stage, but drainage details and flood risk assessments may/will need to be provided to demonstrate how surface water will be managed depending on the final locations of site works*."	Flood risk areas have been identified using SEPA Future Flood maps. Flood risk areas have been avoided, where practicable. Therefore, stand-alone flood risk assessments are not required. Flood risk and surface water management are discussed in this Chapter.
Angus Council 9 October 2024	Formal Scoping Consultation	The Council's environmental protection officer notes the approach to considering land contamination and provides additional comment in relation to that matter, having regard to the location of farmsteads, airfields or military sites and former railway lines. The Council's roads (flooding/drainage) team did not provide a scoping consultation response.	A Phase 1 Geo-environmental Preliminary Risk Assessment has been carried out for each section of the Proposed Development. The reports are appended in **Volume 5, Appendix 13.7: Contaminated Land Reports** and used to inform the baseline.
NatureScot 9 October 2024	Formal Scoping Consultation	NatureScot recommend the requirements of NPF4 regarding biodiversity enhancement are adopted as part of any future applications, however they are aware that the Applicant is currently considering opportunities for biodiversity enhancement.	Biodiversity net gain (BNG) is covered in **Volume 2, Chapter 11: Ecology**. Principles relating to biodiversity enhancement are provided in **Volume 5, Appendix 11.5: Outline Biodiversity Enhancement Plan**. The Applicant will engage/investigate in biodiversity opportunities with SEPA and NatureScot that provide riparian planting along natural watercourses (eg the Bervie Water, Cowie Water, Luther Water and River Dee).
		NatureScot note that the Proposed Development may have an impact upon protected areas and NatureScot are advising SSEN Transmission on the best design and mitigation measures to try to avoid significant adverse effects on protected features. NatureScot hope that in most cases considerate design and implementation of best practices will avoid significant adverse effects.	Protected areas were avoided during the routeing and alignment stages. However, the Proposed Development is close to several protected sites. The effects have been assessed and mitigation measures set out in this Chapter for hydrological and geological protected areas.

Consultee and Date	Scoping/ Other Consultation	Issue Raised	How Issue has been Addressed
NatureScot 21 November 2024	Alignment Consultation Response	NatureScot provide detailed feedback on protected areas that could be affected by the alignment. Key issues related to hydrology and geological protected areas include:	
		River Tay SAC – the Proposed OHL crosses the River Tay SAC at two locations on tributaries of the River Tay. Given the scale of the work in relation to the SAC, NatureScot do not consider there will be long-term impacts to the qualifying interests, provided standard mitigation measures are followed. NatureScot understand that the OHL will span the river and SAC boundary and therefore there should be no direct effects on the designated species and indirect effects should be avoided through general mitigation measures.	**River Tay SAC**: Standard mitigation will be implemented at the OHL crossings within the River Tay SAC. Further consultation was carried out with NatureScot and mitigation measures agreed. These are discussed in **Section 13.5: Mitigation and Monitoring** of this Chapter. The OHL will span the river and SAC boundary.
		River South Esk SAC - The River South Esk SAC is intersected by the OHL at two locations. NatureScot note that it is likely that Atlantic salmon will be present at the OHL crossing locations and there may be freshwater pearl mussel (*Margaritifera margaritifera*) (FWPM). However, NatureScot note that SSEN Transmission do not intend to enter the water and therefore no FWPM survey would be required. Appropriate bankside construction mitigation methods should be followed, and standard mitigation measures should be implemented during construction to avoid excess silt and pollutants into the river. NatureScot understand that the OHL will span the river and SAC boundary and therefore there should be no direct effects on the designated species and indirect effects should be avoided through general mitigation measures.	**River South Esk SAC:** Standard mitigation will be implemented at the OHL crossings within the River Tay SAC. Further consultation was carried out with NatureScot and mitigation measures agreed. These are discussed in **Section 13.5: Mitigation and Monitoring** of this Chapter. The OHL will span the river and SAC boundary.
		North Esk and West Water Palaeochannels SSSI NatureScot note that the OHL will not traverse the Geological Conservation Review (GCR)/SSSI area and there is over 500 m between the southern-most corner of the designated area and the closest tower. Therefore, NatureScot conclude that the natural heritage features of the SSSI will not be affected by the proposal. The tower construction works are downstream of the SSSI and so there will be no temporary indirect impacts on sedimentation from the development affecting the SSSI. NatureScot note that there is an extensive suite of palaeochannels outside the SSSI boundary, which form part of the same suite of landforms and add wider context	**North Esk and West Water Palaeochannels SSSI:** Further consultation was undertaken with NatureScot to identify the palaeochannels, based on analysis on Light, Detection, and Ranging (LIDAR) topographic data. This constraints information was used to site the towers, such that the towers and working areas avoided the palaeochannels as much as practicable (see **paragraphs 13.6.90** and **13.6.91**).

Consultee and Date	Scoping/ Other Consultation	Issue Raised	How Issue has been Addressed
		to the SSSI features. NatureScot recommend that the towers should ideally be sited on the large flat terraces, avoiding obvious palaeochannels. NatureScot are happy to work with SSEN Transmission to further support micrositing the tower bases to avoid the channels.	
		The **River Dee SAC** is intersected by the alignment options in three locations. It is likely that Atlantic salmon (*Salmo salar*) and otter (*Lutra lutra*) are present at all river crossing options. FWPM have been found immediately downstream of the alignment and so appropriate bankside construction mitigation methods should be followed. Standard mitigation measures should be implemented during the construction work to avoid excess silt and pollutants entering the water, including compliance with both project-wide and site-specific environmental management procedures. NatureScot understand that the OHL will span the river and SAC boundary.	**River Dee SAC:** Standard mitigation will be implemented at the OHL crossings within the River Tay SAC. Further consultation was carried out with NatureScot and mitigation measures agreed. These are discussed in **Section 13.5** of this Chapter. The OHL will span the river and SAC boundary.
		Loch of Park SSSI Although ecological and hydrological survey results suggested that no GWDTE were identified adjacent to or supplying Loch of Park SSSI, NatureScot note that the construction and maintenance of the Proposed Development must not disrupt the quality or quantity of water supplying the SSSI. Survey work may be needed to support this outcome in addition to micrositing and appropriate construction methods.	There are no GWDTE identified adjacent to or supplying Loch of Park SSSI. Further assessment of effects and mitigation for the Loch of Park SSSI is provided within **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment**, and the mitigation is outlined in **Table 13.22: Committed Additional Mitigation Construction** of this Chapter (see mitigation measure HG57).
		NatureScot note that Proposed Development may have direct or indirect impacts on carbon-rich soils which do not currently support peatland habitats but may need to be taken into consideration when assessing the broader impacts of the proposal. NatureScot note that as their *Carbon and Peatland Map* (2016) is indicative, peat depth surveys should be carried out and would welcome a methodology consistent with other OHL EIAs, and, as such SSEN Transmission would be open to further discussion on the development of project specific streamline approach due to the linear nature of the development. Data such as the *JHI Soil Map (Partial Coverage)* and interpreted derived data such as the *Map of soil phosphorus sorption capacity* could support the survey methodology.	A peat survey was carried out in areas of the Proposed Development where peat or carbon-rich soils were likely based on a review of the NatureScot (2016) *Carbon and Peatland Map* and soil maps from the James Hutton Institute. The peat survey report is **Volume 5, Appendix 13.3: Peat Depth Survey Report**. SEPA were consulted regarding the approach to the peat survey in a pre-application meeting on 8 August 2024 and agreed with the survey approach (see below).
SEPA		SEPA note that to avoid delay and potential objection the EIA submission must contain	**Volume 3, Figures 13.2.1 – 13.2.26: Hydrology, Flood Risk and Buffers** and

Consultee and Date	Scoping/ Other Consultation	Issue Raised	How Issue has been Addressed
9 October 2024	Formal Scoping Consultation	a series of scale drawings of sensitivities, for example peat depth, peat condition, GWDTE, proximity to watercourses, proximity to PWS overlain with the Proposed Development. This is necessary to ensure the EIA process has informed the layout of the development to firstly avoid, then reduce and then mitigate significant impacts on the environment. SEPA request that the issues detailed in the attached **Appendix 1** (and summarised below) be addressed in the EIA. SEPA note that there may be opportunities to scope out some of the issues depending on the Site:	**Figures 13.8.1 to 13.8.26: Probe Depths** within this Chapter provide information on the sensitive receptors relating to hydrology, PWS, GWDTE and peat overlain with the Site layout of the Proposed Development at a suitable scale and the recommended buffers. Peat condition was assessed during the site surveys and is discussed in the Chapter and **Volume 5, Appendix 13.3: Peat Depth Survey Report** and **Appendix 13.4: Outline Peat Management Plan (PMP).**
		1. Site Layout: Figures must detail all proposed upgraded, temporary and permanent infrastructure. This includes all access tracks, excavations, buildings, site compounds, laydown areas, storage areas and any other built elements.	It is noted that existing access tracks have been used to the extent feasible to minimise new works on previously undisturbed ground.
		2. Water Environment: The proposals should demonstrate how impacts on local hydrology have been minimised and the Site layout 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. Figures should show a minimum buffer of 10 m around each loch or watercourse and the Applicant should refer to SEPAs Recommended Riparian Buffer data for the relevant minimum buffer for an individual watercourse. If this minimum buffer cannot be achieved each breach must be numbered on a plan with an associated photograph of the location, dimensions of the loch or watercourse and drawings of what is proposed in terms of engineering works. Guidance on the design of water crossings can be found in the Construction of River Crossings Good Practice Guide[35].	Watercourse buffers are shown on **Volume 3, Figures 13.2.1 – 13.2.26: Hydrology, Flood Risk and Buffers** and were used to constrain the design development, to the extent feasible. Locations where the recommended buffers could not be achieved are detailed in **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**. The recommended Construction of River Crossings Good Practice Guide has been followed for new watercourse crossings, along with advice from NatureScot to minimise the effects on sensitive receptors.
		3. Flood Risk: Advice on flood risk is available in SEPA (2024) *Flood Risk Standing Advice for Planning Authorities*[39] and *SEPA Controlled Activities Regulations (CAR) Flood Risk Standing Advice for Engineering, Discharge and Impoundment Activities*[38]. 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. If it is considered the development could result in an increased risk of flooding to a	The Applicant has followed SEPA's advice and guidance related to flood risk. Flood risk areas have been identified based on SEPA Future Flood maps and have been avoided, where practicable. New watercourse crossings will be designed to accommodate the 0.5% annual exceedance probability flows (1 in 200 year) (with an appropriate allowance for climate change) where practicable. Temporary crossings will be designed to pass the 1 in 30 year flow where practicable, or to maintain and not reduce the existing capacity of the channel. Details of watercourse

Consultee and Date	Scoping/ Other Consultation	Issue Raised	How Issue has been Addressed
		nearby receptor, then a flood risk assessment (FRA) must be submitted.	crossings are provided in **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**. At locations where new or upgraded crossings are not able to be designed to accommodate the 0.5% annual exceedance probability flows, justification and assessment has been provided in **Appendix 13.1**. Effects on flood risk have been assessed in this Chapter, and it is considered that the Proposed Development will not result in an increased flood risk to nearby receptors. A full FRA is not considered necessary. A hydraulic modelling study has been undertaken for the watercourses close to the Diamond Crossing in Section F (the Gormack Burn and tributaries) to inform the detailed design of the watercourse crossings and to understand the flood risk in this area. The outcomes of this study have demonstrated that as there will be no land raising in the flood risk area, no flood protection measures will be required, there will not be an increased flood risk to other receptors; this is summarised in the appended Flood Modelling Study Report (**Volume 5, Appendix 13.8: Flood Modelling Study Report**). Based on a site specific assessment of each new temporary crossing in **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**, the crossings will not result in an increased flood risk to other receptors.
		4. Peat and Peatland: Where proposals are on peatland or carbon rich soils (CRS), the following figures should be submitted: • peat depth survey showing peat probe locations and depths. This must include adequate peat probing information to inform the Site layout in accordance with the mitigation hierarchy in NPF4, which may be more than that outlined in the *Peatland Survey – Guidance on Developments on Peatland* (2017)[57]; • peat depth survey and interpolated depths; and • peatland condition mapping. The figures should clearly demonstrate that development proposals avoid any near natural peatland and that all proposed excavation is on peat less than 1 m deep. It should be clearly demonstrated that the	A peat depth survey is provided in **Volume 5, Appendix 13.3: Peat Depth Survey Report** and reuse proposals in the Outline PMP described in **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP),** which follows all relevant guidance. Peatland condition was recorded during the peat survey and is reported in **Volume 5, Appendix 13.3: Peat Depth Survey Report** and summarised in the chapter. The development proposals have avoided all neat natural peatland and avoided the deepest areas of peat.

Consultee and Date	Scoping/ Other Consultation	Issue Raised	How Issue has been Addressed
		deepest areas of peat have been avoided and the volumes of peat excavated have been reduced as much as possible, first through layout and then by design making use of techniques such as floating tracks. An Outline PMP should be included and the consultation sets out what should be included.	
		5. GWDTE and existing groundwater abstractions: The following figures and information on GWDTE and abstractions should be submitted: • GWDTE and existing groundwater abstractions, including buffers which show that they are outwith a 100 m radius of all excavations shallower than 1 m and outwith 250 m of all excavations deeper than 1 m and proposed groundwater abstractions; • If the minimum buffers cannot be achieved, a detailed site specific qualitative and/or quantitative risk assessment will be required based on guidance in SEPA (2024)[42, 43]; and • A National Vegetation Classification (NVC) survey for all areas within the relevant GWDTE buffers and any proposed micrositing limits.	GWDTEs and existing groundwater excavations were avoided to the extent feasible during design development. The assessment on GWDTE and existing groundwater excavations, including PWS is presented in **Volume 5**, **Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment** and **Appendix 13.5: GWDTE Assessment**.
		6. Forest removal and forest waste: 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. Figures with the boundaries of where felling will take place and a description of what is proposed for this timber should be provided.	Forestry felling has been minimised to the extent feasible and is described in detail in **Volume 2, Chapter 8: Forestry**. The effects of forestry felling and appropriate mitigation is discussed in this Chapter.
		7. Pollution prevention and environmental management: The submission must include a schedule of mitigation, which includes reference to best practice pollution prevention and construction techniques. The discarding of materials as waste should be avoided.	A schedule of mitigation is included in **Volume 2, Chapter 17: Schedule of Mitigation**. The management of waste is described in **Volume 5, Appendix 3.4: Outline CEMP**, and the GEMPs and SPPs (in **Volume 5, Appendix 3.2: General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs)**).
		SEPA provided the following site-specific comments: • Detailed peat probing will only be required within the micrositing limits of excavations for the towers and any associated infrastructure if Phase 1 peat surveys indicate the possibility of peat in that location; and • there are a number of former airfields nearby which, due to potential radioactive contamination from their	This was noted and the requirement for peat probing will be reviewed where any micro-siting works are proposed in light of Phase 1 peat survey finding (see **Volume 5, Appendix 13.3: Peat Depth Survey Report**). A Phase 1 Geo-environmental Preliminary Risk Assessment (**Volume 5, Appendix 13.7 Contaminated Land Reports**) has been undertaken to

Consultee and Date	Scoping/ Other Consultation	Issue Raised	How Issue has been Addressed
		historic land use, may lead to the requirement for additional contaminated land investigations if any excavations are proposed within 1 km radius of these sites.	identify potential risks from soil and groundwater contamination that may affect the Proposed Development. The Preliminary Risk Assessments conclude that there is a low risk with respect to contaminated land. The Preliminary Risk Assessment also include radium sensitive zones associated with former airfields. Edzell airfield (former RAF site in Section C) and Fordoun airfield (former RAF site in Section D) are within 1 km of the Proposed Development however, the Preliminary Risk Assessments conclude that the risks associated with radium are considered low. Further intrusive investigation may be required with respect to the former RAF Edzell site, this would be considered further by the Principal Contractor.
SEPA 8 August 2024	Pre-Application Consultation Meeting	SEPA confirm that the Applicant should use SEPA's recommended riparian corridor buffers for the Proposed Development and also meet buffer requirements for Angus and Aberdeenshire Council, including geomorphic risk buffers. SEPA note that watercourse buffers required for temporary access tracks are of a lesser concern, however, it would be important to ensure access tracks are not land raised if in flood risk areas (even if temporary). Any existing permanent access upgrading should take place on the opposite side of the existing track and not reduce existing buffers where possible.	The relevant buffers were used as constraints to early project design and are shown in **Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk, and Buffers.** An assessment of effects and additional mitigation at locations where watercourse buffers were not achieved is provided in **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**.
		SEPA confirmed that the OHL towers should be outwith flood risk areas (based on SEPA Future Flood mapping) where possible and no land-raising should be undertaken in flood risk areas.	Future Flood Risk areas were avoided to the extent feasible. An assessment of towers and infrastructure within flood risk areas is included in this Chapter, along with mitigation measures. There will be no land-raising undertaken within flood risk areas.
		SEPA note that PWS source locations will be required for the EIA submission within 250 m of the proposed works if excavations are greater than 1 m depth and within 100 m for excavations less than 1 m.	A comprehensive PWS assessment was carried out and is presented in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment**, with effects and mitigation measures summarised in this Chapter.
		SEPA accept that detailed peat probing was carried out around towers only and wider Phase 1 peat probing hasn't been done in some areas due to access restrictions. If peat cannot be avoided, the Applicant must demonstrate how they have microsited to minimise impacts.	Peat was avoided as much as practicable and tower positions/working areas microsited to avoid deeper peat. Over the whole Proposed Development there are two towers (N77 and N78) where peat could not be fully avoided (see **Volume**

Consultee and Date	Scoping/ Other Consultation	Issue Raised	How Issue has been Addressed
			5, Appendix 13.4: Outline Peat Management Plan (PMP).
		SEPA note that permanent access tracks should be subject to peat probing if they are on peat indicated by desk-based mapping. If temporary access is used and floated, then peat survey isn't required (unless there is good condition peatland vegetation, eg Class 1 and 2). SEPA will require a survey of peatland condition if temporary accesses are on Class 1 and 2.	Peat probing on permanent access tracks in the peat areas was carried out. Class 1 and 2 peatland was fully avoided in the early design and no temporary accesses cross Class 1 and 2 peatlands (see **Volume 3, Figures 13.7.1 to 13.7.7: Carbon and Peatland Classification (NatureScot, 2016)** and **Volume 5, Appendix 13.3: Peat Depth Survey Report**).
		SEPA note that overall the design should show avoidance of peat as a requirement of NPF4 mitigation hierarchy. Peat excavation should be minimised as far as possible, if peat has to be reused for reinstatement, then it has to be used in a way allowing for it to function as a peatland afterwards (eg not being spread/created into bunds etc and to tie into the water table).	Noted, the NPF4 mitigation hierarchy and reuse and reinstatement proposals for any excavated peat is described in detail in **Volume 5**, **Appendix 13.4: Outline Peat Management Plan (PMP)** and the approach to re-use of peat in two locations in Section E of the Proposed Development where peat cannot be completely avoided is summarised in **Section 13.6** of this Chapter.
SEPA 27 February 2025	Gate Check Consultation	SEPA highlighted that their LUPS 31 Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (2017) has been updated and replaced by the following two documents: • Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems[42]; and • Guidance on Assessing the Impacts of Developments on Groundwater Abstractions[43].	The assessment of impacts on groundwater abstractions/private water supplies and groundwater dependent terrestrial ecosystems in this Chapter now follows the updated SEPA guidance, as requested.
Scottish Water 1 October 2024 and Scottish Water 18 November 2024	Formal Scoping Consultation and Formal Alignment Consultation	Scottish Water state that a review of records indicates that the proposed activity falls partly within two drinking water catchments where a Scottish Water abstraction is located. Scottish Water abstractions are designated as Drinking Water Protected Areas (DWPA) under Article 7 of *the Water Framework Directive*. The River Dee (Inchgarth) supplies Mannofield Water Treatment Works (WTW) and the River Tay supplies Perth Gowans Terrace WTW; therefore, it is essential that water quality and water quantity in the area are protected.	The Proposed Development is not within the River Dee or River Tay DWPAs. The DWPA on the River Tay and River Dee are ~ 32 km and ~ 10 km downstream of the Proposed Development, respectively, so there is no potential for likely significant effects. A small part (access tracks) of the Proposed Development is within the Buttery Burn DWPA. Scottish Water surface water DWPA are shown in **Volume 3, Figures 13.3.1 to 13.3.15: Groundwater Abstractions, Water Supplies and GWDTE** and discussed in the assessment, along with appropriate mitigation measures and precautions.

Consultee and Date	Scoping/ Other Consultation	Issue Raised	How Issue has been Addressed
		Scottish Water have produced a list of precautions for a range of activities. This details protection measures to be taken within a DWPA, the wider drinking water catchment and if there are assets in the area. Scottish Water note that site specific risks and mitigation measures will require to be assessed and implemented. These documents and other supporting information can be found on the activities within the catchments page of the website at http://www.scottishwater.co.uk/slm.	Water quality and pollution prevention measures are proposed to account for the sensitive receptors. Scottish Water will be kept informed should any incidents occur; this and the fact that a small part of the Proposed Development is within a drinking water catchment is documented in **Volume 5**, **Appendix 3.4: Outline Construction Environmental Management Plan (CEMP)**
		A review of records indicates that there are multiple Scottish Water assets in the areas detailed. The assets and their importance should be confirmed through obtaining plans from Scottish Water Asset Plan Providers.	The Applicant has obtained Scottish Water asset plans for the Proposed Development area. Scottish Water assets were considered and avoided, to the extent feasible, during design development. The Applicant and Principal Contractors will maintain consultation with Scottish Water before and during construction to be cognisant of all assets.
Aberdeenshire Council 24 May 2024	Pre Application Advice Response	SEPA guidance should be followed to ensure proposals do not adversely affect the PWS that arise on or near the Proposed Development. The Council note that PWS information is to be obtained from the Council to ensure that the proposal does not adversely affect any existing PWS. Appropriate mitigation to be applied to any supplies found in the vicinity of the Proposed Development.	A comprehensive PWS assessment was carried out and is presented in **Volume 5**, **Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment**, with effects and mitigation measures summarised in this Chapter. PWS information was collected from Aberdeenshire, Aberdeen City and Angus Councils, SEPA and from questionnaires, site visits and public consultation.
		SEPA have identified potential Geomorphic Risk along the Bervie Water and Cowie Water and recommend a 20 m buffer minimum on each side of this watercourse. SEPA have identified potential Geomorphic Risk along the River Dee and recommend a 160 m buffer minimum on each side of this watercourse. Further geomorphic studies may be advisable for these crossings to ensure long-term viability of the infrastructure if close to the buffers.	The Applicant used SEPA's Geomorphic Risk Buffer shapefile as constraints to inform OHL routeing and initial design. This, along with other constraints (eg avoidance of wide flood risk areas) were used to identify suitable OHL crossing points and to inform tower siting close to watercourses. There is no proposed infrastructure within or close to the Geomorphic Risk Buffer on the Cowie Water or the Bervie Water. A minimum buffer of 30 m has been achieved for both these watercourses. The River Dee OHL crossing has been relocated since pre-application consultation and the proposed OHL crossing avoids the Geomorphic Risk area and all infrastructure is well outside relevant buffers. There is no proposed new permanent or temporary infrastructure within Geomorphic Risk Buffers. The exception is the use of existing bridges/culverts that already cross

Consultee and Date	Scoping/ Other Consultation	Issue Raised	How Issue has been Addressed
			watercourses within a buffer (eg the Gormack Burn).
		The Bervie Water, Cowie Water, Luther Water and River Dee have been identified as High priority for Riparian planting. SEPA would welcome the investigation into providing riparian planting along these watercourses in the biodiversity net gain opportunities for this development.	Principles relating to biodiversity enhancement are provided in **Appendix 11.5: Outline Biodiversity Enhancement Plan**. The Applicant will engage/investigate in biodiversity opportunities that provide riparian planting alongside these watercourses.

Desk Based Research and Data Sources

13.3.4 The following data sources have informed the assessment:

- Ordnance Survey mapping at 1:10,000, 1:25,000 and 1:50,000 scales;
- Aerial imagery of the Proposed Development location and surrounding area;
- British Geological Survey (BGS) online digital mapping at 1:50,000 and 1:625,000 scales[61];
- Scottish Soil mapping at 1:250,000 scale;
- NatureScot Carbon and Peatland 2016 mapping at 1:250,000 scale[62];
- The Flood Estimation Handbook (FEH) Web-service[63];
- SEPA Future Flood Maps[64];
- SEPA Recommended Riparian Corridor[65];
- SEPA Geomorphic Risk Buffer[66];
- SEPA Water Classification Hub[67];
- LIDAR data, downloaded from the Scottish Remote Sensing Portal and collected for the Proposed Development;
- Scotland's Environment Website and Interactive Map[68];
- NatureScot Site Link Interactive Map[69];
- Scottish Water Asset Plans of the Site[70];
- PWS Data provided by Aberdeenshire Council, Aberdeen City Council and Angus Council; and
- Licensed Abstraction Data provided by SEPA.

Field Survey

13.3.5 Multiple field surveys were carried out within the study area to inform the assessment between November 2022 and February 2025 to inform the development design and assessment. The results from the surveys are presented in **Appendix 13.1:**

[61] British Geological Survey (BGS) Online Digital Mapping [Online] Available at: https://www.bgs.ac.uk/geological-data/map-viewers/
[62] NatureScot, 2016. Map - Carbon and Peatland 2016 map. [Online] Available at: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/soils/carbon-and-peatland-2016-map.
[63] UK Centre for Ecology and Hydrology, n.d. Map - FEH Web Service. [Online] Available at: https://fehweb.ceh.ac.uk/Map.
[64] SEPA, n.d. Map – Future Flood Maps. [Online] Available at: https://map.sepa.org.uk/floodmaps/FloodRisk/PostCode. It is noted that SEPA Future Flood Maps were updated in March 2025. The updated future flood maps (Surface Water and Small Watercourses) now include flood risk from small watercourses and has increased the indicative future flood risk areas. It is noted that this information was not available during the early project stages but has been used to inform the assessment.
[65] SEPA Recommended Riparian Corridor. [Online] Available at: https://www.sepa.org.uk/environment/environmental-data/
[66] SEPA Geomorphic Risk Buffer. [Online] Available at: https://www.sepa.org.uk/environment/environmental-data/
[67] SEPA, n.d. Water Classification Hub. [Online] Available at: https://www.sepa.org.uk/data-visualisation/water-classification-hub/ .
[68] Scottish Government, 2019. Map - Scotland's environment web. [Online] Gov.scot. Available at: https://map.environment.gov.scot/sewebmap/.
[69] NatureScot, 2024. Map - SiteLink. [Online] Available at: https://sitelink.nature.scot/map.
[70] Scottish Water, n.d. Asset Plans. [Online] Scottish Water GIS Extranet. Can be requested at: https://www.scottishwater.co.uk/business-and-developers/development-services

Watercourse Crossing and Buffers Assessment, **Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment**, **Appendix 13.3: Peat Depth Survey Report** and **Appendix 13.5: GWDTE Assessment** and are used to inform the baseline assessment. The dates and type of survey are summarised in **Table 13.2: Field Survey Dates and Conditions**.

Table 13.2: Field Survey Dates and Conditions

Survey type	Section of Proposed Development	Date	Weather Conditions
Hydrology walkover	Section A and E (Hurlie and Emmock substations)	22 November 2022	Overcast and dry
Hydrology walkover	Section A	16 October 2023	Sunny and dry
Hydrology walkover	Section B	21 November 2023	Overcast and dry
Hydrology walkover	Section C	28 – 29 November 2023	Sunny and cold
Hydrology walkover	Section F	6 December 2023	Cold and frosty
Hydrology walkover	Section D	7 December 2023	Very wet with heavy rainfall
Groundwater and GWDTE survey	Section F	30 November 2023	Overcast and Mild
Hydrology walkover	Section D	12 December 2023	Wet and cold
Hydrology walkover	Section E and F	13 November 2023	Dry and cold
Hydrology walkover	Section C – Haughhead Farm	8 February 2024	Overcast and dry
Phase 2 peat survey	Section E – Fetteresso Forest	21 February 2024	Overcast and dry
Phase 2 peat survey	Section A and B	18 March 2024	Dry and warm
Phase 2 peat survey	Section A, B, D, E and F	3 – 4 April 2024	Wet with heavy rainfall
Hydrology and peat survey	Section C and F	5 June 2024	Sunny and warm
Hydrology and peat survey	Section E – Durris Forest	16 - 17 July 2024	Overcast with showers
GWDTE survey	Section E – Loch of Park	12 September 2024	Sunny and dry
PWS and hydrology survey	Section F	19 - 22 November 2024	Sunny and cold
PWS and hydrology survey	Section F	27 - 28 November 2024	Sunny and cold
Peat, hydrology and GWDTE survey	Section E – Durris Forest	9 - 11 December 2024	Sunny and cold
Peat, hydrology and GWDTE survey	All Sections A-E	7 – 8 January 2025	Heavy snow showers and cold. Could not continue further north of Durris due to snowfall and weather conditions deteriorating
Peat, hydrology and GWDTE survey	Section E – Fetteresso and Durris Forest	3 – 5 February 2025	Cold and mainly dry

Assessing Significance

13.3.6 The purpose of this Chapter is to identify and assess likely significant effects predicted to result from the construction and operation of the Proposed Development. As detailed in **Section 13.2** above certain impacts were scoped out from assessment as the potential for significant effects was considered unlikely. For scoped in impacts, the likelihood of significant effects was determined through a standard method of assessment outlined in **Volume 1, Chapter 5: EIA Process and Methodology** and based on professional judgement, considering both sensitivity of the receptor and magnitude of change.

Sensitivity

13.3.7 Sensitivity has been determined on the basis of the following criteria shown in **Table 13.3: Criteria to Assess the Sensitivity of Receptor**. These criteria are based on relevant guidance and experience of other similar projects. It is noted that professional judgement drawing upon fieldwork/study data and consultation responses was also used in the final assessment of sensitivity for each receptor.

Table 13.3: Criteria to Assess the Sensitivity of Receptor

Sensitivity of Receptor	Typical Indicators
High	Receptor is of national or international value (ie SSSI, SAC, Special Protection Area (SPA) and Ramsar sites). Receptor is classified by SEPA as High and salmonid spawning grounds present. Abstractions for public (Scottish Water) water supply (groundwater or surface water). The flooding of property (or public roads) that has been susceptible to flooding in the past. Watercourse floodplain/hydrological feature that provides critical flood alleviation benefits. Natural channel and of high morphological diversity. Receptor supports GWDTE confirmed as highly groundwater dependent, and ecological importance of the community assessed to be High in accordance with SEPA (2024) guidance[71]. Class 1 or 2 priority peatland or peat >2.0 m depth.
Medium	Receptor is of regional or local value (eg Local Nature Reserve (LNR)). Receptor is classified by SEPA as Good or Moderate, salmonid species may be present and may be locally important for fisheries. Smaller watercourse lying upstream of larger river that is an SSSI, SAC, SPA or Ramsar. May be subject to improvement plans by SEPA. Abstractions for PWS for domestic supply. Groundwater resource with numerous sensitive users/receptors. Environmental equilibrium copes well with natural fluctuations but cannot absorb some changes greater than this without altering part of its present character. The flooding of property (or public roads) that may be susceptible to flooding. Watercourse/floodplain/hydrological feature that provide some flood alleviation benefits. Semi-natural channel, with morphological diversity. May have some minor morphological constraints. Receptor supports GWDTE confirmed as moderately groundwater dependent, and ecological importance of the community assessed to be Moderate in accordance with SEPA (2024) guidance[71]. Unmodified active peatland. Deeper peat (>1.0 m depth) unless minor area or an area modified to poor condition through previous management.
Low	Receptor is of low environmental importance (eg water quality classified by SEPA as Bad or Poor, fish sporadically present or restricted). Not subject to water quality improvement plans by SEPA. Environmental equilibrium is stable and is resilient to changes which are considerably greater than natural fluctuations, without detriment to its present character. Abstractions for non-potable use. No significant groundwater resource and no identified sensitive users/receptors. No flooding of property or land use of great value. Watercourse/floodplain/hydrological feature that provides minimal flood alleviation benefits. Heavily engineered or artificially modified and may dry up during Summer months.

[71] Ecological importance of a GWDTE receptor is assessed in accordance with SEPA guidance (2024) on factors such as designated sites, conservation status (eg Scottish Biodiversity List), connectivity, extent within Scotland, and supporting notable or particularly sensitive species. Where the ecological importance of a GWDTE is assessed to be lower than the groundwater-dependency status of the receptor, a lower sensitivity may be selected and presented with the corresponding rationale.

Sensitivity of Receptor	Typical Indicators
	No GWDTE confirmed as either moderately or highly groundwater dependent, and ecological importance of the community assessed to be at most Low in accordance with SEPA (2024) guidance[71]. No or shallow peat (0.5 m to <1.0 m depth) and/or modified peat.
Negligible	Receptor is of low environmental importance (eg water quality classified by SEPA as Bad or Poor, fish sporadically present or restricted). Not subject to water quality improvement plans by SEPA. Environmental equilibrium is stable and is resilient to changes which are considerably greater than natural fluctuations, without detriment to its present character. No abstractions for public or PWS. No groundwater resource and no identified sensitive users/receptors. No flooding of property or land use of great value. Watercourse/floodplain/hydrological feature that provides minimal flood alleviation benefits. Heavily engineered or artificially modified and may dry up during Summer months. No GWDTE. No peat present.

Magnitude

13.3.8 The magnitude of change has been assessed based on the criteria presented in **Table 13.4: Criteria for Estimating the Magnitude of Change**. These criteria are based on relevant guidance and experience of other similar studies. These criteria and assessment of magnitude are based on professional judgement, relevant guidance and experience of other similar projects.

Table 13.4: Criteria for Estimating the Magnitude of Change

Magnitude	Description/ Typical Example
High	Fundamental changes to the hydrology, water quality, geology, or hydrogeology (in terms of quantity, quality, and morphology). A >10% change in average flows or >5% change in flood flows. The extent of flood risk areas (as classified by NPF4 – ie land or built form with an annual probability of being flooded of greater than 0.5% including an appropriate allowance for future climate change) will be significantly increased. Change that would render water supply unusable for longer than one month. Change resulting in total loss of feature or integrity of feature or use.
Medium	Material but non-fundamental changes to the hydrology, water quality, geology, or hydrogeology (in terms of quantity, quality, and morphology). A >5% change in average flows and minimal change in flood flows. Extent of flood risk areas will be moderately increased/or decreased. Change that would render water supply unusable for days or weeks with no alternative.
Low	Detectable but non-material changes to the hydrology, water quality, geology, or hydrogeology (in terms of quantity, quality, and morphology). A >1% change in average flows and no increase in flood flows. Change that would render water supply unusable for short period (days) or for longer period if alternative supply put in place.
Negligible	No perceptible changes to the hydrology, water quality, geology, or hydrogeology (in terms of quantity, quality, and morphology). A <1% change in average flows and no change in flood flows. No change in water supply or minor change (days) where alternative is put in place.

Significance of Effect

13.3.9 The significance of effect is determined using the matrix in **Table 13.5: Matrix for Determination of Significance of Effects** below. Major and Moderate effects are considered Significant in the context of the EIA Regulations.

Table 13.5: Matrix for Determination of Significance of Effects

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

Assessment Assumptions and Limitations

Assessment Assumptions

13.3.10 It has been assumed that the depth of excavation for towers will be approximately 4 m deep. The Cable Sealing End Compound (CSEC) includes a tower, so it is assumed to have a similar depth of excavation. It is likely that most access tracks, working platforms, and equipotential zone (EPZ) areas will require excavations of less than 1 m. However, in the absence of detailed ground investigations, this is currently uncertain and the Applicant has noted that are some areas where more than 1 m of cut may be required on access tracks, working platforms and EPZ locations. Given the uncertainty, a precautionary approach has been taken, and all of the proposed infrastructure is assumed to have an excavation depth of > 1 m. This results in a 250 m buffer from all proposed infrastructure (ie the Proposed Development) for the PWS, abstractions and GWDTE assessment of effects (**Volume 5**, **Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment** and **Appendix 13.5: GWDTE Assessment**).

13.3.11 It has been assumed that no upgrades (ie replacement crossings) to the existing watercourse crossings on existing access tracks will be required, unless otherwise stated in the effects assessment and **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**. If this changes, the Applicant will maintain dialogue with SEPA such that the appropriate CAR authorisations for each upgraded crossing can be obtained.

Assessment Limitations

13.3.12 The assessment was based on existing, available data, supplemented by hydrology, peat depth, GWDTE and PWS surveys.

13.3.13 There was no access to some parts of the study area at the time of writing, however in these locations the relevant watercourses could be viewed from the public roads.

13.3.14 The Applicant has carried out a comprehensive survey of PWS, including information collected from Angus, Aberdeenshire, Aberdeen City Councils, SEPA and Scottish Water. This has been supplemented by questionnaire surveys sent to all properties within 1 km of the Proposed Development, which have the potential of having a PWS to establish whether they are on a PWS or mains connection and to obtain further information on the PWS, if applicable. Information gathering on PWS was also undertaken at public consultation events, door-knocking and site visits and ongoing discussions between residents and the Applicant. Despite considerable efforts there remains some uncertainties on the exact location of several assumed PWS supplies along the alignment. For the purpose of the PWS assessment, in these cases the PWS locations have been assumed to be at the properties or nearby well/springs and ongoing discussions and site visits will be undertaken in advance of construction to confirm if these properties do have a PWS and, if so, to ascertain the source location and undertake suitable level of assessment to inform any required mitigation to monitor, protect and/or replace supplies. Any assumed PWS within 250 m of the Proposed Development have been assessed in detail in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment** and the Applicant has committed to monitoring all PWS (known and assumed) within a 250 m buffer of the Proposed Development.

13.3.15 It is considered that there is sufficient information to enable a reasoned decision to be taken in relation to the identification and assessment of likely significant environmental effects on hydrology, hydrogeology, geology and peat.

Limits of Deviation

13.3.16 Within the LOD, it is noted that no micrositing of infrastructure will be undertaken that emplaces infrastructure into watercourse buffers, flood risk areas, GWDTE, PWS and groundwater abstraction buffers. Micrositing of infrastructure that is

already within or close to buffers will aim to move infrastructure further away from sensitive water features, flood risk areas and deeper peat, where possible.

13.4 Baseline Conditions

Climate

13.4.1 The average annual temperature in this area of northeast Scotland is between 5.5°C and 11.1°C (Met Office website[72]). The average annual rainfall varies on location and topography and is of the order of 920 mm (Met Office website).

Watercourses and Surface Water, Water Quality and Protected Areas

13.4.2 The Proposed Development crosses over numerous named and unnamed watercourses along the 105.2 km alignment. There are several small ponds/lochans close to the Proposed Development, none of which are crossed. The Proposed Development is located near the east coast of Scotland from north of Dundee to west of Aberdeen and therefore the majority of watercourses crossed generally flow from northwest/west to southeast/east, draining towards the North Sea. The exception to this is the Dean Water and tributaries, which flows to the west in Section A and enters the River Isla, which is a tributary of the River Tay.

13.4.3 Under the WEWS Act all river basin districts are required to be characterised, a process which requires SEPA to produce an initial assessment of the impact of all significant pressures acting on the water environment. Surface water bodies are defined as being whole or parts of rivers, canals, lochs, estuaries or coastal waters. The main purpose of identifying water bodies is so that their status can be described accurately and compared with environmental objectives.

13.4.4 SEPA has characterised surface water quality status under the terms of the WFD. Classification by SEPA considers water quality, hydromorphology, biological elements including fish, plant life and invertebrates, and specific pollutants known to be problematic. The classification grades watercourses through High, Good, Moderate, Poor and Bad status. This provides a holistic assessment of aquatic ecological health. Within the Site there are numerous watercourses/water bodies large enough to be classified by SEPA and which are shown in **Table 13.6: Watercourses and Waterbodies Classified by SEPA within the Site**, listed from south to north, and **Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk, and Buffers**. The main catchment divides are also shown in **Volume 3, Figure 13.1: Hydrology Overview**.

Table 13.6: Watercourses and Waterbodies Classified by SEPA within the Site

Watercourse/Waterbody	Waterbody ID	SEPA Classification (2023)[73]	Catchment Area of Watercourse at OHL Crossing (km²)[74]	Designation	Main Catchment
Section A					
Fithie Burn	ID 6004	Poor	n/a – OHL is north of Fithie Burn and does not cross it	None	Dighty Water
Kerbet Water	ID 6562	Moderate	62.4	River Tay SAC	Dean Water
Dean Water/Treacle Burn (Forfar to Kerbet Water Confluence)	ID 6556	Moderate	17.7	River Tay SAC	Dean Water
Section B					
River South Esk (White Burn confluence to Estuary)	ID 5799	Good	332.6	River South Esk SAC	River South Esk

[72] Met Office, n.d. Inverbervie - Climate Station (Aberdeenshire) UK climate averages. [Online] Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gfn7kmx6u.
[73] SEPA, 2022. Water Classification Hub. [Online] Available at: https://www.sepa.org.uk/data-visualisation/water-classification-hub/.
[74] Area represents the total catchment area at or close to the OHL crossing location, according to the FEH Web-service or as derived from 50 cm LiDAR data.

Watercourse/Waterbody	Waterbody ID	SEPA Classification (2023)[73]	Catchment Area of Watercourse at OHL Crossing (km²) [74]	Designation	Main Catchment
Noran Water	ID 5805	Moderate	32.9	River South Esk SAC	River South Esk
Section C					
Cruick Water	ID 5712	Good	54.4	None	River North Esk
West Water (Paphrie Burn to North Esk Confluence)	ID 5713	High	139.9	None	River North Esk
River North Esk (Water of Effick to Cruick Water Confluences)	ID 5701	Good	314.5	None	River North Esk
Black Burn	ID 5711	Poor	25.7	None	River North Esk
Dowrie Burn (through Fettercairn) to the confluence with Luther Water	ID 5707	Moderate	28.1	None	River North Esk
Section D					
Devilly Burn	ID 5708	Good	22.9	None	River North Esk
Ducat Water	ID 5709	Good	7.1	None	River North Esk
Luther Water (source to Dowrie Burn Confluence)	ID 5706	Moderate	23.7	None	River North Esk
Bervie Water - upper catchment	ID 23262	Moderate	34.4	None	Bervie Water
Carron Water	ID 23257	Moderate	5.5	None	Carron Water
Section E					
Cowie Water – Fetteresso Water	ID 23254	High	22.6	None	Cowie Water
Sheeoch Burn	ID 23318	Good	27.1	River Dee SAC	River Dee
River Dee – Banchory to Peterculter	ID 23316	Moderate	1782.1	River Dee SAC	River Dee
Section F					
Gormack Burn	ID 23320	Moderate	42.2	None	River Dee
Kinnernie Burn	ID 23323	Good	16.7	None	River Dee

13.4.5 Several of the watercourses within the Site are designated SACs which are of international importance, as noted in the fifth column of **Table 13.6: Watercourses and Waterbodies Classified by SEPA within the Site**. Many of the smaller watercourses and tributaries are within the catchments of the three SACs, and as such the receiving water environment along much of the Site is considered a sensitive receptor. The qualifying features of the three riverine SACs are described below and further information is presented in **Volume 2, Chapter 11: Ecology** and shown in **Volume 3, Figures 11.2.1 to 11.2.5: Designated Sites within 10 km, 5 km and 2 km of the Proposed Development**:

- River Tay SAC: In Section A the Kerbet Water and Dean Water are part of the SAC, which is designated for its clear-water lakes or lochs with aquatic vegetation and Poor to Moderate nutrient levels. Species of importance include Atlantic salmon (*Salmo salar*), otter (*Lutra lutra*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*);

- River South Esk SAC: The Proposed Development in Section B crosses the River South Esk and the Noran Water, both of which are within the SAC, which is designated for Atlantic salmon and freshwater pearl mussel (*Margaritifera margaritifera*); and
- River Dee SAC: The Proposed Development in Section E crosses the Sheeoch Burn and River Dee, both of which are within the SAC. The River Dee is designated for Atlantic salmon, otter and freshwater pearl mussel.

Flood Risk

13.4.6 A review of SEPA Future Flood Maps for rivers indicates that there are several flood risk areas from rivers along the Proposed Development (**Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**). There are large areas of predicted river flood risk associated with the Kerbet Water and the Dean Water west of Forfar in Section A; the Dean Water west of Forfar and the River South Esk in Section B; the Cruick Water and the West Water near the confluence with the River North Esk in Section C; the Luther Water in Section D; the River Dee in Section E; and the Gormack Burn and the Kinnernie Burn in Section F.

13.4.7 There are also smaller areas of flood risk associated with numerous other watercourses, including the Noran Water in Section B; the Black Burn, Weiris Burn and Dowrie Burn in Section C; the Ducat Water, Bervie Water and Carron Water in Section D; and the Burn of Sheeoch in Section E.

13.4.8 SEPA updated their Future Flood maps for rivers and surface water (pluvial) and small watercourses in March 2025. Before this update, the Future Flood maps did not explicitly include flood risk from small watercourses (catchment areas < 3 km^2). The March 2025 update includes small watercourses and has increased the mapped flood risk areas along the alignment and close to the Proposed Development.

13.4.9 The known flood risk areas were avoided as much as practicable during early routeing and alignment phases; this took place before the SEPA map update in March 2025. It is noted that several towers and access tracks that previously avoided flood risk areas are now partially within flood risk areas based on the updated Future Flood maps. An assessment of towers that are within flood risk areas, and appropriate mitigation, are set out in this Chapter. It is noted that all watercourses were buffered by SEPA's riparian buffers in order to avoid flood risk and provide an appropriate riparian buffer.

13.4.10 The Site is not at risk of coastal flooding.

Watercourse Crossings

13.4.11 Existing public roads, forestry and agricultural tracks have been used as much as possible to access the Proposed Development during construction, using existing crossings to minimise the number of new access track crossings proposed. However, given the length of the OHL, 30 new temporary or permanent watercourse crossings for access tracks are required during construction and the Proposed Development will use 57 existing crossings. Details of all new and existing crossings are provided in **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**. None of which are designated watercourses within the riverine SACs.

13.4.12 The OHL itself will over sail multiple watercourses along the alignment. Details of stringing the OHL over watercourses is described in **Volume 1, Chapter 3: Project Description** and no works will take place within the watercourses.

Water Supplies, Discharges, Abstractions and Services

13.4.13 Angus Council, Aberdeen City Council and Aberdeenshire Council were consulted in July 2023 and provided their data bases of PWS within 1 km of the Proposed Development. The Council data indicates several properties known to be supplied by PWS within 1 km of the Site. However, the Councils note that their PWS records need to be verified, as their databases may not contain all PWS and the data on source locations may be patchy and based on historical information. SEPA were consulted in July 2023 and October 2024 and provided data on licensed abstractions within 1 km of the Site.

13.4.14 Further data on PWS and abstractions was obtained through a comprehensive consultation exercise with local residents and farms via PWS questionnaires, public consultation events and property visits and source locations of the PWS/ abstractions were obtained. Full details of the PWS assessment are provided in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment** and the baseline is summarised herein. It is noted that some PWS source locations have had to be assumed using the best available information at the time of writing. These are listed as assumed PWS and ongoing investigations and discussions with landowners are being conducted by the Applicant to establish the location and type of PWS sources at these properties or if they are connected to a mains supply.

13.4.15 SEPA (2024)[43] guidance on assessing the effects of developments on groundwater abstractions (including public and PWS) states that the relevant buffer zones for groundwater abstractions for all proposed infrastructure, both temporary and permanent are:

- 10 m for all activities;
- 100 m radius of all subsurface activities less than 1 m in depth; and
- 250 m of all subsurface activities deeper than 1 m.

13.4.16 During design development all known and assumed PWS and groundwater abstractions were avoided and buffered appropriately, where possible. Given the length of the Proposed Development and the rural setting of the Site, it was not possible to meet the recommended buffers in all cases. **Table 13.7: Details of PWS and abstractions within 250 m of the proposed infrastructure** provides baseline information on PWS and abstractions (including assumed PWS) where the buffers could not be achieved. It also includes surface water abstractions from watercourses downstream of the Proposed Development, which could potentially be affected by surface water runoff (these are noted as watercourses in the second column (source type) of the table).

Table 13.7: Details of PWS and abstractions within 250 m of the proposed infrastructure

PWS Source Name	Source Type	Source Easting	Source Northing	Usage	No of properties supplied and notes
Section A					
Balkemback Farm	Spring	338550	738750	Agricultural (other than irrigation)	One - Balkemback Farm
Coldstream	Two Springs	339396 339461	739901 740231	Livestock and general farm use	One – used by Coldstream for farm use. The property has a Scottish Water mains connection for domestic use
Nether Arniefoul	Spring (Ironharrrow Well)	341009	743799	Domestic	One – Nether Arniefoul
Upper Hayston Farm Cottage	Well	340495	745711	Unknown – possible farm use	The property is on a Scottish Water mains supply. It is assumed that the well may be for farm use.
Section B					
Ballindarg Burn	Watercourse	340700	750200	Agriculture	One - Upper Drumgley Farm
Balmadity	Watercourse	350591	762220	Domestic	Two – Balmadity Cottage, Boggie Cottage
Section C					
Dalladies	Spring	362350	768040	Abstraction for agricultural irrigation and drinking water supply	One - Dalladies Farm
Mains of Drumhendry	Assumed PWS – source type unknown	364489	769292	Unknown	Assumed one – Mains of Drumhendry
Whins Farm	Assumed PWS – source type unknown	366191	770323	Unknown	Assumed one – Whins Farm
Cowieshill	Well	367297	772134	Domestic	One – Cowieshill Farmhouse
Hairyholm	Assumed PWS – source type unknown	366914	772041	Unknown	Assumed one – Hairyholm

PWS Source Name	Source Type	Source Easting	Source Northing	Usage	No of properties supplied and notes
Coldstream Farm (Laurencekirk)	Assumed PWS – source type unknown	366660	772205	Unknown	Assumed one – Coldstream Farm
Coldstream Cottage	Assumed PWS – source type unknown	366585	772374	Unknown	Assumed one – Coldstream Cottage
Parkhouse	Assumed PWS- source type unknown	366585	772374	Unknown	Assumed one - Parkhouse
Thornton Estate	Well	368122	772979	Unknown	Unknown whether the well still supplies any properties on the estate, as most other properties either have a Scottish Water Mains connection or an alternative PWS
Section D					
Black Burn	Watercourse	368650	773310	Abstraction for agriculture	One - used by The Bent for farm use. The property has a Scottish Water mains connection for domestic use
Ducat Water	Watercourse	369300	774160	Abstraction for agriculture	One – used by The Bent for farm use. The property has a Scottish Water mains connection for domestic use
Cairnton Properties	Assumed PWS – source type unknown	372271	776971	Unknown	Assumed – four buildings at Cairnton
Cushnie Farm	Spring	375213	77890	Farm use	One – used by Cushnie Farm. The property has a Scottish Water mains connection for domestic use
Burnhead of Monboddo	Spring Watercourse	374568 374562	779182 779237	Domestic, livestock, general farm use	One – Burnhead of Monboddo
Wattieston House	Assumed PWS – source type unknown	375211	779461	Unknown	Assumed one - Wattieston House
Inches Farm and Cottage	Well (Subsurface spring)	375211	779461	Domestic, livestock, general farm use, commercial	At least 12, including Inches Cottage and Farm, Glenbervie Church and Ice Cream Factory
Cotbank	Well or spring	376767	782760	Domestic, livestock, general farm use, commercial	Nine houses, two farms and three steadings, serving up to 24 individuals
Jacksbank	Spring Borehole	376846 376796	782985 783226	Domestic, livestock, general farm use	Four – Jacksbank Farm, Jacksbank House, 1 + 2 Jacksbank Cottages
Blererno	Well	377924	782921	Domestic	Two properties - Blererno Cottages
Fetteresso Substation	Rainfall-fed	378997	785876	Commercial	One Commercial - Substation
Section E					

PWS Source Name	Source Type	Source Easting	Source Northing	Usage	No of properties supplied and notes
Stonehouse Cottage[75]	Watercourse- Cowie Water	377060	787835	Domestic	One - Stonehouse Cottage
Tillybreak	Watercourse- unnamed tributary of the Cowie Water	378290	788376	Unknown	One - Tillybreak
Monearn Lodge	Borehole	377349	791741	Unknown	One – Monearn Lodge
Meikledams	Assumed PWS – source type unknown	377162	794889	Unknown	Assumed one – Meikledams
Wester Durris	Spring	376591	795591	Domestic, potentially general farm use	At least three, including Wester Durris. Wester Durris Cottage, Milton, potentially Wainsgate
Section F					
Woodbank	Well	377360	798504	Unknown	Unknown – Location informed by resident at Woodbank House. The well was visited during the field survey but it did not appear to be in use.
Park Estate	Well Spring	377534 377583	798716 799342	Domestic	Three – Lochwood Cottage, Westhills Cottage, Hill of Park
King's Well	Well	377339	798901	Unknown - currently uncertainty whether the well serves as a supply.	Possibly Westhills Cottage and Woodbank House
Collonach Cottage	Assumed PWS - source type unknown	376942	799972	Unknown	Assumed one – Collonach Cottage
Templefold	Assumed PWS – source type unknown	377111	803246	Unknown	Assumed one – Templefold
East Finnercy	Spring/ Borehole	376753	804112	Domestic	At least one – Little Finnercy but possibly up to six properties
Stepsbrae Steading/ Backhill of Glack	Well	374493	810670	Domestic, livestock	Two – Stepsbrae Steading, Backhill of Glack
Lauchintilly Cottage	Assumed PWS – source type unknown	374502	812537	Unknown	Assumed one – Lauchintilly Cottage
Wardes Farm and Cottage	Assumed PWS – source type unknown	376383	812219	Unknown	Assumed one – Wardes Farm and Cottage
Bogfold	Well	376001	812659	Domestic, livestock	One - Bogfold
Leylodge Schoolhouse	Spring	376474	812599	Domestic, Livestock	One – Leylodge Schoolhouse

[75] The PWS abstraction is ~500 m downstream of the Proposed Development but is included in the assessment as it is a surface water abstraction which draws water from a watercourse that is downstream of the proposed infrastructure.

13.4.17 Early consultation with Scottish Water (**Table 13.1: Summary of Relevant Consultation**) noted that the Proposed Development is partly within two surface DWPA catchments where a Scottish Water abstraction is located. The River Tay supplies Perth Gowans Terrace WTW and the River Dee (Inchgarth) supplies Mannofield WTW. During early design, these DWPAs were avoided and are over 32 km downstream of the Proposed Development in Section A (River Tay) and over 10 km downstream in Section E (River Dee). However, as they lie downstream of the Proposed Development, it is important that water quality and water quantity in the area are protected.

13.4.18 The Proposed Development is over 200 m downstream of the Buttery Burn DWPA (ID351) (in Section C). The downstream limit of the DWPA is the confluence of the Buttery Burn with the Cruick Water at Mill of Balrownie. The DWPA is upstream of the proposed OHL infrastructure. Surface water DWPAs are shown in **Volume 3, Figures 13.3.1 to 13.3.15: Groundwater Abstractions, Water Supplies and GWDTE**. The Proposed Development itself is not within any surface water DWPAs.

13.4.19 The entire Proposed Development is located within a DWPA for Groundwater (as is the whole of Scotland).

13.4.20 Given the length of the Proposed Development, there are many Scottish Water assets (eg supply and wastewater pipes) within and close to the Site. Scottish Water asset plans for the Proposed Development were purchased by the Applicant and have been used during the early design phase to constrain tower positions, such that there will be minimal disruption to Scottish Water assets. Mitigation measures as proposed in **Section 13.5: Mitigation and Monitoring**, will be implemented to avoid impacts to Scottish Water assets in locations where OHL infrastructure works may interface with water assets. The Applicant and Principal Contractors will maintain close consultation with Scottish Water before and during construction to be cognisant of all assets and ensure avoidance and protection of all Scottish Water assets during the construction works. On this basis, a detailed assessment of Scottish Water assets has been scoped out.

Geology and Soils

13.4.21 The geology (solid and superficial) and soil types within the Site are summarised in **Table 13.8: Geology and soils**, based on a review of BGS 1:50K Bedrock geology and Superficial Deposits and Scottish Soils mapping. An overview of the geology and soil classification along the Proposed Development is presented in **Volume 3, Figure 13.4: Bedrock Geology, Figure 13.5: Superficial Geology** and **Figures 13.6.1 – 13.6.7: Soil Classification**.

Table 13.8: Geology and soils

Bedrock geology	Superficial geology	Soil type
Section A		
Dundee Flagstone Formation – Sedimentary	Till, Devensian - Diamicton. Sedimentary	Balrownie Brown earths Balrownie Humus-iron podzols
Section B		
Dundee Flagstone Formation – Sedimentary	Alluvium – Sedimentary Glaciofluvial Deposits – Sedimentary Till, Devensian - Sedimentary	Balrownie - Brown earths Forfar - Humus-iron podzols Alluvial Soils - Mineral alluvial soils with peaty alluvial soils
Section C		
Cromlix Mudstone Formation - Sedimentary	Alluvium – Sedimentary Glaciofluvial Deposits – Sedimentary Till, Devensian - Diamicton. Sedimentary	Balrownie - Brown earths Forfar - Humus-iron podzols Alluvial Soils - Mineral alluvial soils with peaty alluvial soils
Section D		

Bedrock geology	Superficial geology	Soil type
Cromlix Mudstone Formation - Sedimentary Montrose Volcanic Formation -. Igneous Arbuthnott-garvock Group - Sedimentary Dunnottar-crawton Group - Sedimentary Carron Sandstone Formation - Sedimentary Glen Lethnot Grit Formation - Metamorphic	Mill Of Forest Till Formation – Sedimentary Ury Silts Formation – Sedimentary Alluvium – Sedimentary Drumlithie Sand and Gravel Formation – Sedimentary	Laurencekirk - Brown earths with humus-iron podzols Gourdie - Humus-iron podzols Alluvial Soils - Mineral alluvial soils with peaty alluvial soils
Section E		
Glen Lethnot Grit Formation - Metamorphic Water Of Dye Granite (mount Battock Pluton) - Igneous Queen's Hill Formation - Metamorphic Crathes Pluton - Igneous	Banchory Till Formation – Sedimentary Lochton Sand and Gravel Formation – Sedimentary Peat – Sedimentary Hummocky (moundy) Glacial Deposits – Sedimentary River Terrace Deposits - Sedimentary	Strichen - Peaty gleyed podzols Gourdie - Humus-iron podzols Organic Soils - Dystrophic blanket peat Countesswells - Humus-iron podzols Alluvial Soils - Mineral alluvial soils with peaty alluvial soils
Section F		
Crathes Pluton - Igneous	Banchory Till Formation - Sedimentary Lacustrine Deposits – Sedimentary Peat – Sedimentary Glaciofluvial Sheet Deposits - Sedimentary	Alluvial Soils - Mineral alluvial soils with peaty alluvial soils Corby - Humus-iron podzols Organic Soils - Dystrophic basin peat Countesswells - Noncalcareous gleys with peaty gleys

13.4.22 It should be noted there are several other smaller sections of sedimentary and metamorphic formations, particularly across the Highland Boundary Fault Area west of Stonehaven. There are also several small, localised areas with intrusive volcanic dyke/sill suites and some extrusive lavas.

13.4.23 The western edge of the Proposed Development in Section C lies approximately 500 m south (downstream) of the North Esk and West Water Palaeochannels SSSI, which is designated for geological interests and is shown in **Volume 3, Figure 13.1: Hydrology Overview**. The SSSI citation notes that it provides an excellent example of an assemblage of Quaternary (Ice Age) and fluvial (river) landforms formed at the end of the last glaciation. It includes meltwater channels, moraines and a particularly fine example of sandur (glacial outwash plain) sediments which have been dissected to form four main terrace systems. The SSSI also demonstrates three types of palaeochannel (relict river channels) associated with different fluvial processes on a single terrace surface. Each of the terrace systems exhibit well-developed, braided palaeochannel networks.

13.4.24 The BGS 1:50K Superficial Deposits mapping indicates that there are numerous types of underlying superficial subsurface deposits along the extent of the Site (**Table 13.8: Geology and soils**). The main drift deposit along the Site is Devensian Till (Diamicton) which are sedimentary deposits of glacigenic origin. There are also several large areas around major watercourses which are underlain by glaciofluvial deposits – gravel, sand and silt and alluvium – clay silt, sand and gravel. There are smaller sections of Ury Silts formation, Lochton Sand and Gravel Formation, Glaciofluvial Sheet deposits and Peat.

13.4.25 There are numerous different soil types within the Site (**Table 13.8: Geology and soils**). These are predominantly Brown Earth Soils derived from sandstones and Humus Iron Podzols derived from sandstones. There are smaller areas of Alluvial soils around river valleys and peaty podzols located west/northwest of Stonehaven. The soils in lowland areas typically provide productive soils for agriculture, see **Volume 2, Chapter 7: Land Use and Prime Agricultural Land**.

13.4.26 Sources of potential ground contamination identified by SEPA, Angus Council and Aberdeenshire Council associated with former airfields during consultation are all located more than the recommended 1 km buffer from the Proposed Development, with the exception of the site of the former Edzell Airfield (located approximately 100 m west of the Proposed Development) and the site of the former Fordoun Airfield (which is partially oversailed by the Proposed Development). A Phase 1 Geo-environmental Preliminary Risk Assessment desk study has been undertaken to identify potential risks from soil and groundwater contamination that may affect the Proposed Development. Six separate reports have been provided; one for each Section of the Proposed Development (Sections A to F). Each report has concluded that based on the information contained within that report, there is a low risk with respect to contaminated land. The reports are appended in **Volume 5, Appendix 13.7: Contaminated Land Reports** and contaminated land is not considered further in this chapter.

Peat

13.4.27 The NatureScot (2016) Carbon and Peatland map[62] shows the distribution of carbon and peatland classes in Scotland and gives a value to indicate the likely presence of carbon-rich soils, deep peat and priority peatland habitat at a coarse scale. **Volume 3, Figures 13.7.1 to 13.7.7: Carbon and Peatland classification (NatureScot, 2016)** shows the carbon and peatland classes within the Site. It is noted that the majority of the Site is not underlain by peat and is generally classed as Class 0 (Mineral Soils). Review of the NatureScot map indicates the following peat classes are found in small areas within the Site:

- Class 4 – Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils. Predominantly mineral soil with some peat soil. Indicative vegetation is heath with some peatland; and
- Class 5 – Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat. Peat soil, with no peatland vegetation.

13.4.28 All areas of Class 1, 2 and 3 peat were avoided during the early routeing stages of the project. The results of the desk-based assessment indicated that Class 4 and 5 was present within the boundaries of the Site, within Sections A and B (near Douglastown) Sections D and E (near Fetteresso Forest) and Section F (near Kintore). Class 5 areas are often associated with peatlands that have been afforested. In these areas, shallower peats are usually highly degraded as a result of ploughing for tree planting, drainage and uptake of moisture by growing trees.

13.4.29 Peat depth surveys and coring were undertaken where peat was shown to be likely based on a review of the Carbon and Peatland map, BGS superficial geology mapping and aerial imagery at proposed tower locations and along proposed permanent access tracks (in peat areas). Full details of the peat survey are provided in **Volume 5, Appendix 13.3: Peat Depth Survey Report** and used to inform the Outline PMP (**Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP)**). Results of the peat survey and assessment along the Proposed Development are summarised in **Table 13.9: Peat survey summary** and presented in **Volume 3, Figures 13.8.1 to 13.8.26: Probe Depths**.

Table 13.9: Peat survey summary

Section	Carbon and Peatland Class	Peat survey area (tower numbers)	Summary of probe penetration depth	Comment
Section A				
Tealing to Upper Hayston	Mineral Soil	N/A	N/A	No peat identified

Section	Carbon and Peatland Class	Peat survey area (tower numbers)	Summary of probe penetration depth	Comment
Upper Hayston to Nether Drumgley	Class 4 and 5	S167 – S164	0 – 50 cm	Shallow mineral soils found at each tower location. Classified as non-peatland
Section B				
Nether Drumgley to Woodside	Class 4	S163 – S161	0 – 50 cm	Shallow mineral soil found at each tower location. Classified as non-peatland
Woodside to Hoodston	Mineral Soil	N/A	N/A	No peat identified
Section C				
Hoodston to Haughhead	Mineral Soil	N/A	N/A	No peat identified
Section D				
Haughhead to Tannachie	Mineral Soil	N/A	N/A	No peat identified
Tannachie to Hurlie	Class 4	S4 – S2	0 – 50 cm	Shallow mineral soil found at each tower location. Classified as non-peatland
Section E				
Hurlie to Slug Road	Class 4 and 5	S1, N96 – N91, N86	0 – 50 cm	Shallow mineral soil found at each tower location. Classified as non-peatland
Slug Road to Meikledams	Class 4 and 5	N85 – N80 N79 – N77 N76 – N72	0 – 100 cm 0 – 400 cm 0 – 50 cm	Peat depths up to 345 cm found within Durris Forest. A 400 cm depth was recorded north of Tower N78. Some areas of shallower depths, sometimes greater than 50 cm, found elsewhere in the section. Micrositing has been undertaken based on the peat surveys and the working area modified to minimise excavation as much as practicable based on other constraints. Peatland condition was classified as forested/previously forested at all probe locations within Durris Forest.
Meikledams to West Park	Mineral Soil	N/A	N/A	No peat identified
Section F				
West Park to Newhall	Mineral Soil	N/A	N/A	No peat identified

Section	Carbon and Peatland Class	Peat survey area (tower numbers)	Summary of probe penetration depth	Comment
Newhall to West Cullery	Class 5	N45	All depths at Tower N45 are 0 – 50 cm Small number of > 50 cm probes further north at former tower position.	Shallow area of peaty soils associated with Gormack Burn boggy area. Peatland condition was classified as either modified or non-peatland. Micrositing has been undertaken and working area modified to avoid excavation of peat soils. The tower and working area are not in peat soils.
West Cullery to Kinnernie Burn	Mineral Soil	N/A	N/A	No peat identified
Kinnernie Burn to Kintore	Class 5	N14 – N11	0 – 50 cm	Shallow mineral soils found at each tower location. Classified as non-peatland

13.4.30 Whilst peat is absent across much of the Proposed Development, the initial peat survey encountered several areas of deeper peat. The results from the early phases of the surveys were used to feed into the design, such that areas of deeper peat were avoided during early iterations of the design. Over the whole Proposed Development, there are four areas in Durris Forest (Section E) where proposed towers are on or in close proximity to peat soils > 50 cm deep, all of which are classed as having a peatland condition of forested/previously forested. Micrositing during the design stage of Towers N79 and N83 and their associated working areas has enabled peat soils to be avoided by the excavation footprint at these towers. Tower infrastructure at towers N77 and N78 are in peat soils that cannot be entirely avoided by micrositing. Further information of on peat management is provided within **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP)** and summarised in the effects assessment section of this chapter.

Groundwater Quality

13.4.31 SEPA classify groundwater bodies on a range of qualitative and quantitative parameters which contribute to the 'Overall Status' attributed to the groundwater body. There are two 'Overall Status' categories – 'Good' and 'Poor'. Groundwater classifications are updated on a yearly basis, the most recent of which are detailed in **Table 13.10: Groundwater bodies classified by SEPA within the Site** for groundwater bodies underlying the Proposed Development.

Table 13.10: Groundwater bodies classified by SEPA within the Site

Groundwater body	Groundwater body ID	SEPA Classification (2023)[76]	Area (km^2)	Sub Basin District
Section A				
Sidlaw Hills	ID 150601	Good	129.1	Tay
Strathmore	ID 150681	Poor	573.3	Tay
Section B				
Finavon	ID 150615	Good	151.1	Tay
South Esk Valley and Montrose Coastal	ID 150806	Good	98.8	Tay
Isla and Lower Tay Sand and Gravel	ID 150740	Good	253.7	Tay
Section C				
Laurencekirk	ID 150653	Good	308.6	Tay

[76] SEPA, 2022. Water Classification Hub. [Online] Available at: https://www.sepa.org.uk/data-visualisation/water-classification-hub/.

Groundwater body	Groundwater body ID	SEPA Classification (2023)[76]	Area (km²)	Sub Basin District
North Esk Sand and Gravel	ID 150803	Poor	81.2	Tay
Section D				
Drumlithie	ID 150585	Good	107.8	Tay
Stonehaven	ID 150550	Good	72.9	Tay
Section E				
Portlethen	ID 150625	Good	178.3	Tay
Peterculter	ID 150661	Good	371.2	Tay/North East Scotland
Lower Dee Sand and Gravel	ID 150777	Good	32.4	North East Scotland
Section F				
Inverurie	ID 150685	Good	774.9	North East Scotland

Hydrogeology

13.4.32 Reference to the BGS 1:625K hydrogeological mapping indicates that the Site is generally underlain by two main aquifer types. South of Stonehaven, and generally along Section A to Section E from Tealing to Hurlie, the Proposed Development is mostly underlain by moderately productive sedimentary aquifers in which flow is virtually all through fractures and other discontinuities. The underlying sedimentary rocks yield moderate amounts of groundwater, with some sections yielding up to 12 litres per second (l/s) in some localities.

13.4.33 North of Stonehaven and generally along the majority of Sections E and F of the Site from Hurlie to Kintore, the underlying geology is characterised by low productivity aquifers with virtually all flow through fractures and discontinuities. There are small volumes of groundwater in the near surface weathered zone and secondary fractures, with rare springs yielding up to 2 l/s.

13.4.34 Field surveys and review of Ordnance Survey 1:10K and 1:25K mapping indicates a number of wells and groundwater springs within the Site. Further details of groundwater abstractions are provided in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment** and **Appendix 13.5: GWDTE Assessment**.

13.4.35 SEPA groundwater flood maps indicate that there are several areas of the Proposed Development at low risk of groundwater flooding, which are shown in **Table 13.11: Groundwater flood risk**.

Table 13.11: Groundwater flood risk

Area of groundwater flood risk	Underlying aquifer	Risk of groundwater flooding
Section A		
Finavon	Strathmore (ID 1506861)	Low likelihood
Section B		
Finavon	Finavon (ID 150615)	Low likelihood
Brechin	Laurencekirk (ID 150653)	Low likelihood
Section C		
Inch of Arnhall	North Esk Sand and Gravel (ID 150803)	Low likelihood
Section E		

Area of groundwater flood risk	Underlying aquifer	Risk of groundwater flooding
Peterculter	Peterculter (ID 150661)	Low likelihood

13.4.36 It is likely that groundwater levels within the Site are controlled by water levels within the proximal large watercourses (Dean Water, River South Esk, River North Esk, River Dee etc). An assessment of groundwater levels at each tower location will be undertaken as part of the site investigations in advance of construction. Further groundwater monitoring will be carried out at towers when the water strike is high (less than 5 m Below Ground Level (BGL) or the water level is greater than 5 m BGL but has risen significantly within borehole. If locally raised groundwater levels are identified during site investigations for towers, suitable construction measures will be employed or they will be microsited appropriately.

Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

13.4.37 **Volume 2, Chapter 11: Ecology** and **Appendix 11.2: Habitat and Vegetation Survey Report** present the UK Habitat Classification (UKHab) survey results, the National Vegetation Classification (NVC) survey results, and the potential GWDTEs identified. Potential GWDTEs based on ecology surveys are mapped in **Volume 3, Figures 11.4.1 to 11.4.23: National Vegetation Classification Survey Results**. The GWDTE baseline is presented in detail in **Volume 5, Appendix 13.5: GWDTE Assessment** and summarised below.

13.4.38 The SEPA (2024)[42] Guidance for assessing impacts of development on GWDTEs recommends a 10 m buffer from all project activities, 100 m buffer for excavations < 1 m deep and 250 m buffer zone from all excavations > 1 m. A precautionary approach has been taken, such that all of the proposed infrastructure is assumed to have an excavation depth of > 1 m. This results in a 250 m buffer from the Proposed Development for the GWDTE assessment.

13.4.39 GWDTE surveys were undertaken by a hydrologist on several occasions from November 2024 to February 2025 to ground truth the potential GWDTE polygons noted to have high and moderate groundwater potential based on vegetation to establish the level of actual groundwater dependency associated with each. Based on the results of the hydrology and ecology surveys, a number of adjustments were made to tower locations to avoid GWDTEs and potential GWDTE, where practicable. However, there are eight GWDTEs within 250 m of the proposed infrastructure which could not be buffered appropriately; these are summarised in **Table 13.12: Summary of GWDTEs within 250 m from infrastructure** and the locations are shown in **Volume 3, Figures 13.3.1 to 13.3.15: Groundwater Abstractions, Water Supplies and GWDTE**. There are no GWDTE in Sections A, C and E.

13.4.40 The ecological importance of each GWDTE was assessed during ecology surveys and the sensitivity of the GWDTE defined based on a combination of groundwater dependency and ecological importance at each site-specific location. Further details are provided in **Volume 5, Appendix 13.5: GWDTE Assessment**.

Table 13.12: Summary of GWDTEs within 250 m from infrastructure

GWDTE	Phase 1 (UKHab)	Habitat Classification (NVC class)	Potential GW dependency based on ecology survey (NVC class)	Actual GW dependency based on hydrology survey	Ecological Importance
Section B					
GWDTE 1	Wet woodland Wetland	W6, M23, M9	Moderate	Moderate	Moderate
Section D					
GWDTE 2	Wet woodland Wetland Rush Pasture	W11, M23 (M23b)	Moderate	Moderate – Low	Low
GWDTE 3	Wetland, Rush Pasture	M23 (M23b)	Moderate	Moderate	Low
GWDTE 4	Wetland, Rush Pasture	M23 (M23b)	Moderate	Moderate	Low

GWDTE	Phase 1 (UKHab)	Habitat Classification (NVC class)	Potential GW dependency based on ecology survey (NVC class)	Actual GW dependency based on hydrology survey	Ecological Importance
GWDTE 5	Wetland, Rush Pasture	M23/U4 (M23b)	Moderate	Moderate	Low
Section F					
GWDTE 6	Grassland	MG10	Moderate	Moderate	Low
GWDTE 7	Wetland, Rush Pasture	M23 (M23b)	Moderate	Moderate	Low
GWDTE 8	Wetland, Rush Pasture	M23 (M23a)	Moderate	High	Low

13.4.41 It is noted that several of the *potential* GWDTE polygons identified by NVC surveys do have some habitats which have a surface or sub-surface water influence and these should be considered during project design (eg access tracks).

13.4.42 Ecology and hydrology surveys confirmed that the Loch of Park SSSI is a surface water dominated sensitive habitat. Although there was found to be some groundwater contribution in the area, the habitats are mainly supplied by surface water and the Loch of Park SSSI is therefore not a GWDTE. However, given concerns raised by NatureScot regarding potential effects on flow paths to the SSSI, this has been included in the GWDTE assessment. Details of the Loch of Park SSSI, including results of the ecology and hydrology survey are provided in **Annex 13.5.1: Kintore to Tealing 400 kV Overhead Line (OHL) Project: Loch of Park Site Visit: File Note** of **Volume 5, Appendix 13.5: GWDTE Assessment**. The location of the Loch of Park SSSI is shown in **Figure 13.1: Hydrology Overview** and in the appendix.

Future Baseline in the Absence of the Proposed Development

13.4.43 Without the Proposed Development, the main change to the future baseline would be as a result of climate change. The NPF4 notes "*Development proposals will be sited and designed to adapt to current and future risks from climate change*".

Implications of Climate Change for Baseline Conditions

13.4.44 The summary of the relevant climate change projections using the UK Climate Change Projections 2018 (UKCP18) are:

- temperatures are projected to increase, particularly in Summer;
- Winter rainfall is projected to increase and Summer rainfall is most likely to decrease;
- heavy rain days (rainfall greater than 25 mm) are projected to increase, particularly in Winter;
- near surface wind speeds are expected to increase in the second half of the 21st century with Winter months experiencing more significant effects of winds; however, the increase in wind speeds is projected to be modest; and
- an increase in frequency of Winter storms over the UK.

13.4.45 In summary, the projections highlight that in the 2060's Summer and Winter temperatures are likely to be greater than the current baseline, with Winter rainfall increasing and Summer rainfall decreasing. Increased rainfall will result in higher peak flows in the watercourses impacting the Site in future. In addition, there may be more drought periods in future Summer months, with warmer, drier conditions predicted resulting in lower flows during Summer and more sporadic, intense Summer storm events.

13.4.46 Climate change may affect the ability of peatlands to take up and store carbon. Warmer soils increase the rate of organic material decay and this may result in the release of the carbon stored in peatland soils. Changes in hydrologic conditions (eg summer drought periods and more intense rainfall events) will also affect how quickly organic material decays and the types of plants that grow on the peatland surface. Intense rainfall events could also increase the erosion rates of peat. The balance

between these changing conditions will determine the overall effect on peatlands, however many studies to date highlight that feedbacks within peatland ecosystems make them somewhat resilient to climate change (Waddington et al., 2015[77]).

13.4.47 SEPA (2025)[45] published guidance on climate change in Scotland which provides a regional based approach to estimate uplift in future river flows in Scotland. For large river catchments (over 50 km^2), the peak (200-year) design flow should be increased by 53% in the Tay River Basin and 34% in the North East River Basin to account for projected climate change increases to the year 2100. In addition, the peak rainfall intensity allowance for the Tay region of Scotland is 39% and for the North East region is 34% to the year 2100. Thus, this part of Scotland, which includes the Site, is likely to get wetter with higher peak flows in the watercourses in the future.

13.4.48 Site drainage and watercourse crossing designs will consider future estimates of increased precipitation and flows and will follow an adaptive approach, as per relevant guidance documents from SEPA, Angus Council and Aberdeenshire Council. Based on consultation with SEPA (see **Table 13.1: Summary of Relevant Consultation**) new and upgraded permanent watercourse crossings will be designed to accommodate the 0.5% annual exceedance probability flows (with an appropriate allowance for climate change).

Sensitivity of Receptors

13.4.49 The sensitivity of receptors has been assessed in **Table 13.13: Sensitivity of Receptors** using the criteria in **Table 13.3: Criteria to Assess the Sensitivity of Receptor** based on the baseline conditions summarised above and described in detail in the appendices.

Table 13.13: Sensitivity of Receptors

Receptor	Sensitivity	Comment
Section A		
Surface watercourses/ waterbodies - water quality (Fithie Burn, Tealing Burn, Dighty Water, Kerbet Water and Dean Water)	Low (Fithie Burn, Tealing Burn, Dighty Water) High (Kerbet Water and Dean Water)	The southern part of the Proposed Development in Section A drains to the Dighty Water via the Fithie Burn and Tealing Burn and their tributaries. Both the Fithie Burn and Dighty Water were classified by SEPA as Poor in 2023 and are designated as a "*heavily modified water body on account of physical alterations that cannot be addressed without a significant impact on the drainage of agricultural land and from an increased risk of subsidence or flooding*". The northern part of Proposed Development drains to Kerbet Water and Dean Water, which are part of the River Tay SAC. The Kerbet Water and Dean Water watercourses were classified by SEPA as Moderate in 2023. There is also a Scottish Water abstraction for drinking water in the River Tay catchment (DWPA), over 32 km downstream.
Flood risk	High	There are areas of flood risk associated with the Tealing Burn, Fithie Burn and the Dean Water within and downstream of the Site. There are areas of floodplain/ flood storage within the Site.
Geology	Negligible	There are no designated geology sites within Section A. Effects on geology are scoped out of the assessment for Section A.
Groundwater	Medium	The Site is located within a DWPA for Groundwater (as is the whole of Scotland). The two groundwater bodies underlying the Site are classified by SEPA as Good and Poor in 2023. The receptor supports four groundwater abstractions to supply PWS.
PWS and abstractions	Medium	There are four PWS/abstractions within 250 m of the Proposed Development.

[77] Waddington J. M. et al. (2015) Hydrological feedbacks in northern peatlands. *Ecohydrology*, Volume 8, Issue1, January 2015, Pages 113-127

Receptor	Sensitivity	Comment
GWDTE	n/a	There are no GWDTE within the study area for Section A. Effects on GWDTE are scoped out of the assessment for Section A.
Peat	n/a	There is no peat or peaty soil within Section A. Effects on peat are scoped out of the assessment for Section A.
Section B		
Surface watercourses/ waterbodies - water quality (River South Esk, Noran Water and tributaries)	High	The Proposed Development is largely within the River South Esk and Noran Water catchment, which are both designated within the River South Esk SAC. The Noran Water and River South Esk watercourses were classified by SEPA as Moderate and Good, respectively in 2023.
Flood risk	High	The Proposed Development has largely avoided the wider areas of flood risk, but there are areas of floodplain/ flood storage within and downstream of the Site.
Geology	Negligible	There are no designated geology sites within Section B. Effects on geology are scoped out of the assessment for Section B.
Groundwater	Medium	The Site is located within a DWPA for Groundwater (as is the whole of Scotland). The groundwater bodies underlying the Site are classified by SEPA as Good in 2023. There are no groundwater abstractions within 250 m of the Proposed Development.
PWS and abstractions	Medium	There are two PWS (surface water fed) within 250 m of the Proposed Development.
GWDTE	Medium	There is one moderately dependent GWDTE within the study area for Section B. The ecological importance of the community was assessed to be Moderate in accordance with SEPA (2024)[42] guidance.
Peat	n/a	There is no peat or peaty soil within Section B. Effects on peat are scoped out of the assessment for Section B.
Section C		
Surface watercourses/ waterbodies - water quality (Cruick Water, West Water, River North Esk, Black Burn, Dowrie Burn)	Water quality – High to Low depending on local catchments Buttery Burn – High, as in a DWPA	The main watercourses within Section C were classified by SEPA as Poor (Black Burn) Moderate (Dowrie Burn) Good (Cruick Water and River North Esk) and High (West Water). The Buttery Burn surface DWPA is upstream of most of the Proposed Development, although there are two access tracks within the DWPA.
Flood risk	High	There is a large flood risk area associated with the River North Esk/West Water confluence which the Proposed Development cannot avoid. There are areas of floodplain/ flood storage within and downstream of the Site.
Geology	Medium	The North Esk and West Water Palaeochannels GCR and SSSI is over 500 m from the Proposed Development. The Proposed Development extends over an area of palaeochannels that are not part of the SSSI, but a contiguous part of the same landform.
Groundwater	Medium	The Site is located within a DWPA for Groundwater (as is the whole of Scotland). The two groundwater bodies underlying the Site are classified by SEPA as Good and Poor in 2023. The receptor supports groundwater abstractions to supply PWS.
PWS and abstractions	Medium	There are three known and six assumed PWS/abstractions and a well within 250 m of the Proposed Development.

Receptor	Sensitivity	Comment
GWDTE	n/a	There are no GWDTE within the study area for Section C. Effects on GWDTE are scoped out of the assessment for Section C.
Peat	n/a	There is no peat or peaty soil within Section C. Effects on peat are scoped out of the assessment for Section C.
Section D		
Surface watercourses/ waterbodies - water quality (Devilly Burn, Ducat Water, Luther Water, Bervie Water, Carron Water)	High	The main watercourses within Section D were classified by SEPA as Good (Devilly Burn and Ducat Water) and Moderate (Luther Water, Bervie Water and Carron Water).
Flood risk	High	There is a large flood risk area associated with the Ducat Water and Luther Water which the Proposed Development cannot avoid. There are areas of floodplain/ flood storage within and downstream of the Site.
Geology	Negligible	There are no designated geology sites within Section D. Effects on geology are scoped out of the assessment for Section D.
Groundwater	Medium	The Site is located within a DWPA for Groundwater (as is the whole of Scotland). The groundwater body underlying the Site is classified by SEPA as Good in 2023. The receptor supports groundwater abstractions to supply PWS.
PWS and abstractions	Medium	There are nine known and two assumed PWS/abstractions within 250 m of the Proposed Development.
GWDTE	Low	There are four moderately dependent GWDTE within the study area for Section D. The ecological importance of the four GWDTE communities was assessed to be at most low in accordance with SEPA (2024)[42] guidance.
Peat	n/a	There is no peat or peaty soil within Section D. Effects on peat are scoped out of the assessment for Section D.
Section E		
Surface watercourses/ waterbodies - water quality (Cowie Water, Sheeoch Burn, River Dee)	High	The main watercourses within Section E were classified by SEPA as High (Cowie Water), Good (Sheeoch Burn) and Moderate (River Dee). The Sheeoch Burn, River Dee and tributaries are designated within the River Dee SAC. Effects on the River Dee are assessed within the Section F assessment.
Flood Risk	High	There are flood risk areas associated with the Cowie Water and its tributaries. There are large flood risk areas associated with the River Dee within the Site. There are areas of floodplain/ flood storage within and downstream of the Site. Effects on the River Dee catchment are assessed within the Section F assessment.
Geology	Negligible	There are no designated geology sites within Section E. Effects on geology are scoped out of the assessment for Section E.
Groundwater	Medium	The Site is located within a DWPA for Groundwater (as is the whole of Scotland). The three groundwater bodies underlying the Site are classified by SEPA as Good in 2023. The receptor supports groundwater abstractions to supply PWS.

Receptor	Sensitivity	Comment
PWS and abstractions	Medium	There are four known and one assumed PWS (two are supplied by watercourses) within 500 m of the Proposed Development.
GWDTE	n/a	There are no GWDTE within the study area for Section E. Effects on GWDTE are scoped out of the assessment for Section E.
Peat	Low	There are small areas of peat within Section E, typically located within topographic hollows or saddles. While peat depths reach up to 3.45 m within Durris Forest near Towers N79, N78 and N77, the tower positions and working areas have been sited to avoid the deepest peat. Peatland condition was classified as forested/previously forested at all probe locations within Durris Forest. Effects on peat are scoped into the assessment for Section E.
Section F		
Surface watercourses/ waterbodies - water quality (River Dee (catchment) Gormack Burn, Kinnernie Burn) (River Don (catchment) unnamed tributaries of the Tuach Burn/Tillakae Burn)	High (River Dee (catchment) Gormack Burn, Kinnernie Burn) Medium (River Don (catchment) unnamed tributaries of the Tuach Burn/Tillakae Burn)	The main watercourses within Section F were classified by SEPA as Moderate (Gormack Burn) and Good (Kinnernie Burn). While these burns are not designated as part of the River Dee SAC, they both are within the River Dee SAC catchment. The Sheeoch Burn, River Dee and tributaries (within Section E) are designated within the River Dee SAC. As most of Section F is within the River Dee catchment (see **Volume 3, Figure 13.1: Hydrology Overview**) the effects on the River Dee are assessed in Section F. There is also a Scottish Water abstraction for drinking water in the River Dee catchment (DWPA), over 10 km downstream of the Proposed Development. A small part of the northern section of Section F drains towards the River Don, via the Tuach/Tillakae Burn, which was classified by SEPA as Moderate.
Flood Risk	High	There are large flood risk areas associated with the River Dee and Gormack Burn within the Site. There are areas of floodplain/ flood storage within and downstream of the Site in both the River Dee and Don catchments.
Geology	Negligible	There are no designated geology sites within Section F. Effects on geology are scoped out of the assessment for Section F.
Groundwater	Medium	The Site is located within a DWPA for Groundwater (as is the whole of Scotland). The groundwater body underlying the Site is classified by SEPA as Good in 2023. The receptor supports groundwater abstractions to supply PWS.
PWS and abstractions	Medium	There are seven known and seven assumed PWS within 250 m of the Proposed Development.
GWDTE	Low	There are three moderately or highly dependent GWDTE within 250 m of the Proposed Development. The ecological importance of the three GWDTE communities was assessed to be at most low in accordance with SEPA (2024)[42] guidance.
Peat	Low	There is a small area of shallow peaty soils associated with Gormack Burn boggy area (Quartains Moss). Peatland condition was classified as either modified or non-peatland. Probe depths were all less than 50 cm at the proposed tower location (Tower N45), as it has been microsited during design to avoid peat. There is some shallow peat further

Receptor	Sensitivity	Comment
		north of the proposed tower. Effects on peat are scoped out of the assessment for Section F.

13.5 Mitigation and Monitoring

Embedded Mitigation

13.5.1 Topic specific embedded mitigation (mitigation achieved through design) is outlined below and included in **Volume 2, Chapter 17: Schedule of Mitigation**.

- HG1 - The layout of the Proposed Development has been carefully considered to avoid any development in the 200-year + climate change floodplain of all watercourses, where practicable. SEPA Future Flood maps were used to constrain the design where practicable. The locations where flood risk areas could not be fully avoided are described and assessed in the effects assessment (**Section 13.6**) and shown in **Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk, and Buffers**;
- HG2 – Where flood risk areas cannot be avoided, there will be no land raising within the flood risk areas. In addition, an assessment of predicted flood depths and likelihood of flooding, based on analysis of SEPA flood maps shapefiles, was undertaken during the alignment design phase to determine the most suitable tower positioning within the flood risk areas (ie towers were located in areas with shallower flood depths and lower likelihoods of flooding, where practicable). **Volume 1, Chapter 4: Alternatives and the Routeing Process** outlines the routeing process undertaken and constraints identified. Towers within fluvial flood risk areas (river and small watercourses) will be designed to remain safe and operational during floods and be flood resistant;
- HG3 - Watercourses and waterbodies have where practicable been buffered by either a minimum of 10 m or SEPA's Recommended Riparian Buffer distance (if greater). Locations where the riparian buffers could not be met are assessed in **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment** and summarised in the assessment within this Chapter. The recommended buffer width is scaled to watercourse width (see below, from SEPA, 2024[47]):

Channel width	Recommended buffer (each side of channel)
<2 m	10 m
2-15 m	15 m
>15 m	30 m;

- HG4 – New watercourse crossings will be avoided by using existing access tracks, where practicable. New watercourse crossings will be designed to accommodate the 0.5% annual exceedance probability flows (with an appropriate allowance for climate change) where practicable[78]. Temporary crossings will be designed to pass the 1 in 30 year flow where practicable, or to maintain and not reduce the existing capacity of the channel. Crossing design will follow SEPA guidance on watercourse crossing design (SEPA 2010[35]). SEPA prefer single-span bridges or bottom-less arched culverts for crossings. Single span bridge crossings will be used for all new watercourse crossings on natural watercourses within the SAC catchments;
- HG5 - Areas of peat have been buffered and avoided, where practicable. All Class 1 and 2 peatlands (based on NatureScot 2016 Carbon and Peatland Mapping[62]) has been avoided. The locations where peat could not be fully avoided are described and assessed in the effects assessment (**Section 13.6**);
- HG6 - All excavations less than 1 m deep will be located 100 m away from groundwater abstractions, PWS sources or GWDTE as per SEPA guidance (SEPA 2024)[42, 43], where practicable. Excavations greater than 1 m depth will, where practicable, be located at least 250 m away from groundwater abstraction or PWS sources. Locations where these buffers cannot be met are assessed in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment** and **Appendix 13.5: GWDTE Assessment** and summarised in the assessment within this Chapter;
- HG7 - If locally raised groundwater levels are identified during site investigations for towers, suitable engineering construction measures will be employed or the towers will be microsited appropriately. The construction measures to be

[78] At locations where new or upgraded crossings are not able to be designed to accommodate the 0.5% annual exceedance probability flows plus climate change, justification has been provided in **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment.**

applied will be determined by the Principal Contractor following the site investigation and as part of the Designers Risk Assessment for the tower locations. As an example, an alternative foundation design comprising a piled solution to minimise the interface with ground water could be undertaken; and

- HG8 - The Applicant and Principal Contractors will maintain close consultation with Scottish Water before and during construction to be cognisant of all assets and ensure avoidance and protection of all Scottish Water assets during the construction works.

13.5.2 As a result of engineering constraints and other environmental constraints, there are several site-specific exceptions where the recommended buffers above (ie embedded mitigation) were not able to be achieved. These exceptions are discussed in detail in **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment, Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment, Appendix 13.4: Outline Peat Management Plan (PMP)** and **Appendix 13.5: GWDTE Assessment** and summarised in the effects assessment along with additional site-specific mitigation measures (if required). Additional mitigation is summarised in **Table 13.22: Committed Additional Mitigation Construction**, which follows the effect assessment.

Applied Mitigation

13.5.3 In addition to the embedded mitigation, inherent in the design of the Proposed Development, the Applicant is committed to implementation of applied mitigation measures (**Table 13.14: Applied Mitigation**) which are an integral part of the project development and reflect best practice guidance and recognised industry standards, as well as the Applicant's experience of constructing OHLs. They will comprise a Construction Environmental Management Plan (CEMP) which will comprise, among other requirements, a suite of SSEN Transmission General Environmental Management Plans (GEMPs) and contractor authored documentation, which details general and site-specific measures which will be implemented to avoid or mitigate likely significant effects and which will be effected through planning conditions, construction contract wording or both. The CEMP will include a detailed Pollution Prevention Plan (PPP) to ensure that any discharges of water runoff from the Site to the water environment do not cause pollution.

13.5.4 These plans and documentation will incorporate best practice guidance and recognised industry standards (eg SEPA guidance, including their Guidance for Pollution Prevention (GPPs)[29], CIRIA SUDS Manual[52], CIRIA control of water pollution guidance[53] and CIRIA control of water pollution from linear construction projects guidance[54, 55]). Forestry felling and removal will follow the good practice guidance and legal requirements set out in Section 9 (Forests and Water) of the UK Forestry Standard (2023)[51]. The implementation and audit of the measures in the CEMP and GEMPs will be overseen by an Environmental Clerk of Works (ECoW).

13.5.5 The Principal Contractors will follow SEPA's general binding rules (GBR) under the CAR Regulations[5]. CAR authorisations will be required in relation to a number of activities eg nine watercourse crossings for access tracks will likely require registration or a simple licence under CAR and a construction run-off site licence will be required to cover the discharge of water run-off from the Proposed Development during construction. The relevant CAR licences will be obtained from SEPA by the Principal Contractors in advance of the construction work.

13.5.6 The detailed Construction Environment Management Plan (CEMP) will be developed and approved by Angus Council, Aberdeenshire Council in consultation with SEPA as a pre-commencement condition. An outline CEMP is provided in **Volume 5, Appendix 3.4: Outline CEMP**. The Principal Contractors will be required to prepare a Site Water Management Plan, a Pollution Prevention Plan (PPP) and a detailed Peat Management Plan (PMP), which will be included within the CEMP. These plans will contain a suite of water and peat management and pollution prevention measures and will include the specific Applied Mitigation measures which will be implemented, as detailed in **Table 13.14: Applied Mitigation**.

Table 13.14: Applied Mitigation

Mitigation Measure	Project Stage/Timing	Responsibility
• HG9 – A detailed CEMP will be developed and approved by Angus Council, Aberdeenshire Council in consultation with SEPA as a pre-commencement condition. The CEMP will include a detailed Site Water Management Plan, a PPP, a detailed PMP, an emergency plan (to detail emergency procedures in the event of spillages/pollution event), a monitoring plan and a Construction Flood Response Plan (which will	Pre-Construction and Construction	The Applicant and Principal Contractors

Mitigation Measure	Project Stage/Timing	Responsibility
include all site-specific mitigation measures relating to flood risk, including a plan to monitor and plan the timing of works to avoid construction during periods of heavy rainfall/flooding). • All construction mitigation measures will be included in the CEMP and the CEMP will incorporate good practice guidance from SEPA (including their GPPs), CIRIA (control of water pollution guidance and control of water pollution from linear construction projects) as well as site specific additional mitigation. Development will be undertaken in accordance with the CEMP, unless otherwise agreed upon by the Local Planning Authority.		
• HG10 - The following SSEN Transmission's GEMPs will be adhered to: – TG-NET-ENV-512 (Working in or Near Water); – TG-NET-ENV-515 (Watercourse Crossings); – TG-NET-ENV-519 (Forestry); – TG-NET-ENV-518 (Private Water Supplies); – TG-NET-ENV-523 (Bad Weather); – TG-NET-ENV-511 (Soil Management); – TG-NET-ENV-513 (Working in Sensitive Habitats (Peat)); – TG-NET-ENV-514 (Working with Concrete); and – TG-NET-ENV-520 (Dust Management).	Pre-Construction and Construction	The Applicant and Principal Contractors
• HG11 - Forestry felling and removal will follow the good practice guidance set out in Section 9 (Forests and Water) of the UK Forestry Standard (2023)	Construction	Principal Contractors
• HG12 - Existing watercourse crossings (culverts/bridges) on existing tracks will be used for construction and operation of the Proposed Development, subject to passing structural checks. If the existing crossings are found to be structurally unsound for construction loads, a temporary over-bridging solution will be put in place during construction. Therefore, it is assumed that no upgrades (ie replacement crossings) to existing watercourse crossings will be required, unless otherwise stated in the effects assessment. If this changes, the Applicant will maintain dialogue with SEPA such that the appropriate CAR authorisations can be obtained for upgrades.	Pre-Construction	The Applicant and Principal Contractors
• HG13 – Construction Sustainable Drainage Systems (SuDS) and Pollution Control measures will be used to treat and attenuate surface runoff from new hardstanding and access tracks; reduce sedimentation and erosion and reduce the risk of pollution and accidental spillage. Details of the SuDS and pollution control measures will be included in the approved CEMP and the construction run-off licence (from SEPA).	Construction	Principal Contractors
• HG14 - Construction SuDS and Pollution Control measures to be put in place during construction of new and upgraded access track watercourse crossing. Site-specific details will be included in approved CEMP and via relevant CAR licences.	Construction	Principal Contractors
• HG15 - Appropriately sized culverts passing under new and temporary access tracks that do not restrict flow and allow intercepted field drains and ephemeral streams/surface water flow pathways to pass under the access tracks. Details will be included in approved CEMP.	Construction	Principal Contractors
• HG16 - Interceptor drainage ditches on the upgradient side of all proposed infrastructure to intercept and divert 'clean' surface water runoff draining towards the construction areas. These will be attenuated prior to discharge to the water environment. Details of the SuDS and pollution control measures will be included in the approved CEMP and the construction run-off licence (from SEPA).	Construction	Principal Contractors

Further Survey Requirements and Monitoring

13.5.7 Monitoring of the water quality of the PWS and GWDTE listed in **Table 13.15: Monitoring** will be undertaken before, during and post construction. Details of the assessment and monitoring of PWS and GWDTE are set out **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment** and **Appendix 13.5: GWDTE Assessment**.

13.5.8 Given the proximity of the Proposed Development to the 42 PWS sources identified within 250 m, SSEN Transmission will commit to monitoring all the 42 water supplies before, during and after construction. The monitoring plan will be developed in consultation with SEPA and will follow SEPA (2024)[43] guidance on monitoring. Baseline monitoring at the 42 PWS sources will commence at least 12 months ahead of the development works starting on site and will continue during the construction phase, and for a minimum of 12 months post-construction. A PWS monitoring plan will be provided prior to construction and will be set out in the CEMP.

13.5.9 Monitoring at GWDTEs 1, 5 and 8 will be carried out to assess the quantitative and chemical effects of the infrastructure to ensure that the groundwater flow and quality are not significantly changed, which would put the sensitive receptors at risk. Based on the effects assessment, monitoring of the other GWDTEs is not required (see the effects assessment summary in this Chapter and **Volume 5, Appendix 13.5: GWDTE Assessment**). Monitoring will be carried out before, during and after construction and will follow SEPA (2024)[42] guidance; this will include the installation and sampling of several groundwater monitoring wells. Details of the proposed monitoring plan will be set out in the CEMP.

13.5.10 Post-construction monitoring will be undertaken in proposed peat reuse and restoration areas (in Durris Forest) to ensure vegetation re-establishes, with additional seeding with locally appropriate seed stock if monitoring indicates the need.

13.5.11 An ECoW will be on Site during construction to monitor the effectiveness of Applied and Additional mitigation. Specific monitoring at new and existing watercourse crossings and locations where watercourse buffers could not be achieved will be carried out during construction by the ECoW. The locations are noted in the **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment** and details of the proposed monitoring and response actions will be provided in the CEMP and PPP. If monitoring detects an impact to PWS, GWDTE or watercourses, alternative supplies will be provided for PWS and/or construction will cease until additional sediment/pollution control measures are put in place.

Table 13.15: Monitoring

Monitoring Measure	Project Stage/Timing	Responsibility
• HG17 - Monitoring of all 42 PWS/ abstractions assessed in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment** will commence at least 12 months ahead of the development works starting on site and will continue during the construction phase, and for a minimum of 12 months post-construction. Site specific details of the monitoring proposed is provided in the appendix.	Pre-Construction, Construction and Post Construction	Principal Contractor and ECoW
• HG18 - Pre-construction, construction and post-construction monitoring of GWDTE 1, GWDTE 5 and GWDTE 8.	Pre-Construction, Construction and Post Construction	Principal Contractor and ECoW
• HG19 - Monitoring at the watercourse crossings and locations where watercourse buffers could not be achieved will be carried out during construction – see **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**. This monitoring will mainly be visual checks, supplemented by water quality sampling, if required by the ECoW.	Construction	Principal Contractor and ECoW
• HG20 - Post-construction monitoring will be undertaken in peat reuse and restoration areas (in Durris Forest) to ensure vegetation re-establishes, with additional seeding with locally appropriate seed stock if monitoring indicates the need.	Post Construction	Principal Contractor and ECoW

13.6 Assessment of Likely Significant Effects - Construction

13.6.1 The assessment of effects identified above is based on the project description as outlined in **Volume 1, Chapter 3: Project Description**. Unless otherwise stated, potential effects identified are considered to be adverse.

13.6.2 The following construction effects have been assessed in full, although it is noted that in some sections of the OHL, some receptors have been scoped out as described in **Table 13.13: Sensitivity of Receptors** and in the footnotes below:

- effects on surface and ground water quality (Sections A-F);
- effects on hydrology, run-off rates and flood risk (Sections A-F);
- effects on PWS, public water supplies, groundwater abstractions and GWDTE (Sections A-F)[79];
- effects on peat (Section E only)[80]; and
- effects on geology - the designated geological SSSI (Section C only).

13.6.3 In bringing forward the Proposed Development the Applicant has implemented the mitigation hierarchy (NPF4) through careful project design plus the Embedded and Applied Mitigation described above. Many potential impacts on the water and peat environment are avoided or, where they cannot be avoided, minimised. Across most of the Proposed Development, after application of Embedded and Applied Mitigation, significant effects are therefore unlikely on water quality, run-off rates and flood risk to the downstream water environment. There remains potential for localised significant effects in some areas where watercourse buffers have not been achieved (ie watercourse crossing of access tracks or where temporary access tracks are within buffers) or at local PWS/groundwater/GWDTE abstractions where recommended buffers cannot be achieved. The following assessment focusses on areas of the Proposed Development where recommended buffers have not been able to be achieved. The assessment of effects below is undertaken on the basis that all Embedded and Applied Mitigation is in place.

13.6.4 Activities that will occur during construction that may have an impact on the water environment and peat, include

- site clearance and vegetation (forestry) removal;
- use of heavy plant machinery;
- increase of hardstanding areas;
- formation of temporary working areas around infrastructure to facilitate construction and formation of flat areas from which the conductor will be pulled during construction (known as Equipotential Zones (EPZs));
- excavations for tower foundations and associated activities in tower working areas;
- construction and use of scaffolding to protect road and water crossings during conduction installation;
- construction of new access tracks and upgrading of existing access tracks;
- construction of new watercourse crossings and use of existing crossings;
- associated earthworks, re-profiling and storage of materials;
- realignment and then removal of sections of existing OHL;
- construction of the CSE Compound; and
- construction traffic on access tracks.

13.6.5 The assessment of surface water quality, hydrology and flood risk is based on the main river catchments as receptors (as opposed to using the Proposed Development Section boundaries). The section boundaries do not align exactly with the catchment boundaries (**Volume 3, Figure 13.1: Hydrology Overview**); as such, the approach has been to assess relevant catchments within the section of the alignment that most of its catchment falls into. Effects on PWS, abstractions, GWDTE, peat and geology receptors will be assessed per section, as opposed to catchment.

13.6.6 During the initial design stage, the OHL towers were located to aim to achieve a minimum buffer of at least 50 m from nearby watercourses, based on early guidance from SEPA (June 2023). Following later consultation with Aberdeenshire Council/ SEPA (August 2024) a 10 m minimum buffer from watercourses was recommended, following SEPA's recommended riparian buffers (**Table 13.1: Summary of Relevant Consultation**). Therefore, apart from the exceptions described in Sections A to F below, all infrastructure is at least 10 m away from watercourses and water features.

[79] There are no GWDTE within Sections A, C and E so effects on GWDTE in these sections are scoped out of further assessment.
[80] There is no peat within Sections A, B, C, D and F so effects on peat in these sections are scoped out of further assessment.

13.6.7 The OHL crosses many small (<2 m wide) watercourses and several larger named watercourses along the alignment. Details of stringing the OHL over watercourses is described in **Volume 1, Chapter 3: Project Description** and no works will take place within any of the watercourses during OHL oversailing.

13.6.8 NPF4 defines a flood risk area as one that lies within the 200-year floodplain, including an appropriate allowance for future climate change and Policy 22 notes that most new development proposals will not be supported within flood risk areas. In accordance with the mitigation hierarchy flood risk areas were avoided as much as practicable during early routeing and alignment phases[81].

13.6.9 The Proposed Development is 'essential infrastructure' under NPF4. Policy 22 a) of NPF4 notes that essential infrastructure can be supported in a flood risk area '*where the location is required for operational reasons*' and in such cases Policy 22 a) states that it will be demonstrated by the Applicant that:

- *all risks of flooding are understood and addressed;*
- *there is no reduction in floodplain capacity, increased risk for others, or a need for future flood protection schemes;*
- *the development remains safe and operational during floods;*
- *flood resistant and resilient materials and construction methods are used; and*
- *future adaptations can be made to accommodate the effects of climate.*

13.6.10 Policy 22 c) of NPF4 also notes that *Development proposals will:*

- *i. not increase the risk of surface water flooding to others, or itself be at risk;*
- *ii. manage all rain and surface water through sustainable urban drainage systems (SuDS), which should form part of and integrate with proposed and existing blue-green infrastructure. All proposals should presume no surface water connection to the combined sewer; and*
- *iii. seek to minimise the area of impermeable surface.*

13.6.11 Flood risk is assessed below. The Applicant and Principal Contractors are aware of locations where infrastructure is within flood risk areas and these will be detailed in the CEMP, along with any additional mitigation measures considered to be necessary to minimise the potential for flooding impacts. There will be no land-raising within flood risk areas and towers within fluvial flood risk areas (river and small watercourses) will be designed to remain safe and operational during floods and be flood resistant.

13.6.12 Summary tables of the pre and post-additional mitigation assessment of effects for Sections A to F are presented in the **Table 13.23: Summary of Assessment of Effects** in the Residual Effects section. The prediction of residual effects takes account of all embedded, applied and additional mitigation presented in this chapter together with more detailed measures, good practice and monitoring commitments set out in the various technical plans and assessments in **Volume 5, Appendices 13.1 to 13.6** (**Appendix 13.1: Watercourse Crossing and Buffers Assessment**, **Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment**, **Appendix 13.3: Peat Depth Survey Report**, **Appendix 13.4: Outline Peat Management Plan (PMP)**, **Appendix 13.5: Groundwater Dependent Terrestrial Ecosystems (GWDTE) Assessment** and **Appendix 13.6: Peat Landslide Hazard and Risk Assessment (PLHRA)**).

Section A

Effects during construction on surface and ground water quality

13.6.13 The southern part of Section A drains to the Dighty Water catchment and the northern part to the Dean Water catchment (**Volume 3, Figure 13.1: Hydrology Overview**). There are two locations within Dighty Burn catchment and three locations within the Dean Water catchment where SEPA's riparian buffers from watercourses could not be achieved. These buffer encroachments are described in detail and assessed in **Annex 13.1.2: Details of Buffer Encroachments** of **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment** and shown in **Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk, and Buffers**. Four of the buffer encroachments are associated with existing access tracks that will be used for construction (IDs – D, G, I and J) and one is for a new temporary access track (ID – H).

[81] The routeing, alignment and early design took place before the SEPA update to the Future Flood maps in March 2025. Flood risk areas were avoided as best as practicable.

13.6.14 In Section A, the OHL crosses two watercourses that are designated within the River Tay SAC: the Dean Water is crossed between Towers S164 and S165 and its tributary, the Kerbet Water is crossed between Towers S167 and S168. All four towers, and their associated construction working areas, are set back from the designated watercourses by a minimum of 15 m (the recommended riparian buffer for these watercourses) and there will be no works within the SAC designated watercourses. There is no felling required to facilitate the oversailing of the SAC watercourses.

13.6.15 There are three new crossings of watercourses/drains for access tracks required for the construction of the OHL in the Dighty Water catchment (IDs 7, 12 and 13) and five in the Dean Water catchment (IDs14, 15, 16, 19 and 20, see **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**). Two of the new crossings (ID12 and ID14) will require authorisation under the CAR Regulations. The remainder of the new crossings are on minor watercourses and will be covered by SEPA's GBRs and will not require specific CAR authorisation.

13.6.16 There are eight watercourses that are crossed by existing access tracks to be used during construction (IDs 2, 3, 8, 9, 10, 11, 17, 18) and there are existing culverts or bridges at the watercourse crossings; details of which are provided in **Annex 13.1.1: Details of Watercourse Crossings** of **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**.

13.6.17 In Section A, there is no proposed infrastructure within flood risk areas in the Dighty Water catchment. However, there are six towers (S161, S162, S163, S164, S165 and S167) and the working area of Tower S168 within the fluvial flood risk area of the Dean Water and two towers (S160, S191) within the surface water and small watercourses flood risk areas in the Dean Water catchment (**Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**). Given the width of the flood risk area associated with the Dean Water it was not possible to fully avoid it, however towers were set back from watercourses as far as practicable.

13.6.18 The Embedded and Applied Mitigation described in the sections above will avoid and minimise any adverse effects on the water environment and are considered sufficient that there are no likely significant effects to the water environment at most locations. However, there are exceptions where the relevant buffers cannot be met resulting in localised effects at these locations. These are assessed in detail in **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**. The main potential impacts will be from dust, sediment and hydrocarbons from construction plant and machinery entering the watercourses and groundwater during the construction phase. With Applied Mitigation, including GEMPs which detail specific mitigation measures for dust control, working near water, watercourse crossings, forestry felling and working in bad weather, these effects will be reduced.

13.6.19 The potential impacts on groundwater quality during construction are the risk of hydrocarbon pollution of groundwater resulting from accidental oil or fuel leaks from construction traffic and construction works. There are also potential pollution effects caused by silt and sediment disturbed during construction infiltrating into the groundwater and concrete spillages.

13.6.20 SEPA Future flood maps indicate flood risk areas at nine towers/working areas (as noted above). There is an increased risk of construction related sediment/pollution entering the water environment during flood events.

13.6.21 It is noted that there are no in channel works within any watercourse which is part of the designated River Tay SAC. However, the Kerbet Water and the Dean Water (which are designated within the SAC) will be spanned by the OHL. Appropriate bankside construction techniques will be followed and Applied Mitigation measures will be implemented during construction to avoid and minimise silt and pollutants entering into the water environment.

13.6.22 With Embedded and Applied Mitigation measures in place, the magnitude of the impact of increased sediment/silt runoff causing a deterioration in surface water quality in watercourses within and downstream of the Proposed Development during construction will be temporary and of short duration and the magnitude of impact is considered to be low. The sensitivity of downstream receptors are low (Dighty Water catchment) and high (Dean Water catchment), with respect to water quality. It is noted that the Dighty Water catchment includes the Fithie Burn and Tealing Burn, while the Dean Water catchment includes the Kerbet Water and the River Tay SAC. The significance of the effect is considered to be **Minor** (Not Significant) for receptors in the Dighty Water catchment and **Moderate** (Significant) for receptors in Dean Water catchment. It is noted that predicted adverse effect will be localised but given the high sensitivity of the Dean Water catchment results in a **Moderate** (Significant) effect.

13.6.23 With Embedded and Applied Mitigation measures in place, the likelihood of pollution and accidental spillage occurring is considered low; should they occur the likely severity of impact is also considered low, and the duration of any impacts are

considered likely to be temporary. The magnitude of effect is therefore considered low. The sensitivity of the downstream water environment is low (Dighty Water) and high (Dean Water) hence the significance of the effect on surface water from pollution and accidental spillage risk is considered to be **Minor** (Not Significant) (Dighty Water) and **Moderate (**Significant) (Dean Water). The sensitivity of the groundwater body is medium, hence the significance of effect on groundwater from pollution and accidental spillage risk is **Minor** (Not Significant).

13.6.24 The River Tay DWPA is some 32 km downstream from the Proposed Development. Given the distance to the DWPA and the size of the catchment (and resultant dilution/ dispersion), the magnitude of impact on water quality at the DWPA is considered to be negligible, and hence the significance of effect on the River Tay DWPA is **Negligible** (Not Significant).

Effects during construction on runoff rates and flood risk and groundwater levels/recharge

13.6.25 Flood risk areas could not be fully avoided at the design stage with six towers and the construction working area for one tower within the fluvial flood risk area of the Dean Water and two towers in areas of predicted surface water flood risk. Design mitigation for infrastructure within flood risk areas is set out in the Embedded Mitigation section and construction environmental management measures for towers, working areas and access tracks that are within flood risk areas are set out in the Applied Mitigation section.

13.6.26 Compaction of soils during construction and increased areas of hardstanding and semi-permeable surface reduces the infiltration rate leading to a greater rate and volume of surface water runoff. Clear felling forestry and other vegetation can also lead to an increase in surface water runoff rates, although it is noted there is limited felling required in Section A (approximately 3.5 ha, see **Volume 2, Chapter 8: Forestry**). This can result in a "flashier" catchment response and could potentially increase flood risk downstream. However, the area of hardstanding/semi-permeable surfaces and forestry felling is small compared to the catchment areas, as described below.

13.6.27 The catchment area of two main watercourses downstream of the proposed OHL infrastructure are given in **Table 13.16: Summary of Land-Take and Felling Within Main River Catchments**. The total area of hardstanding or semi-permeable surfaces proposed within each catchment are 0.18 km^2 and 0.37 km^2, which represents 0.14% and 0.17% of the total catchment area of the Dighty Water and Dean Water catchments, respectively. Forestry felling within the Dighty Water and Dean Water catchments is limited (0.017 and 0.022 km^2, respectively), increasing the total to 0.15% and 0.18% of the catchment areas, respectively.

13.6.28 The Embedded and Applied Mitigation described above includes construction SuDS, which will attenuate construction runoff. With Embedded and Applied Mitigation and given the small percentage of land-take (and forestry felling) compared to catchment areas and the commitment to have no land raising during construction within flood risk areas, the magnitude of effect on hydrology, runoff rates and flood risk during construction is considered to be negligible. The sensitivity of the receptors in both catchments is high, resulting in an effect of **Negligible** significance (not significant).

Table 13.16: Summary of Land-Take and Felling Within Main River Catchments

Main Watercourse	Watercourse catchment area downstream of OHL infrastructure (km^2)	Proposed Development within catchment	Total Area of land-take[82] (km^2)	Area of forestry felling within catchment (km^2)	Land-take as a percentage of catchment area	Land-take and Felling as a percentage of catchment area
Dighty Water	129.1	14 towers and associated infrastructure (access tracks, working areas) (Towers S206 to S193)	0.18	0.017	0.14%	0.15%

[82] Land take was estimated using shapefiles of the Proposed Development and includes all towers, construction and tower working areas and assumes a 7 m width for temporary access tracks, 3 m for existing access track widening and 4.5 m for new permanent access tracks as per the Project Description.

Main Watercourse	Watercourse catchment area downstream of OHL infrastructure (km^2)	Proposed Development within catchment	Total Area of land-take[82] (km^2)	Area of forestry felling within catchment (km^2)	Land-take as a percentage of catchment area	Land-take and Felling as a percentage of catchment area
Dean Water at confluence with River Isla	221.4	36 towers and associated infrastructure (access tracks, working area) (Towers S192 to S157)	0.37	0.022	0.17%	0.18%

13.6.29 Changes to the rate and volume of infiltration due to the construction of infrastructure could also affect recharge rates to the groundwater body. Excavations for tower foundations during construction could also result in local changes to groundwater levels, as water would tend to fill up the excavated areas and could temporarily modify local shallow groundwater flow paths.

13.6.30 Excavations for tower foundations require excavation to a depth of 4 m. Excavations could temporarily impact local groundwater levels and local recharge. The effect is considered to be of short duration, highly localised and reversible and is considered to be of low magnitude on the groundwater body as a whole. The sensitivity of the receptor is medium resulting in an effect significance of **Minor** (Not Significant). Effects on specific groundwater receptors are discussed below.

Effects during construction on PWS and Abstractions

13.6.31 A detailed description and assessment of the PWS sources and properties is provided in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and is summarised herein. There are four PWS within 250 m of the Proposed Development in Section A.

13.6.32 Balkemback Farm - The spring serving Balkemback Farm is used for agricultural purposes and is a SEPA licenced abstraction. The occupier did not respond to queries on their PWS but on the basis of available information it is assumed that the farm is also served by a Scottish Water mains supply. The spring is located ~25 m east of the proposed permanent access to Towers S200, S199 and S198. The significance of effect on the PWS before mitigation was assessed to be **Negligible** (Not Significant) and no additional mitigation will be required.

13.6.33 Coldstream - The PWS is used for livestock and general farm use. The property also has a Scottish Water mains connection for domestic use. Coldstream PWS is served by two spring sources. The proposed construction works for Towers S195 and S196 were assessed to have an effect of **Minor** (Not Significant) on one of the springs and a **Moderate** (Significant) effect on the second spring due to proximity of the tower (and working area) to the spring head.

13.6.34 Nether Arniefoul/ Ironharrow Well (assumed PWS) – The PWS is a spring called Ironharrow Well and serves Nether Arniefoul. The property is also likely to have a Scottish Water mains connection. The assumed location of Nether Arniefoul PWS is 227 m upslope of the EPZ around S183 and ~270 m southwest of the nearest proposed track. The effect on the spring source is **Negligible** (Not Significant), but there is a potentially a slight risk of disruption to the pipework between the PWS and the property, if the spring is used as a PWS. A detailed investigation of the distribution network prior to construction will be carried out and cognisant during construction to ensure the pipes are avoided or managed accordingly.

13.6.35 Upper Hayston Farm Cottage – The PWS is a well in garden of the property. The occupier did not respond to queries on their PWS, but on the basis of Scottish Water mapping the property is assumed to have a mains supply and the well is assumed to be for farm use. The well at Upper Hayston Farm Cottage is located approximately 300 m east of Tower S175 and 120 m from the access tracks. The effect on the PWS from the proposed infrastructure was assessed to be of negligible magnitude and of **Negligible** significance (Not Significant).

13.6.36 Additional mitigation and monitoring for PWS is described in detail in the **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and summarised in the additional mitigation and monitoring sections of this Chapter.

Section B

Effects during construction on surface and ground water quality

13.6.37 The majority of Section B is within the River South Esk catchment (**Volume 3, Figure 13.1: Hydrology Overview**). The southern part of Section B drains toward the Dean Water catchment (this is covered in Section A) and the northern part to the River North Esk (this is covered in Section C) for the assessments of effects on surface water quality, hydrology and flood risk.

13.6.38 There are four locations within the River South Esk catchment where SEPA's riparian buffers from watercourses could not be achieved. These buffer encroachments are described in detail and assessed in **Annex 13.1.2: Details of Buffer Encroachments** of **Volume 5, Appendix 13.1: Watercourse Crossings and Buffer Assessment** and are shown in **Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**. Two of the buffer encroachments are for new temporary access tracks (IDs – L and M) and two are associated with existing access tracks that will be used for construction (IDs – N and O).

13.6.39 The River South Esk is spanned by the OHL at a location where the flood risk area is narrow (between Towers S142 and S143) and all towers, and their associated construction working areas, are set back from the watercourse by a minimum of 30 m (the recommended riparian buffer for this watercourse) and are not within any flood risk areas.

13.6.40 It is noted that there is no infrastructure within any watercourses which are part of the designated SAC. However, forest felling and vegetation management is required adjacent to two SAC watercourses (the River South Esk and the Noran Water) and at three smaller watercourses (the King's Burn, an unnamed tributary of the King's Burn and the Bog Burn) which drain to the SAC.

13.6.41 There are two new crossings (IDs 23, 26) of drains for access tracks required for the construction of the OHL (see **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**). These are both small drains (<2 m wide) which are not natural watercourses and the new crossings will not require authorisation under the CAR Regulations.

13.6.42 Within the River South Esk catchment, there are six watercourses that are crossed by existing access tracks to be used during construction and there are existing culverts or bridges at the watercourse crossings (IDs 22, 24, 25, 27, 28, 29); details of which are provided in **Annex 13.1.1: Details of Watercourse Crossings** of **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**.

13.6.43 There is no proposed infrastructure within the future fluvial flood risk areas of the River South Esk catchment, but there is one tower (S145) and the working area of Tower S155 within a surface water flood risk area (**Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**).

13.6.44 The Embedded and Applied Mitigation described in the sections above will avoid and minimise any adverse effects on the water environment and are considered sufficient that there are no likely significant effects to the water environment at most locations. However, there are exceptions where the relevant buffers cannot be met resulting in localised effects at these locations. These are assessed in detail **in Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**. The main potential impacts will be from dust, sediment during construction (and felling) and hydrocarbons from plant and machinery entering the watercourses during the construction phase. With Applied Mitigation, including GEMPs which detail specific mitigation measures for dust control, working near water, watercourse crossings, forestry, working in bad weather and following good practice in the UK Forestry Standard (2023), these effects will be reduced.

13.6.45 The potential impacts on groundwater quality during construction are the risk of hydrocarbon pollution of groundwater resulting from accidental oil or fuel leaks from construction traffic and construction works. There are also potential pollution effects caused by silt and sediment disturbed during construction infiltrating into the groundwater and concrete spillages.

13.6.46 SEPA Future flood maps indicate there are small, localised areas of surface water flood risk at two towers and working areas (as noted above). There are no towers/working areas within the fluvial flood risk areas.

13.6.47 It is noted that there are no in channel works within any watercourse which is part of the designated River South Esk SAC. However, the River South Esk and the Noran Water (which are designated within the SAC) will be spanned by the OHL. Appropriate bankside construction techniques will be followed and Applied Mitigation measures will be implemented during construction to avoid and minimise silt and pollutants entering into the water environment.

13.6.48 With Embedded and Applied Mitigation measures in place, the magnitude of the impact of increased sediment/silt runoff causing a deterioration in surface water quality in watercourses within and downstream of the Proposed Development during

construction will be temporary and of short duration and the magnitude of impact is considered to be low. However, the sensitivity of downstream receptor is high (River South Esk catchment), with respect to water quality, and the significance of the effect is considered **Moderate** (Significant). It is noted that predicted adverse effect will be localised but given the high sensitivity results in a **Moderate** significant effect.

13.6.49 With Embedded and Applied Mitigation measures in place, the likelihood of pollution and accidental spillage occurring is considered low; should they occur the likely severity of impact is also considered low, and the duration of any impacts are considered likely to be temporary. The magnitude of effect is therefore considered low. The sensitivity of the downstream water environment is high (River South Esk) hence the significance of the effect is considered to be **Moderate** (Significant). The sensitivity of the groundwater body is medium, hence the significance of effect on groundwater is Minor (Not Significant).

Effects during construction on runoff rates and flood risk and groundwater levels/recharge

13.6.50 There are no towers or working areas in the fluvial flood risk area. However, Towers S145 and S155 are within a small area of localised surface water flood risk. Design mitigation for infrastructure within flood risk areas is set out in the Embedded Mitigation section and construction environmental management measures for towers, working areas and access tracks that are within flood risk areas are set out in the Applied Mitigation section.

13.6.51 Compaction of soils during construction and increased areas of hardstanding and semi-permeable surface reduces the infiltration rate leading to a greater rate and volume of surface water runoff. Clear felling forestry and other vegetation can also lead to an increase in surface water runoff rates. This can result in a "flashier" catchment response and could potentially increase flood risk downstream. However, the area of hardstanding/semi-permeable surfaces and forestry felling is small compared to the catchment areas, as described below.

13.6.52 The catchment area of the River South Esk downstream of the proposed OHL infrastructure is given in **Table 13.17: Summary of Land-take and Felling Within River South Esk Catchment**. The total area of hardstanding or semi-permeable surfaces proposed within the catchment is 0.28 km^2, which represents 0.05% of the total catchment area. Felling required within the River South Esk catchment is relatively small (0.082 km^2), increasing the total land-take (including felling) to 0.06% of the catchment area.

13.6.53 The Embedded and Applied Mitigation described above includes construction SuDS, which will attenuate all construction runoff. With Embedded and Applied Mitigation and given the small percentage of land-take (and forestry felling) compared to catchment areas and the commitment to have no land raising during construction within flood risk areas, the magnitude of effect on hydrology, runoff rates and flood risk during construction will be negligible. The sensitivity of the receptor is high, resulting in an effect of **Negligible** significance.

Table 13.17: Summary of Land-take and Felling Within River South Esk Catchment

Main Watercourse	Watercourse catchment area downstream of OHL infrastructure (km^2)	Proposed Development within catchment	Total area of land-take[83] (km^2)	Area of forestry felling within catchment (km^2)	Land-take as a percentage of Catchment Area	Land-take and Felling as a percentage of catchment area
River South Esk	563.5	28 towers and associated infrastructure (access tracks, working areas) (S156 - S129)	0.28	0.082	0.05%	0.06%

13.6.54 Excavations for tower foundations require excavation to a depth of 4 m. Excavations could temporarily impact local groundwater levels and local recharge. The effect is considered to be of short duration, highly localised and reversible and is considered to be of low magnitude on the groundwater body as a whole. The sensitivity of the receptor is medium and the significance of the effect is **Minor** (Not Significant). Effects on specific groundwater receptors are discussed below.

[83] Land take was estimated using shapefiles of the Proposed Development and includes all towers, construction and tower working areas and assumes a 7 m width for temporary stone, 3 m for existing access track widening and 4.5 m for new permanent access tracks as per the Project Description.

Effects during construction on PWS and Abstractions

13.6.55 A detailed description and assessment of the PWS sources and properties is provided in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and is summarised herein. There are two PWS/ abstractions within 250 m of the Proposed Development in Section B:

- Ballindarg Burn (Upper Drumgley Farm) – This is a surface water abstraction from the Ballindarg Burn, which is used for agriculture for Upper Drumgley Farm. The farm also has a Scottish Water mains connection for domestic use. The Ballindarg Burn abstraction is licensed for a 560 m length of the burn. The effect on the abstraction is assessed to be **Negligible** (Not Significant); and
- Balmadity PWS – The source is from a watercourse and the PWS serves two properties as a domestic supply. The abstraction is from an unnamed tributary to the Cruick Water which flows to the east. There is a slight potential for the construction works for Towers S126, S125, S124, S123, S122 and S121 to affect the PWS quality via surface water runoff to the watercourse. However, given the distance from the towers and the abstraction point/ watercourse and the Applied Mitigation measures that will be implemented during construction, the effect on the PWS without additional mitigation is considered to of **Negligible to Minor** significance (Not Significant).

13.6.56 Additional mitigation and monitoring for PWS are described in detail in the **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and summarised in the additional mitigation and monitoring sections of this Chapter.

Effects during construction on GWDTE

13.6.57 There is one GWDTE in Section B (GWDTE 1), which was considered to be moderately dependent on groundwater (**Volume 3, Figures 13.3.1 to 13.3.15: Groundwater Abstractions, Water Supplies and GWDTE**). Based on the moderate dependency on groundwater and ecological importance, the sensitivity of the GWDTE receptor is medium. A detailed assessment of the effects of the Proposed Development on the GWDTE is presented in **Volume 5, Appendix 13.5: GWDTE Assessment** and is summarised below.

13.6.58 Tower S153 and its access is within 17 m of the GWDTE polygon and without additional mitigation, the magnitude of impact due to excavation and construction working is assessed to be medium, resulting in an effect of **Moderate** (Significant) significance. Additional mitigation and monitoring are described in the appendix and in the additional mitigation and monitoring sections of this Chapter (see **Table 13.22: Committed Additional Mitigation Construction** below).

Section C

Effects during construction on surface and ground water quality

13.6.59 The Proposed Development within Section C is wholly within the River North Esk catchment. Part of the North Esk catchment also falls within Sections B and D of the Proposed Development (**Volume 3, Figure 13.1: Hydrology Overview**). Effects on surface water quality, hydrology and flood risk on the whole North Esk catchment (including the catchment within Sections B and D) are assessed herein.

13.6.60 There are 11 locations within the River North Esk catchment where the SEPA's riparian buffers from watercourses could not be achieved. These buffer encroachments are described in detail and assessed in **Annex 13.1.2: Details of Buffer Encroachments** of **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment** and are shown in **Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**. Four of the buffer encroachments are associated with existing access tracks that will be used for construction (IDs – Q, R, U and Y), four are for new temporary access tracks (ID – S, T, Z and AA) and three are at indicative temporary working areas for tower construction (IDs V, W and X). It is noted that the tower working area at buffer encroachments V, W and X will be microsited 10 m from the drains during construction and there will be no works in the drains.

13.6.61 There is forestry felling required at several OHL crossings of watercourses within the River North Esk catchment, including the Weiris Burn, Cruick Water, West Water, River North Esk, Black Burn, Black Burn, Luther Water and several small unnamed watercourses and drains.

13.6.62 There are nine new crossings of watercourses/drains for access tracks (IDs - 30, 31, 32, 36, 37, 38, 39, 40 and 43) required for the construction of the OHL (see **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**). Most of these are

small watercourses (<2 m wide). Four of the new crossings (IDs 36, 37, 39 and 40) will require authorisation under the CAR Regulations. The remainder of the new crossings are on minor watercourses and will be covered by SEPA's GBRs.

13.6.63 There are seven watercourses that are crossed by existing access tracks to be used during construction (IDs - 33, 34, 35, 41, 42, 44 and 45) and there are existing culverts or bridges at the watercourse crossings; details of which are provided in **Annex 13.1.1: Details of Watercourse Crossings** of **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**.

13.6.64 There are 37 towers and/or working areas within flood risk areas in the River North Esk catchment, seven of which fall within Section D (S41, S45, S48, S49, SS51, S52, S55). Of the 37 areas at risk of flooding, 10 towers are within fluvial flood risk area of the River North Esk and its tributaries (Cruick Water, Black Burn, Ducat Water). Two towers and the working areas of 18 other towers are within the surface water and small watercourses flood risk areas in the River North Esk catchment (**Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**). Towers were set back from watercourses as far as practicable.

13.6.65 Part of the Proposed Development in Section C is within the Buttery Burn DWPA; this is a short section of temporary access track to Tower S99 and an existing access track to be used during construction to Tower S102; these tracks are both set back from the watercourse by at least 75 m, well over the recommended riparian buffers (**Volume 3, Figure 13.3.6: Groundwater Abstractions, Water Supplies and GWDTE**).

13.6.66 The Embedded and Applied Mitigation described in the sections above will avoid and minimise any adverse effects on the water environment and are considered sufficient that there are no likely significant effects to the water environment at most locations. However, there are exceptions where the relevant buffers cannot be met resulting in localised effects at these locations. These are assessed in detail **in Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**. The main potential impacts will be from dust, sediment during construction (and felling) and hydrocarbons from plant and machinery entering the watercourses during the construction phase. With Applied Mitigation, including GEMPs which detail specific mitigation measures for dust control, working near water, watercourse crossings, forestry, working in bad weather and following good practice in the UK Forestry Standard (2023), these effects will be reduced.

13.6.67 The potential impacts on groundwater quality during construction are the risk of hydrocarbon pollution of groundwater resulting from accidental oil or fuel leaks from construction traffic and construction works. There are also potential pollution effects caused by silt and sediment disturbed during construction infiltrating into the groundwater and concrete spillages.

13.6.68 SEPA Future flood maps indicate flood risk areas at 37 towers and working areas. There is an increased risk of construction related sediment/pollution entering the water environment during flood events.

13.6.69 With Embedded and Applied Mitigation measures in place, the magnitude of the impact of increased sediment/silt runoff causing a deterioration in surface water quality in watercourses within and downstream of the Proposed Development during construction will be temporary and of short duration and the magnitude of impact is considered to be low. The sensitivity of downstream receptors are low (Black Burn catchment), medium (Dowrie Burn, Cruick Water and River North Esk catchments), and high (West Water) with respect to water quality, and the significance of the effect is considered to be **Minor** (Not Significant) for the Black Burn, Dowrie Burn, Cruick Water and River North Esk) and **Moderate** (Significant) for receptors in the West Water. It is noted that predicted adverse effects will be localised but given the high sensitivity of the West Water catchment results in a **Moderate** significant effect.

13.6.70 With Embedded and Applied Mitigation measures in place, the likelihood of pollution and accidental spillage occurring is considered low; should they occur the likely severity of impact is also considered low, and the duration of any impacts are considered likely to be temporary. The magnitude of effect is therefore considered low. The sensitivity of downstream receptors is low (Black Burn catchment), medium (Dowrie Burn, Cruick Water and River North Esk catchments), and high (West Water) with respect to water quality, and the significance of the effect is considered to be **Minor** (Not Significant) (Black Burn, Dowrie Burn, Cruick Water and River North Esk) and **Moderate** (Significant) (West Water). The sensitivity of the groundwater body is medium, hence the significance of effect on groundwater quality is **Minor** (Not Significant).

13.6.71 The sensitivity of the Buttery Burn DWPA is high. The DWPA was avoided as much as possible during the routeing and design and there are no proposed towers or working areas within the DWPA. The short sections of access tracks within the DWPA are over 75 m away from watercourses and there are no watercourse crossings within the DWPA. With Embedded and Applied Mitigation the magnitude of effect on surface water quality in the DWPA is **Negligible**, resulting in an effect of **Negligible** significance (Not Significant).

Effects during construction on runoff rates and flood risk and groundwater levels/recharge

13.6.72 Flood risk areas could not be fully avoided at the design stage. Towers S105, S89, S88, S87, S86, S85, S83, S82, S56 and S48 and the working area of a further seven towers (S112, S84, S77, S55, S49, S45 and S41) are within the fluvial flood risk area of the River North Esk and its tributaries (Cruick Water, Black Burn, Ducat Water). Towers S123 and S67 as well as the working areas of 18 towers (S119, S118, S117, S109, S106, S104, S103, S101, S93, S78, S76, S75, S71, S69, S66, S63, S52 and S51) are within an area of predicted surface water flood risk. Design mitigation for infrastructure within flood risk areas is set out in the Embedded Mitigation section and construction environmental management measures for towers, working areas and access tracks that are within flood risk areas are set out in the Applied Mitigation section.

13.6.73 Compaction of soils during construction and increased areas of hardstanding and semi-permeable surface reduces the infiltration rate leading to a greater rate and volume of surface water runoff. Clear felling forestry and other vegetation can also lead to an increase in surface water runoff rates. This can result in a "flashier" catchment response and could potentially increase flood risk downstream. However, the area of hardstanding/semi-permeable surfaces and forestry felling is small compared to the catchment areas, as described below.

13.6.74 The catchment area of the River North Esk catchment downstream of the proposed OHL infrastructure is given in **Table 13.18: Summary of Land-take and Felling within the River North Esk Catchment**. The total area of hardstanding or semi-permeable surfaces proposed within the River North Esk catchment is 0.88 km^2, which represents 0.1% of the total catchment area. There is 0.26 km^2 of forestry felling required within the River North Esk catchment, increasing the total land-take (including felling) to 0.15% of the catchment area.

13.6.75 The Embedded and Applied Mitigation described above includes construction SuDS, which will attenuate construction runoff. With Embedded and Applied Mitigation and given the small percentage of land-take (and forestry felling) compared to the North Esk catchment area (0.15%) and the commitment to have no land raising within flood risk areas, the magnitude of impact on hydrology, runoff rates and flood risk during construction on the North Esk catchment is considered to be negligible. The sensitivity of the receptor is high resulting in an effect of **Negligible** significance (Not Significant).

Table 13.18: Summary of Land-take and Felling within the River North Esk Catchment

Main Watercourse	Watercourse catchment area downstream of OHL infrastructure (km^2)	Proposed Development within catchment	Total area of land take[84] (km^2)	Area of forestry felling within catchment (km2)	Land-take as a percentage of Catchment Area	Land-take and Felling as a percentage of catchment area
River North Esk	765.6	90 towers and associated infrastructure (access tracks, working areas) (Towers S128 to S39)	0.88	0.26	0.1%	0.15%

13.6.76 Excavations for tower foundations require excavation to a depth of 4 m. Excavations could temporarily impact local groundwater levels and local recharge. The effect is considered to be of short duration, highly localised and reversible and is considered to be of low magnitude on the groundwater body as a whole. The sensitivity of the receptor is medium resulting in an effect of **Minor** significance (Not Significant). Effects on specific groundwater receptors are discussed below.

Effects during construction on PWS and Abstractions

13.6.77 A detailed description and assessment of the PWS sources and properties is provided in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and is summarised herein There are nine PWS within 250 m of the Proposed Development in Section C.

13.6.78 Dalladies - The PWS is a spring for agricultural irrigation and drinking water supply serving Dalladies farm and is a SEPA licensed abstraction. The existing access track leading to Tower S81 (to be upgraded for the Proposed Development) is approximately

[84] Land take was estimated using shapefiles of the Proposed Development and includes all towers, construction and tower working areas and assumes a 7 m width for temporary stone, 3 m for existing access track widening and 4.5 m for new permanent access tracks as per the Project Description.

250 m downgradient of the PWS source and property. Given the distance from infrastructure, the magnitude of impact was considered to be negligible, resulting in an effect of **Negligible** significance (Not Significant).

13.6.79 Mains of Drumhendry (assumed PWS) – There is no confirmation of a mains supply to the Mains of Drumhendry at the time of writing, therefore it is assumed to be supplied by a PWS. The property is located 160 m northwest of the EPZ at Tower S73, 215 m from a proposed new temporary track and 255 m from the tower. The significance of the effect on the assumed PWS was assessed to be **Moderate** (Significant) before additional mitigation.

13.6.80 Whins Farm (assumed PWS) - There is no confirmation of a mains supply to Whins Farm at the time of writing, therefore it is assumed to be supplied by a PWS. The property is located ~25 m from a proposed new temporary track and an existing track running through the farm is to be upgraded. The significance of the effect on the assumed PWS was assessed to be **Moderate** (Significant) before additional mitigation.

13.6.81 Cowieshill – The PWS is a well which supplies the property at Cowieshill Farmhouse for domestic use. The well at Cowieshill is located approximately 105 m southeast of Tower S60 and 145 m northwest from the working area of Tower S61. The significance of the effect on the PWS from the proposed infrastructure was assessed to be of **Minor** significance (Not Significant), as there is potential for the foundation excavations from S61 to temporarily impact the local groundwater table downslope, which could potentially lower groundwater levels at the well.

13.6.82 Hairyholm (assumed PWS) - Hairyholm is likely to be served by a mains connection however this cannot be confirmed at the time of writing, therefore it is assumed to be supplied by a PWS. The property is located ~20 m northeast of a proposed new temporary track which runs past the property. The sensitivity of the assumed PWS is medium and the magnitude of effect is low. Therefore, the effect at the assumed PWS before additional mitigation is considered to be **Minor** (Not Significant).

13.6.83 Coldstream Farm (Laurencekirk) (assumed PWS) - Coldstream Farm is likely to be served by a mains connection however this cannot be confirmed at the time of writing, therefore it is assumed to be supplied by a PWS. The property is located ~80 m northwest of a proposed new temporary track and directly adjacent to an existing track to be upgraded. The significance of effect at the assumed PWS before additional mitigation is considered to be **Minor** (Not Significant).

13.6.84 Coldstream Cottage (assumed PWS) - Coldstream Cottage is likely served by a mains connection however this cannot be confirmed at the time of writing, therefore it is assumed to be supplied by a PWS. The cottage is directly adjacent to an existing track to be used during construction and over 300 m northwest of a proposed new track. The significance of effect at the assumed PWS before additional mitigation is assessed to be of **Negligible** significance (Not Significant).

13.6.85 Parkhouse (assumed PWS) - Parkhouse is likely to be served by a mains connection however this cannot be confirmed at the time of writing, therefore it is assumed to be supplied by a PWS. The property is located 100 m northeast of an existing track leading to Tower S62. The significance of effect at the assumed PWS before additional mitigation is considered to be of **Negligible** significance (Not Significant).

13.6.86 Thornton Estate – The PWS is a well. It is unknown whether the well still supplies any properties on the estate as most properties either have a Scottish Water Mains connection or an alternative PWS. The well is located 185 m northwest (and upslope) of the proposed temporary access track to Tower S56, and the significance of the effect on the well was assessed to be **Negligible** (Not Significant).

13.6.87 Additional mitigation and monitoring for PWS is described in detail in the **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and summarised in the additional mitigation and monitoring sections of this Chapter.

Effects on geology receptors

13.6.88 The Proposed Development is over 500 m south of the North Esk and West Water Palaeochannels SSSI, with Tower S83 being the closest to the SSSI and therefore the natural heritage features of the SSSI will not be permanently affected by the proposal.

13.6.89 All of the Proposed Development is downstream of the SSSI and so there will be no temporary indirect impacts on sedimentation from the development affecting the SSSI.

13.6.90 Following consultation with NatureScot (**Table 13.1: Summary of Relevant Consultation**), the Applicant carried out further work to site the towers away from the extensive suite of palaeochannels that are outside of the SSSI boundary, closer to the Proposed Development. This review was undertaken drawing on LiDAR DTM (Digital Terrain Model) data to identify the

palaeochannels (lower areas) in consultation with NatureScot. The position of Tower S84 was adjusted to fully avoid a palaeochannel. Tower S82 was adjusted as much as practicable but remains close to one of the palaeochannels, although this is ~670 m downstream of the SSSI boundary.

13.6.91 Given the distance of proposed infrastructure from the SSSI and the adjustment of the positions of towers to avoid the suite of palaeochannels outside of the SSSI during the design stage, the magnitude of impact on the North Esk and West Water Palaeochannels SSSI is considered to be negligible. The sensitivity of the receptor is medium, resulting in an effect of **Negligible** significance (Not Significant) on the SSSI. Micrositing of Tower S82 will be carried out to move it further out of the low area (palaeochannel), if practicable.

Section D

Effects during construction on surface and ground water quality

13.6.92 Most of Section D is located within the Bervie Water and Carron Water catchments however the southern part of Section D is within the River North Esk catchment and is therefore assessed as part of Section C (**Volume 3, Figure 13.1: Hydrology Overview**). There are five locations within the Bervie Water catchment and one location in the Carron Water catchment where the SEPA's riparian buffers from watercourses could not be achieved. These buffer encroachments are described in detail and assessed in **Annex 13.1.2: Details of Buffer Encroachments** of **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment** and are shown in **Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**. Four of the buffer encroachments are associated with existing access tracks that will be used for construction (IDs – AC, AD, AF and AG) and two are for new temporary access tracks (IDs –AB and AE).

13.6.93 There is forestry felling required at three OHL crossings of watercourses within the Bervie Water catchment, including the Nursery Burn, Bervie Water and a small unnamed drain and three within the Carron Water catchment, including the Carron Water, Killer Burn and Burn of Elfhill.

13.6.94 There are six new crossings of watercourses/drains for access tracks required for the construction of the OHL (four in the Bervie Water catchment (IDs - 46, 51, 53 and 54) and two in the Carron Water catchment (IDs – 58 and 59); see **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**). Most of these are small watercourses (<2 m wide) and will not require authorisation under the CAR Regulations.

13.6.95 There are 11 watercourses that are crossed by existing access tracks to be used during construction (IDs - 47, 48, 49, 50, 52, 55, 56 in the Bervie catchment and IDs 57, 60, 61, 62 in the Carron Water catchment) and there are existing culverts or bridges at the watercourse crossings; details of which are provided in **Annex 13.1.1: Details of Watercourse Crossings** of **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**.

13.6.96 There is one tower (S23) and one working area (S38) within the fluvial flood risk area of the Bervie Water and its tributary, the Luther Water. The working areas of eight towers (S37, S35, S32, S30, S24, S19, S18 and S16) are within the surface water and small watercourses flood risk areas in the Bervie Water catchment (**Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**). In the Carron Water catchment, there is one working area (S11) in the fluvial flood risk area of the Carron Water and three working areas (S7, S6 and S2) in the surface water and small watercourses flood risk areas of the wider catchment. Towers were set back from watercourses as far as practicable. There is an increased risk of construction related sediment/pollution entering the water environment during flood events.

13.6.97 The Embedded and Applied Mitigation described in the sections above will avoid and minimise any adverse effects on the water environment and are considered sufficient that there are no likely significant effects to the water environment at most locations. However, there are exceptions where the relevant buffers cannot be met resulting in localised effects at these locations. These are assessed **in Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**. The main potential impacts will be from dust, sediment during construction (and felling) and hydrocarbons from plant and machinery entering the watercourses during the construction phase. With Applied Mitigation, including GEMPs which detail specific mitigation measures for dust control, working near water, watercourse crossings, forestry, working in bad weather and following good practice in the UK Forestry Standard (2023), these effects will be reduced.

13.6.98 The potential impacts on groundwater quality during construction are the risk of hydrocarbon pollution of groundwater resulting from accidental oil or fuel leaks from construction traffic and construction works. There are also potential pollution effects caused by silt and sediment disturbed during construction infiltrating into the groundwater and concrete spillages.

13.6.99 With Embedded and Applied Mitigation measures in place, the magnitude of the impact of increased sediment/silt runoff causing a deterioration in surface water quality in watercourses within and downstream of the Proposed Development during construction will be temporary and of short duration and the magnitude of impact is considered to be low. The sensitivity of downstream receptors is high (Devilly Burn, Ducat Water, Luther Water, Bervie Water and Carron Water) with respect to water quality, and the significance of the effect is considered to be **Moderate** (Significant). It is noted that predicted adverse effects will be localised but given the high sensitivity of the receptors results in a **Moderate** significant effect.

13.6.100 With Embedded and Applied Mitigation measures in place, the likelihood of pollution and accidental spillage occurring is considered low; should they occur the likely severity of impact is also considered low, and the duration of any impacts are considered likely to be temporary. The magnitude of effect is therefore considered low. The sensitivity of downstream receptors is high (Devilly Burn, Ducat Water, Luther Water, Bervie Water and Carron Water) and the significance of the effect on surface water from pollution and accidental spillage risk is considered to be **Moderate** (Significant). The sensitivity of the groundwater body is medium, hence the significance of effect on groundwater quality is **Minor** (Not Significant).

Effects during construction on runoff rates and flood risk and groundwater levels/recharge

13.6.101 Flood risk areas could not be fully avoided at the design stage (see **paragraph 13.6.96** above). Design mitigation for infrastructure within flood risk areas is set out in the Embedded Mitigation section and construction environmental management measures for towers, working areas and access tracks that are within flood risk areas are set out in the Applied Mitigation section.

13.6.102 Compaction of soils during construction and increased areas of hardstanding and semi-permeable surface reduces the infiltration rate leading to a greater rate and volume of surface water runoff. Clear felling forestry and other vegetation can also lead to an increase in surface water runoff rates. This can result in a "flashier" catchment response and could potentially increase flood risk downstream. However, the area of hardstanding/semi-permeable surfaces and forestry felling is small compared to the catchment areas, as described below.

13.6.103 The catchment area of the two main river catchments downstream of the proposed OHL infrastructure is given in **Table 13.19: Summary of Land-take and Felling within Main Catchments**. The total area of hardstanding or semi-permeable surfaces proposed within each catchment are 0.23 km^2 and 0.17 km^2, which represents 0.18% and 0.4% of the total catchment area of the Bervie Water and Carron Water catchments, respectively. Forestry felling within the Bervie Water and Carron Water catchments is limited (0.049 and 0.17 km^2, respectively), increasing the total to 0.21% and 0.64% of the catchment areas, respectively.

13.6.104 The Embedded and Applied Mitigation described above includes construction SuDS, which will attenuate all construction runoff. With Embedded and Applied Mitigation and given the small percentage of land-take and felling compared to catchment areas and the commitment to have no land raising during construction within flood risk areas, the magnitude of effect on hydrology, runoff rates and flood risk during construction will be negligible The sensitivity of the receptors in both catchments is high, resulting in an effect of **Negligible** significance (Not Significant).

Table 13.19: Summary of Land-take and Felling within Main Catchments

Main Watercourse	Watercourse catchment area downstream of OHL infrastructure (km^2)	Proposed Development within catchment	Total area of land-take[85] (km^2)	Area of forestry felling within catchment (km^2)	Land-take as a Percentage of Catchment Area	Land-take and Felling as a percentage of catchment area
Bervie Water	132.4	23 towers and associated infrastructure (tracks, working areas) (Towers S38 - S16)	0.23	0.049	0.18%	0.21%

[85] Land take was estimated using shapefiles of the Proposed Development and includes all towers, construction and tower working areas and assumes a 7 m width for temporary stone, 3 m for existing track widening and 4.5 m for new permanent tracks as per the Project Description.

Main Watercourse	Watercourse catchment area downstream of OHL infrastructure (km^2)	Proposed Development within catchment	Total area of land-take[85] (km^2)	Area of forestry felling within catchment (km^2)	Land-take as a Percentage of Catchment Area	Land-take and Felling as a percentage of catchment area
Carron Water	42.7	15 towers and associated infrastructure (tracks, working areas) (Towers S15 – S1)	0.17	0.102	0.40%	0.64%

13.6.105 Excavations for tower foundations require excavation to a depth of 4 m. Excavations could temporarily impact local groundwater levels and local recharge. The effect is considered to be of short duration, highly localised and reversible and is considered to be of low magnitude on the groundwater body as a whole. The sensitivity of the receptor is medium resulting in an effect significance of **Minor** (Not Significant). Effects on specific groundwater receptors are discussed below.

Effects during construction on PWS and Abstractions

13.6.106 A detailed description and assessment of the PWS sources and properties is provided in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and is summarised herein. The PWS/ abstractions within 250 m of the Proposed Development in Section D are described below:

13.6.107 Black Burn – This PWS is a SEPA licensed surface water abstraction from a 1.3 km section of the Black Burn which serves Bent Farm for agricultural use. The farm also has a Scottish Water mains connection. The OHL between proposed Towers S57 and S56 crosses the Black Burn PWS. The magnitude of effect of construction works at Towers S56 and S54, both upgradient of the burn, was assessed to be negligible to low. The sensitivity of the PWS is low, resulting in a effect of **Negligible** to **Minor** significance (Not Significant) on the PWS.

13.6.108 Ducat Water – The PWS is a SEPA licensed surface water abstraction from a 4.6 km section of the Ducat Water, which also serves Bent Farm for agricultural use. The OHL between proposed Towers S50 and S49 crosses the Ducat Water PWS. Towers S50, S49 and S48 all drain directly towards the PWS and the effect on the PWS was assessed be of **Minor** significance (Not Significant).

13.6.109 Cairnton Properties (assumed PWS) – The four properties at Cairnton are likely to be supplied by a mains connection however this cannot be confirmed at the time of writing, therefore it is assumed that a PWS supplies Cairnton Farm and the three other properties. An existing access track proposed for upgrade runs through Cairnton Farm. The effect on the assumed PWS, if present, before additional mitigation is considered to be of **Negligible to Minor** significance (Not Significant).

13.6.110 Cushnie Farm – The PWS is a spring serving Cushnie Farm for agricultural purposes. The farm is also connected to the mains. Cushnie Farm PWS is ~180 m south of the proposed temporary access track leading to Tower S28. Construction of the access track was assessed to have an effect of **Negligible** significance (Not Significant) on the PWS.

13.6.111 Burnhead of Monboddo – The property at Burnhead of Monboddo is served by two sources (a spring and an abstraction from the Hungeral Burn watercourse) adjacent to the property. The spring at Burnhead of Monboddo is located ~205 m downgradient of Tower S28. Groundwater levels at the spring are likely controlled by water level in the Hungeral Burn, but there may be minimal recharge from the surrounding hill slopes. The magnitude of impact of excavation of the tower is considered to be low and the sensitivity of the PWS is medium, resulting in an effect of **Minor** (Not Significant) significance on the spring PWS. The second abstraction from the Hungeral Burn is an agricultural supply (likely for horses at the farm) and has the potential to be affected by runoff from Towers S26 - S28 and access tracks upslope. The effect from the construction of this infrastructure on the surface water PWS was assessed to be of **Minor** (Not Significant) significance, before additional mitigation.

13.6.112 Wattieston House (assumed PWS) – It is likely that this property is served by a PWS but this cannot be confirmed at the time of writing. The PWS is assumed to be at the property. The assumed PWS at Wattieston House is located 220 m northwest of a new temporary track connecting an existing track to Tower S27. The significance of the effect on the assumed PWS, if present, before additional mitigation is considered to be **Minor** (Not Significant).

13.6.113 Inches Cottage and Farm – This PWS is a well (subsurface spring) serving at least 12 properties, including Inches Farm, Inches Cottage, Glenbervie Church and the Ice Cream Factory. Inches Cottage and Farm PWS is a well located 245 m east of the working area around Tower S17 and 312 m from the tower itself. The significance of the effect on the PWS before additional mitigation is considered to **Moderate** (Significant) owing to the potential for groundwater quality and quantity at the well to be affected.

13.6.114 Cotbank – This PWS is a subsurface spring which is one of three sources which supplies the PWS, which serves nine houses, two farms and three steadings in the surrounding area. The spring is located at the top of the hill, ~10 m from the working area around Tower S15 and 62 m from tower itself. Owing to the proximity of the tower and associated access track to the PWS, there is the potential for excavations to affect groundwater supply at the spring and the significance of effect was considered to be **Moderate** (Significant) before additional mitigation.

13.6.115 Jacksbank – This PWS is comprised of a spring and a borehole and serves four properties. The spring at Jacksbank is located on the slope to the south of the properties. Excavations at Tower S14 and construction of the access track leading to S15 have the potential to temporarily impact groundwater levels and water quality at the spring and the significance of effect was assessed to be **Minor** (Not Significant). The borehole at Jacksbank is situated ~190 m downgradient of the proposed Tower S14 working area and the significance of effect was assessed to be **Minor** (Not Significant).

13.6.116 Blererno – This PWS is a well serving two properties at Blererno. The well is approximately 103 m east of an existing access track which will be used to access the Proposed Development. The significance of the effect on the PWS was assessed to be **Negligible** (Not Significant).

13.6.117 Fetteresso Substation – This is a rainfed PWS on the roof of the existing Fetteresso substation, which supplies the substation. The PWS at Fetteresso Substation captures rainwater directly from rainfall (collected on the roof) and will be impacted by construction activities of the Proposed Development. The significance of the effect on the PWS was assessed to be **Negligible** (Not Significant).

13.6.118 Additional mitigation and monitoring for PWS is described in detail in the **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and summarised in the additional mitigation and monitoring sections of this chapter.

Effects during construction on GWDTE

13.6.119 There are four GWDTE in Section D, which were all assessed to have **moderate** dependency on groundwater (**Volume 3, Figures 13.3.1 to 13.3.15: Groundwater Abstractions, Water Supplies and GWDTE**) and were all assessed to be of low ecological importance, hence are considered to be low sensitivity. These were assessed in detail in **Volume 5, Appendix 13.5: GWDTE Assessment** and summarised below.

13.6.120 GWDTE 2 is a moderately/low dependent GWDTE in an area of wet woodland, wetland and rush pasture in a large meander of a tributary to the Ducat Water. It is likely to have surface water input. GWDTE 2 is located upgradient of Towers S46 and S47 and their associated access track. The magnitude of effect of construction on the GWDTE is considered to be low, resulting in an effect of **Minor** (Not Significant) significance during construction.

13.6.121 GWDTE 3 is a moderately dependent GWDTE in an area of wetland/ rush pasture, located in a topographic depression and is fed by a groundwater upwelling (spring) further upslope which also feeds GWDTE 4. The GWDTE (and spring) are located downgradient of Tower S29. Groundwater levels were considered unlikely to be impacted by excavation during construction, as the infrastructure location is over 12 m higher in elevation than the GWDTE and spring. The magnitude of effect on the GWDTE was assessed to be negligible and therefore the significance of effect is **Negligible** (Not Significant).

13.6.122 GWDTE 4 is a moderately dependent GWDTE in an area of wetland/rush pasture, located on the slope of a small hill and is fed by the same groundwater upwelling (spring) as GWDTE 3. The GWDTE is located ~5 m lower in elevation than Tower S29, and ~150 m east of the tower, therefore groundwater levels are unlikely to be impacted by excavation during construction, as the infrastructure is sited several metres higher than the GWDTE and the spring. Surface flow pathways, based on the available topographic data indicate that there are no flow pathways towards the GWDTE from Tower S29. The magnitude of effect and the significance of the effect were assessed to be **Negligible** (Not Significant).

13.6.123 GWDTE 5 is a moderately dependent GWDTE in an area of wetland/rush pasture, located in an area with several groundwater upwellings and PWS on the eastern flank of Droop Hill. Tower S20 working area would be located ~35 m south/southeast of the

GWDTE and downgradient of the GWDTE and the access track would be less than 20 m southeast of the GWDTE. There are uncertainties regarding the groundwater levels at this location and subsequently the potential for groundwater levels to be reduced by construction excavation activities penetrating the groundwater table. The magnitude of effect during construction on the groundwater supply to the GWDTE has been assessed as **Medium**. Given the low sensitivity of the GWDTE, the significance of effect without additional mitigation/monitoring is considered to be **Minor** (Not Significant).

Section E

Effects during construction on surface and ground water quality

13.6.124 Section E is split approximately half way between the Cowie Water catchment and the River Dee (Grampian) catchment. The Cowie Water catchment is assessed in Section E and, as the River Dee covers a larger area in Section F, effects on the River Dee are captured in the assessment for Section F. All infrastructure within the Cowie Water catchment is located outside the SEPA's riparian buffers from watercourses.

13.6.125 There are no new watercourse/drain crossings proposed in the Cowie Water catchment. There are 10 watercourses that are crossed by existing access tracks (IDs 63, 64, 65, 66, 67, 68, 69, 70, 71 and 72) to be used during construction and there are existing culverts or bridges at the watercourse crossings; details of which are provided in **Annex 13.1.1 : Details of Watercourse Crossings** of **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**. There are no other locations within the Cowie Water catchment where SEPA's riparian buffers from watercourses could not be achieved; hence no working within or close to watercourses (with the exception of forestry felling), as all riparian buffers have been achieved.

13.6.126 Much of the Cowie Water catchment is within Fetteresso Forest in the south and Durris Forest in the north, hence the requirement for forestry felling along sections of the OHL alignment. Most of the felling in the catchment is located well away from watercourses, with the exception of the OHL crossings of the Cowie Water and the Black Burn.

13.6.127 There are four tower working areas within flood risk areas in the Cowie Water catchment (Towers N93, N86, N82 and N78). The flood risk is all pluvial (surface water) and is generally distributed as small areas, which are likely to be topographic lows (**Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**).

13.6.128 The Embedded and Applied Mitigation described in the sections above will avoid and minimise any adverse effects on the water environment and are considered sufficient that there are no likely significant effects to the water environment at most locations. However, there are exceptions where the relevant buffers cannot be met resulting in localised effects at these locations (eg existing watercourse crossings). These are assessed in **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**. The main potential effects will be from dust, sediment during construction (and felling) and hydrocarbons from plant and machinery entering the watercourses during the construction phase. With Applied Mitigation, including GEMPs which detail specific mitigation measures for dust control, working near water, watercourse crossings, forestry, working in bad weather and following good practice in the UK Forestry Standard (2023), these effects will be reduced.

13.6.129 The potential impacts on groundwater quality during construction are the risk of hydrocarbon pollution of groundwater resulting from accidental oil or fuel leaks from construction traffic and construction works. There are also potential pollution effects caused by silt and sediment disturbed during construction infiltrating into the groundwater and concrete spillages.

13.6.130 With Embedded and Applied Mitigation measures in place, the magnitude of the impact of increased sediment/silt runoff causing a deterioration in surface water quality in watercourses within and downstream of the Proposed Development during construction will be temporary and of short duration and the magnitude of impact is considered to be negligible. The sensitivity of downstream receptors is high (Cowie Water) with respect to water quality, and the significance of the effect is considered to be **Negligible** (Not Significant).

13.6.131 With Embedded and Applied Mitigation measures in place, the likelihood of pollution and accidental spillage occurring is considered negligible; should they occur the likely severity of impact is considered low, and the duration of any impacts are considered likely to be temporary. The magnitude of effect is therefore considered negligible. The sensitivity of downstream receptors is high (Cowie Water) with respect to water quality, and the significance of the effect is considered to be **Negligible** (Not Significant). The sensitivity of the groundwater body is medium and the magnitude of impact is low, hence the significance of effect on groundwater quality is **Minor** (Not Significant).

Effects during construction on runoff rates and flood risk and groundwater levels/recharge

13.6.132 There are no towers or working areas in the fluvial flood risk area. However, there are four tower working areas in areas of localised surface water flood risk. Design mitigation for infrastructure within flood risk areas is set out in the Embedded Mitigation section and construction environmental management measures for towers, working areas and access tracks that are within flood risk areas are set out in the Applied Mitigation section.

13.6.133 Compaction of soils during construction and increased areas of hardstanding and semi-permeable surface reduces the infiltration rate leading to a greater rate and volume of surface water runoff. Clear felling forestry and other vegetation can also lead to an increase in surface water runoff rates. This can result in a "flashier" catchment response and could potentially increase flood risk downstream. However, the area of hardstanding/semi-permeable surfaces and forestry felling is small compared to the catchment areas, as described below.

13.6.134 The area of the Cowie Water catchment downstream of the proposed OHL infrastructure is given in **Table 13.20: Summary of Land-take and Felling within the Cowie Water Catchment**. The total area of hardstanding or semi-permeable surfaces proposed within the Cowie Water catchment is 0.15 km^2, which represents 0.20% of the total catchment area. Felling required within the Cowie Water catchment is 0.65 km^2, increasing the total land-take (including felling) to 1.09% of the catchment area.

13.6.135 The Embedded and Applied Mitigation described above includes construction SuDS, which will attenuate construction runoff. With Embedded and Applied Mitigation and given the small percentage of land-take (and felling) compared to Cowie Water catchment area and the commitment to have no land raising during construction within flood risk areas, the magnitude of effect on hydrology, runoff rates and flood risk during construction will be negligible. The sensitivity of the receptor is high, resulting in an effect of **Negligible** significance (Not Significant).

Table 13.20: Summary of Land-take and Felling within the Cowie Water Catchment

Main Watercourse	Watercourse catchment area downstream of OHL infrastructure ($km^{2)}$	Proposed Development within catchment	Total area of land-take[86] (km^2)	Area of forestry felling within catchment (km^2)	Land-take as a Percentage of Catchment Area	Land-take and Felling as a percentage of catchment area
Cowie Water	73.3	19 towers and associated infrastructure (access tracks, working areas) (Towers S96 to S78)	0.15	0.65	0.20%	1.09%

13.6.136 Excavations for tower foundations require excavation to a depth of 4 m. Excavations could temporarily impact local groundwater levels and local recharge. The effect is considered to be of short duration, highly localised and reversible and is considered to be of low magnitude on the groundwater body as a whole. The sensitivity of the receptor is medium and the significance of the effect is **Minor** (Not Significant). Effects on specific groundwater receptors are discussed below.

Effects during construction on PWS and Abstractions

13.6.137 A detailed description and assessment of the PWS sources and properties is provided in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and is summarised herein. There are four known and one assumed PWS within 250 m of the Proposed Development in Section E.

13.6.138 Stonehouse Cottage - The PWS is a is a direct watercourse abstraction from the Cowie Water, serving one property. The abstraction is ~500 m downstream on the Cowie Water from the existing access track, which will be used during construction. The magnitude of impact was assessed to be negligible. The PWS is considered to be of medium sensitivity. The significance of the effect on the PWS during construction was assessed to be **Negligible** (Not Significant).

[86] Land take was estimated using shapefiles of the Proposed Development and includes all towers, construction and tower working areas and assumes a 5 m width for temporary access tracks/trackways, 7 m for temporary stone, 3 m for existing access track widening and 4.5 m for new permanent access tracks as per the Project Description.

13.6.139 Tillybreak - The PWS is a is a direct watercourse abstraction from a minor, unnamed tributary of the Cowie Water and serves one known property. The watercourse abstraction at Tillybreak is ~30 m downslope of the existing access track which drains towards the watercourse. The PWS is considered to be of medium sensitivity and the effect during construction is assessed to be **Minor** (Not Significant).

13.6.140 Monearn Lodge – The PWS is a borehole supplying only Monearn Lodge. Monearn Lodge PWS is 147 m southeast of an existing forestry track which will be used for construction. The significance of effect on the PWS was assessed to be **Negligible** (Not Significant).

13.6.141 Meikledams (assumed PWS) – It is likely that this property is served by a PWS but this cannot be confirmed at the time of writing. The PWS is assumed to be at the property. The assumed PWS at Meikledams is ~245 m south of an existing track to be used during construction, close to Tower N67. The significance of the effect on the assumed PWS, if present, is considered to be **Negligible** (Not Significant).

13.6.142 Wester Durris – The PWS is a spring supplying three known properties. The spring is located 190 m west of an existing access track and 243 m southwest of Tower 492R, part of the realignment around Kirkton of Durris. The significance of the effect on the PWS is assessed to be **Negligible to Minor** (Not Significant), depending on the depth of excavation required for any access track upgrades.

13.6.143 Additional mitigation and monitoring for PWS is described in detail in the **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and summarised in the additional mitigation and monitoring sections of this Chapter.

Effects during construction on Peat

13.6.144 Peat depths of >0.5 m were recorded close to four towers (N83, N79, N78 and N77) with a maximum depth of 3.5 m recorded in the vicinity of N78. Micrositing of towers and working areas in these locations during the design stage has minimised overlap with the deepest peat, although further optimisation may be possible in the event of consent. Further information is provided in **Volume 5, Appendix 13.4: Outline Peat Management Plan**.

13.6.145 Due to micrositing during the design stage to avoid and minimise impacts following the NPF4 mitigation hierarchy, peat has been avoided as much as possible throughout the Proposed Development, however is directly impacted at Towers N77 and N78. At N83, impacts will be limited to floating laydowns, rather than excavation. It is proposed to permanently excavate peat within the footprints of each leg foundation and temporarily excavate peat around these legs, backfilling once the foundations are in place. The OPMP (**Volume 5, Appendix 13.4: Outline Peat Management Plan**) details permanent and temporary excavation volumes for these two towers. In total, approximately 592 m^3 of peat will be permanently excavated and approximately 5,515 m^3 temporarily excavated and reinstated, the latter for a combination of providing a safe (temporary) working area and stable crane pad. Access to the crane pad and the working areas will be via floating track and therefore require no excavation. There is sufficient area in non-peat soil adjacent to Towers N77 and N78 to be constructed without the need for ancillary infrastructure (parking, soil storage, component storage) to require further excavation of peat.

13.6.146 All temporarily excavated peat will be reinstated at source once tower construction has concluded. Permanently excavated peat will be reused to support forest-to-bog restoration being undertaken by FLS in areas immediately adjacent to the proposed OHL. These areas have previously been compromised by ground preparation for forestry and decades of tree growth. The areas are of very low gradient, and while outside the Limit of Deviation for the Proposed Development, provide the best reuse opportunity for excavated peat. The OPMP provides the restoration principles that will be adopted on the FLS land adjacent to the OHL. Based on the OPMP, there will be no net loss of peat, with all peat reinstated at source or used in support of peat restoration. A carbon balance assessment has been undertaken and is presented within **Volume 5, Appendix 6.5: Peatland Carbon Emissions Assessment**.

13.6.147 A PLHRA (**Volume 5, Appendix 13.6: Peat Landslide Hazard and Risk Assessment**) has been undertaken in support of the Proposed Development. Both qualitative (landslide susceptibility) and quantitative (Factor of Safety) analyses were undertaken in areas where peat was found to be present. No areas of Moderate peat landslide likelihood were identified and therefore risks cannot exceed **Low**. As a result, standard good practice construction measures are considered to be sufficient to manage these risks, these measures being detailed in the PLHRA.

13.6.148 Impacts on peat are considered to be of **Low** magnitude. The sensitivity of the peat is **Low**, resulting in an effect of **Minor** significance, before additional mitigation.

Section F

Effects during construction on surface and ground water quality

13.6.149 Section F falls largely within the River Dee catchment, except Towers N9 to N1 in the north, which are situated in the River Don catchment. This section will also assess parts of the Proposed Development in Section E which falls within the River Dee catchment.

13.6.150 There are 12 locations within River Dee catchment where SEPA's riparian buffers from watercourses could not be achieved. These buffer encroachments are described in detail and assessed in **Annex 13.1.2: Details of Buffer Encroachments** of **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment** and are shown in **Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**. Eight of the buffer encroachments are associated with existing access tracks that will be used for construction (IDs AH, AJ, AM, AN, AO, AP, AQ and AR), one is for a new permanent track for operation and maintenance (ID AL) which utilises an existing bridge, two are for new temporary access tracks (IDs AI and AK) and one is the temporary working area for reconductoring work at existing Tower 40 (ID ALL). There are no buffer breaches in the River Don catchment.

13.6.151 The OHL crosses several small (<2 m wide) watercourses and several larger named watercourses (Burn of Sheeoch, River Dee, Gormack Burn and Kinnerie Burn). The River Dee and the Burn of Sheeoch are both designated within the River Dee SAC. All towers, and their associated construction working areas, are set back from the River Dee SAC boundary by at least 95 m at the River Dee OHL crossing and by at least 60 m at the Burn of Sheeoch OHL crossing (well over the recommended riparian buffer of 30 m for this watercourse).

13.6.152 There are several areas of forestry felling required along sections of the OHL alignment in the River Dee catchment, principally within the Durris Forest in the south and the Coldstream Plantation in the north. Most of the felling within the River Dee catchment is located well away from watercourses. However, felling is required at the OHL crossings of the Clash Burn, Burn of Sheeoch, River Dee and the Gormack Burn as well as six unnamed watercourses/drains. It is noted that felling is required within the River Dee SAC at the Burn of Sheeoch and River Dee OHL crossings. A small area of felling is also required between Tower N54 and N56 adjacent to the Loch of Park SSSI and at the OHL crossing of a small watercourse which drains towards the Loch of Park SSSI.

13.6.153 Within the River Don catchment, there is felling required at the OHL crossing of the Park Burn and close to an unnamed tributary of the Park Burn.

13.6.154 There are five new crossings of watercourses/drains for access tracks required for the construction of the OHL in the River Dee catchment (IDs 77, 78a, 78b, 85 and 89) (see **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**). Most of these are small watercourses (<2 m wide). Two new crossings (IDs 85 and 89) will require authorisation under the CAR Regulations. The remainder of the new crossings are on minor watercourses and will be covered by SEPA's GBRs and will not require specific CAR authorisation.

13.6.155 There are 14 watercourses that are crossed by existing access tracks to be used during construction (IDs 73, 74, 75, 76, 79, 80, 81, 82, 83, 84, 87, 88, 90, 92) and there are existing culverts or bridges at the watercourse crossings; details of which are provided in **Annex 13.1.1: Details of Watercourse Crossings** of **Volume 5, Appendix 13.1: Watercourse Crossings and Buffers Assessment**.

13.6.156 Existing crossings ID82, ID83 and ID84 will require to be upgraded to single span crossings to facilitate construction access. The existing stone arch bridge over the Gormack Burn (ID80) will require structural repairs to facilitate construction but will remain at the same soffit and elevation. The existing bridge deck at crossing ID81 (of the unnamed tributary of Gormack Burn) will require to be replaced and upgraded. Two of the crossings that require upgrades (IDs 81 and 84) will require authorisation under the CAR Regulations and dialogue will be maintained with SEPA during the pre-construction phase such that the appropriate authorisations can be obtained.

13.6.157 There is one watercourse in the River Don catchment that is crossed by existing access tracks to be used during construction (ID93) and no new crossings in the River Don catchment.

13.6.158 In the River Dee catchment, there are two towers (N62 and N32) and the working areas of five towers within fluvial flood risk areas. Additionally, there are two towers (N76 and N12) and the working areas of 14 towers within the surface water and small

watercourses flood risk areas (**Volume 3, Figures 13.2.1 to 13.2.26: Hydrology, Flood Risk and Buffers**). It was not possible to fully avoid the flood risk area associated with the River Dee, however the towers on either side of the River Dee are set back from the watercourse by at least 100 m. In the River Don catchment, the working area of Tower N4 infrastructure within an area of localised surface water flood risk. There is an increased risk of construction related sediment/pollution entering the water environment during flood events.

13.6.159 The Embedded and Applied Mitigation described in the sections above will avoid and minimise any adverse effects on the water environment and are considered sufficient that there are no likely significant effects to the water environment at most locations. However, there are exceptions where the relevant buffers cannot be met resulting in localised effects at these locations. These are assessed in detail in **in Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**. The main potential impacts will be from dust, sediment during construction (and felling) and hydrocarbons from plant and machinery entering the watercourses during the construction phase. With Applied Mitigation, including GEMPs which detail specific mitigation measures for dust control, working near water, watercourse crossings, forestry, working in bad weather and following good practice in the UK Forestry Standard (2023), these effects will be reduced.

13.6.160 The potential impacts on groundwater quality during construction are the risk of hydrocarbon pollution of groundwater resulting from accidental oil or fuel leaks from construction traffic and construction works. There are also potential pollution effects caused by silt and sediment disturbed during construction infiltrating into the groundwater and concrete spillages.

13.6.161 It is noted that there are no works within any watercourses which are part of the designated SAC or the Loch of Park SSSI. However, felling is required close to two SAC watercourses (the River Dee and the Burn of Skeeoch) and close to the Loch of Park SSSI, as well as close to six smaller watercourses which drain to the wider River Dee catchment. Appropriate bankside construction techniques will be followed and Applied Mitigation measures will be implemented during construction to avoid and minimise silt and pollutants entering into the water environment.

13.6.162 With Embedded and Applied Mitigation measures in place, the magnitude of the impact of increased sediment/silt runoff causing a deterioration in surface water quality in watercourses within and downstream of the Proposed Development in the River Dee catchment during construction will be temporary and of short duration and the magnitude of impact is considered to be low. However, the sensitivity of downstream receptors is high (Gormack Burn, Kinnerie Burn and River Dee catchments, which include the River Dee SAC and DWPA), with respect to water quality, and the significance of the effect is considered **Moderate** (Significant). It is noted that predicted adverse effects will be localised but given the high sensitivity of the River Dee catchment results in a **Moderate** significant effect.

13.6.163 With Embedded and Applied Mitigation measures in place, the likelihood of pollution and accidental spillage occurring is considered low; should they occur the likely severity of impact is also considered low, and the duration of any impacts are considered likely to be temporary. The magnitude of effect is therefore considered low. The sensitivity of the downstream water environment is high (Gormack Burn, Kinnerie Burn and River Dee catchments) which include the River Dee SAC and DWPA) hence the significance of the effect is considered to be **Moderate** (Significant). The sensitivity of the groundwater body is medium, hence the significance of effect on groundwater quality is **Minor** (Not Significant).

13.6.164 As there are no new watercourse crossings and all recommended riparian buffers have been met in the River Don catchment, the magnitude of impact on surface water quality will be temporary and of short duration and is considered to be negligible. The sensitivity on the watercourses/drains in the River Don catchment is medium and the significance of effect is **Negligible** (Not Significant).

13.6.165 Additional mitigation at locations where relevant buffers cannot be achieved (within the wider River SAC catchment) and for forestry felling adjacent to the SAC designated watercourses and Loch of Park SSSI will be put in place during construction. Additional mitigation is described in **Table 13.22: Committed Additional Mitigation Construction** in the additional mitigation and monitoring section of the Chapter.

Effects during construction on runoff rates and flood risk and groundwater levels/recharge

13.6.166 Flood risk areas could not be fully avoided; there are seven towers and/or working areas within fluvial flood risk areas and 16 towers and/or working areas within the areas of surface water and small watercourses flood risk in the River Dee catchment and one working area in the surface water flood risk area in the River Don catchment. Given the proximity of the proposed infrastructure at the diamond crossing location (Tower N34) to flood risk areas associated with the Gormack Burn and

tributaries, a hydraulic modelling study has been undertaken to inform the detailed design of watercourse crossings and to understand flood risk in this area. The outcomes of this study have demonstrated that as there will be no land raising in the flood risk area and no flood protection measures will be required, there will not be an increased flood risk to other receptors; this is summarised in the appended Flood Modelling Study Report (**Volume 5, Appendix 13.8: Flood Modelling Study Report**). Design mitigation for infrastructure within flood risk areas is set out in the Embedded Mitigation section and construction environmental management measures for towers, working areas and access tracks that are within flood risk areas are set out in the Applied Mitigation section.

13.6.167 Compaction of soils during construction and increased areas of hardstanding and semi-permeable surface reduces the infiltration rate leading to a greater rate and volume of surface water runoff. Clear felling forestry and other vegetation can also lead to an increase in surface water runoff rates. This can result in a "flashier" catchment response and could potentially increase flood risk downstream. However, the area of hardstanding/semi-permeable surfaces and forestry felling is small compared to the catchment areas, as described below

13.6.168 The catchment areas of the two main river catchments downstream of the proposed OHL infrastructure are given in **Table 13.21: Summary of Land-take and Felling within Main Catchment.** The total area of hardstanding or semi-permeable surfaces proposed within each catchment are 0.49 km^2 and 0.05 km^2, which represents 0.02% and <0.01% of the total catchment area of the River Dee and River Don catchments, respectively. Forestry felling within the River Dee and River Don catchments is 0.80 and 0.12 km^2, respectively, increasing the total to 0.06% and 0.01% of the catchment areas, respectively.

13.6.169 The Embedded and Applied Mitigation described above includes construction SuDS, which will attenuate all construction runoff. With Embedded and Applied Mitigation and given the small percentage of land-take (and forestry felling) compared to catchment areas and the commitment to have no land raising during construction within flood risk areas, the magnitude of effect on hydrology, runoff rates and flood risk during construction will be negligible resulting in an effect of **Negligible** significance (Not Significant).

Table 13.21: Summary of Land-take and Felling within Main Catchments

Main Watercourse	Watercourse catchment area downstream of OHL infrastructure (km^2)	Proposed Development within catchment	Total area of land-take[87] (km^2)	Area of forestry felling within catchment (km^2)	Percentage of Catchment Area	Land-take and Felling as a percentage of catchment area
River Dee	2083.1	67 towers and associated infrastructure (access tracks, working areas) (Towers N77 – N10)	0.49	0.80	0.02%	0.06%
River Don	1317.9	8 towers and associated infrastructure (access tracks, working area) (Towers N9 – N1)	0.05	0.12	<0.01%	0.01%

13.6.170 Excavations for tower foundations require excavation to a depth of 4 m. Excavations could temporarily impact local groundwater levels and local recharge. The effect is considered to be of short duration, highly localised and reversible and is considered to be of low magnitude on the groundwater body as a whole. The sensitivity of the receptor is medium and the significance of the effect is **Minor** (Not Significant). Effects on specific groundwater receptors are discussed below.

[87] Land take was estimated using shapefiles of the Proposed Development and includes all towers, construction and tower working areas and assumes a 7 m width for temporary stone, 3 m for existing access track widening and 4.5 m for new permanent access tracks as per the Project Description.

Effects during construction on PWS and Abstractions

13.6.171 A detailed description and assessment of the PWS sources and properties is provided in **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and is summarised herein. The PWS within 250 m of the Proposed Development in Section F are:

13.6.172 Woodbank well is marked on OS maps, which was also noted as a well by a local resident. However, upon visiting the location during hydrology site visits there was no evidence of the well or any water supply connections and it is considered unlikely that it is still there or in use. The marked well location is ~14 m west of the proposed temporary access track to Tower N55 and 60 m south of the proposed working area of Tower N55. The proposed tower would be at approximately at the same elevation as the well so any excavation at the tower could potentially have an effect on groundwater levels at the well (if it is still there). The effect on the groundwater levels within the well without additional mitigation is considered to be of **Minor** significance (Not Significant). Further investigation will be undertaken in advance of construction. Monitoring and mitigation measures will be put in place until it is established it is not used as a PWS.

13.6.173 Park Estate - This PWS is comprised of both a well and a spring serving three properties for domestic use. The well is used as a back-up PWS for Lochwood Cottage. There is also water distribution pipework in this area. The spring at the Park Estate is located upslope of Tower N53 and the back-up well at Lochwood Cottage is 200 m south of the proposed access track for N54. The significance of effect on the spring source from the proposed infrastructure was assessed as **Minor** significance (Not Significant) and the effect on the back-up well was assessed as **Moderate** (Significant), owing to the potential effect on groundwater levels at the well. A detailed investigation of the nearby pipe distribution network prior to construction will be required to avoid pipework during construction.

13.6.174 King's Well – at the time of writing it is unclear whether this well still serves as a supply. Further investigation is required to establish if the well is in use as a PWS prior to construction, however the assessment has been carried out on the basis that it is currently used as PWS. Monitoring and mitigation measures will be put in place until it is established it is not a PWS. The King's Well sits ~44 m south of the working area of Tower N54 and ~33 m southwest of the proposed temporary access track to the tower. The significance of effect on the well from proposed infrastructure was assessed as **Moderate** (Significant) if the well serves as a PWS**.** Further investigation will be undertaken in advance of construction but based on information from the hydrology site visits it is considered unlikely that the well is still in use as a PWS for domestic supply, as most of the nearby properties are supplied by the Park Estate supply.

13.6.175 Collonach Cottage (assumed PWS) – The PWS is assumed to be at the property and is located 105 m west of a proposed new permanent track leading to Tower N52. The significance of effect on the assumed PWS, if present, without additional mitigation is assessed to be **Minor** (Not Significant).

13.6.176 Templefold (assumed PWS) –The PWS is assumed to be at the property. The assumed PWS at Templefold is situated 230 m north of the working area around Tower N42 and 240 m from the new temporary track leading to the tower. The significance of effect on the assumed PWS, if present, without additional mitigation is assessed to be **Minor** (Not Significant).

13.6.177 East Finnercy – This PWS is a spring/borehole supply serving at least one property and likely several others in the area. There is also water distribution pipework in this area. The PWS at East Finnercy is located ~140 m south of the proposed permanent access track at Tower N38. The proposed construction works for the access track were assessed to have an effect of **Negligible** significance (Not Significant). There is a risk of disruption to the water distribution network, as the proposed permanent access track passes over the indicated pipe network.

13.6.178 Stepsbrae Steading/ Backhill of Glack – This PWS is a well/borehole supply utilised for domestic and livestock purposes and serves two properties. The PWS is situated ~114 m southwest of proposed Tower N14. The significance of the effect on the PWS from excavations at the tower was considered to be **Moderate** (Significant), due to the potential for temporarily lowering groundwater levels at the PWS during construction.

13.6.179 Lauchintilly Cottage (assumed PWS) – It is likely that this property is served by a PWS (potentially the nearby Barnyards of Heath supply) but in the absence of certainty, the PWS is assumed to be at the property. The assumed PWS is located ~195 m west of the proposed existing access track to be used during construction of Towers N9-N12. The significance of effect at the assumed PWS is assessed to be of **Negligible** significance (Not Significant).

13.6.180 Wardes Farm and Cottages (assumed PWS) – It is likely that Wardes Farm and the surrounding cottages are served by a PWS however this not confirmed at the time of writing. For the purposes of this assessment, the PWS is assumed to be at the property. An existing access track to be used for construction passes through Wardes Farm and will connect to a new permanent access track to Towers N7 and N8. The significance of effect on the assumed PWS, if present, without additional mitigation is considered to be **Moderate** (Significant).

13.6.181 Bogfold – This PWS is a well utilised for domestic and livestock purposes and serves one property. The well at Bogfold is located ~180 m northwest of the proposed Tower N7 working area. The significance of effect from construction activities on the PWS was assessed to be **Negligible** (Not Significant).

13.6.182 Leylodge Schoolhouse – This PWS is a spring serving one property for domestic and livestock purposes. The spring at Leylodge Schoolhouse is located ~98 m south of the proposed permanent access track leading to Tower N6 and ~110 m southeast of the working area around Tower N6. The effects from excavation around the access track and tower may affect temporarily groundwater levels at the spring and the significance of the effect was assessed to be **Moderate** (Significant).

13.6.183 Additional mitigation and monitoring for PWS is described in detail in the **Volume 5, Appendix 13.2: Private Water Supply and Groundwater Abstractions Assessment** and summarised in the additional mitigation and monitoring sections of this Chapter.

Effects during construction on GWDTE

13.6.184 There are three GWDTEs in Section F, which have either a moderate or high dependency on groundwater (**Volume 3, Figures 13.3.13 to 13.3.17: Groundwater Abstractions, Water Supplies and GWDTE**) and were all assessed to be of low ecological importance. A detailed assessment of the effects of the Proposed Development on each GWDTE is presented in **Volume 5, Appendix 13.5: GWDTE Assessment** and is summarised below:

13.6.185 GWDTE 6 is a moderately dependent GWDTE in an area of grassland located between Towers N49 and N50 and its sensitivity assessed to be no more than low. The working area of N50 is ~7 m south of the GWDTE and the proposed tracks ~15 m away. The magnitude of effect is considered to be low to medium, resulting in an effect of **Minor** significance (Not Significant).

13.6.186 GWDTE 7 is a moderately dependent GWDTE in an area of wetland/rush pasture, near the Bogendinny Burn, which likely has some surface water input and its sensitivity is assessed to be no more than low. Tower N13, the tower working area and access track would be within the GWDTE polygon. The magnitude of impact from construction of the tower and track on the GWDTE is assessed to be medium and the significance of effect is **Minor** (Not Significant).

13.6.187 GWDTE 8 is a high dependent GWDTE in an area of wetland/rush pasture and is fed by a groundwater spring on the flank of Drum Hill, which is also used as a PWS. The groundwater dependency was assessed as high however the ecological importance is low resulting in an overall sensitivity of medium. The working area of Tower N6 is located ~1 m north of the GWDTE and the access tracks are north of the GWDTE polygon. There is therefore potential for excavation at the tower and access track to temporarily effect groundwater levels and the quantity of water at the spring however there is uncertainty regarding the likelihood and longevity of the effect. The magnitude of change was assessed to be medium and the significance of effect is **Moderate** (Significant).

13.6.188 The area encompassing Loch of Park is a wetland and wet woodland and is designated as a SSSI. The Loch of Park is in a topographic basin and is mainly fed by surface water inputs from the Black Burn and its tributaries, although it does also have a groundwater contribution. It was assessed to have a low dependency on groundwater and is therefore not considered to be a GWDTE, as it is mainly fed by surface water (see **Annex 13.5.1: Kintore to Tealing 400 kV Overhead Line (OHL) Project – Loch of Park Site Visit – File Note** in **Volume 5, Appendix 13.5: GWDTE Assessment**). However, due to its ecological importance and sensitivity as a SSSI, potential effects on the SSSI have been assessed in detail in **Volume 5, Appendix 13.5: GWDTE Assessment** and are summarised below.

13.6.189 Tower N54 would be located ~100 m northeast of the Loch of Park SSSI and Tower N55 located ~ 60 m east. There is also proposed forestry felling along the OHL close to the SSSI boundary. Proposed temporary access track infrastructure would be between 15 m and 40 m east of the Loch of Park SSSI. Given the low groundwater dependency here, the sensitivity of the receptor (the potential GWDTE) is considered to be low. The magnitude of effect on the Loch of Park SSSI is assessed to be low, resulting in a predicted effect of Minor significance (Not Significant). Additional mitigation measures will be put in place to minimise the effect on the Loch of Park SSSI as described in detail in **Volume 5, Appendix 13.5: GWDTE Assessment** and outlined in **Table 13.22: Committed Additional Mitigation Construction**.

Effects From Adjacent OHL Sections

13.6.190 The approach to the assessment of effects within the OHL sections for hydrology, runoff and flood risk has been to assess effects to the main river catchments. As such, effects from adjacent sections of the OHL have already been captured within the assessment on the main river catchments, described in Section A – F above, and is not repeated here.

Effects from All Sections

13.6.191 There are no combined effects from all sections on hydrology, hydrogeology, geology and soils, as effects on main river catchments and SACs have been covered in Sections A – F above.

13.6.192 Summary tables of the pre- and post-additional mitigation assessment of all effects for Sections A to F are presented in the **Table 13.23: Summary of Assessment of Effects** in the Residual Effects section.

Additional Mitigation and Monitoring

13.6.193 Additional Mitigation measures for each section of the Proposed Development are detailed in **Table 13.22: Committed Additional Mitigation Construction.**

Table 13.22: Committed Additional Mitigation Construction

Mitigation Measure	Rationale	Project Stage/Timing	Responsibility
Section A			
HG21 - Additional pollution control mitigation and SuDS (eg settlement ponds and silt fences) will be installed at locations where the recommended riparian buffers could not be achieved to reduce the risk of sediment/silt runoff and spills to the water environment during construction. Any required widening/upgrades to existing access tracks (within the buffer encroachments) will occur at the opposite side of the track to the watercourse.	At watercourse buffer encroachments.	Construction	Principal Contractors. The site specific additional mitigation will be detailed within the CEMP and monitored by the ECoW during construction.
HG22 – An engineering and hydraulic assessment of the existing culvert to assess the suitability of the new access track at watercourse crossing ID12 will be carried out. Consideration to using the alternative crossing location (with new single span bridge) instead.	Proposed crossing is crossing a culverted section of a small watercourse within a field.	Pre-construction (Detailed Design)	Applicant and Principal Contractors. A CAR registration will be required for this crossing.
HG23 –The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.	Towers S161, S162, S163, S164, S165 and S167 and the working area of Tower S168 are within the fluvial flood risk area of the Dean Water. Tower S160 is within the surface water flood risk area.	Construction	Principal Contractors
HG24 - No construction materials (soils/ materials or fuels) will be placed within flood risk areas, where practicable.	As above	Construction	Principal Contractors
HG25 – Coldstream PWS – Additional surface water run-off control (eg SuDS, silt fences); micrositing of working area of Tower S195; monitoring before, during and after construction; provide an alternative water supply if required, eg via the existing mains connection or portable bowsers.	To provide increased protection to the spring sources for Coldstream PWS. Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractors. The site specific additional mitigation and monitoring will be detailed within the CEMP and monitored by the

Mitigation Measure	Rationale	Project Stage/Timing	Responsibility
			ECoW during construction.
HG26 - Balkemback Farm PWS; Upper Hayston Farm Cottage - Monitoring of the PWS well before, during and after construction.	Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractors. The site specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG27 – Nether Arniefoul - Investigation and cognisance of the distribution network before, and during construction and monitoring of the PWS before, during and after construction.	To locate and avoid pipework and monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
Section B			
HG28 - Additional pollution control mitigation and SuDS (eg settlement ponds and silt fences) will be installed at locations where the recommended riparian buffers could not be achieved to reduce the risk of sediment/silt runoff and spills to the water environment during construction. Any required widening/upgrades to existing access tracks (within the buffer encroachments) will occur at the opposite side of the track to the watercourse.	At watercourse buffer encroachments.	Construction	Principal Contractors. The site specific additional mitigation will be detailed within the CEMP and monitored by the ECoW during construction.
HG29 – Additional silt and sediment control will be put in place during forestry felling at OHL watercourse crossings of the River South Esk and the Noran Water and at the felling along the northern bank of the River South Esk.	To provide additional mitigation (silt and sediment control) to watercourses within the River South Esk SAC.	Construction	Principal Contractors. The site specific additional mitigation will be detailed within the CEMP and monitored by the ECoW during construction.
HG30 – The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.	Towers S145 and S155 are within the surface water flood risk area.	Construction	Principal Contractors
HG31 - No construction materials (soils/ materials or fuels) will be placed within flood risk areas, where practicable.	As above	Construction	Principal Contractors
HG32 – Ballindarg Burn PWS - monitoring before, during and after construction; if required, install an alternative water supply, eg using the existing mains connection or via portable bowsers.	Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractors. The site specific additional mitigation and monitoring will be detailed within the CEMP and

Mitigation Measure	Rationale	Project Stage/Timing	Responsibility
			monitored by the ECoW during construction.
HG33 - Balmadity PWS- Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers.	To provide increased protection to the abstraction source. Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractors. The site specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG34 - GWDTE1 – Access track to Tower S183 will be designed to enable subsurface flows to be maintained. Tower working area adapted to avoid GWDTE. Additional silt fences, silt traps and SuDS will be emplaced and utilised during construction on the east side of the Tower S153 and along the east side of the access track. Pre and post-construction monitoring.	To maintain subsurface flows to the GWDTE and minimise risk of construction runoff to the GWDTE.	Pre-Construction, Construction and Post Construction	Principal Contractors. The site specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
Section C			
HG35 - Additional pollution control mitigation and SuDS (eg settlement ponds and silt fences) will be installed at locations where the recommended riparian buffers could not be achieved to reduce the risk of sediment/silt runoff and spills to the water environment during construction. Any required widening/upgrades to existing access tracks (within the buffer encroachments) will occur at the opposite side of the track to the watercourse.	At watercourse buffer encroachments	Construction	Principal Contractors. The site specific additional mitigation will be detailed within the CEMP and monitored by the ECoW during construction.
HG36 – No refuelling of vehicles and plant will take place within the Buttery Burn DWPA. The section of the Proposed Development that is within the DWPA (access tracks to S99 and S102) will be noted in the CEMP and anyone working on Site in this area will be made aware of this during Site inductions. Scottish Water will be notified 3 months in advance of any works commencing on Site (in the Buttery Burn DWPA catchment).	To protect the Buttery Burn DWPA and to advise Scottish Water in advance of activity taking place in part of the DWPA.	3 months before Construction and during Construction.	Principal Contractors. The site specific additional mitigation will be detailed within the CEMP.
HG37 – The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.	Towers S105, S89, S88, S87, S86, S85, S83, S82, S56 and S48 and the working area of a further seven towers (S112, S84, S77, S55, S49, S45 and S41) are within the fluvial flood risk area of the River North Esk and its tributaries. Towers S123 and S67 as well as the working areas of 18 towers (S119, S118, S117, S109, S106, S104, S103, S101, S93, S78, S76, S75, S71, S69, S66, S63,	Construction	Principal Contractors

Mitigation Measure	Rationale	Project Stage/Timing	Responsibility
	S52 and S51) are within area of predicted surface water flood risk.		
HG38 - No construction materials (soils/ materials or fuels) will be placed within flood risk areas, where practicable.	As above	Construction	Principal Contractors
HG39 – Dalladies PWS; Thornton Estate PWS; Cowieshill PWS – Monitoring of the abstraction before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractors. The site specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG40 – Mains of Drumhendry PWS (assumed); Whins Farm PWS (assumed); Hairyholm PWS (assumed); Coldstream Farm PWS (assumed); Coldstream Cottage PWS (assumed); Parkhouse PWS (assumed) - Further investigation to establish whether there is a PWS at the assumed localities. Monitoring before, during and after construction, if required. Provide an alternative water supply if required, eg portable bowsers.	To ascertain if these are PWS and if so, determine the source location. Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	The Applicant and Principal Contractors. The site specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
Section D			
HG41 - Additional pollution control mitigation and SuDS (eg settlement ponds and silt fences) will be installed at locations where the recommended riparian buffers could not be achieved to reduce the risk of sediment/silt runoff and spills to the water environment during construction. Any required widening/upgrades to existing access tracks (within the buffer encroachments) will occur at the opposite side of the track to the watercourse.	At watercourse buffer encroachments	Construction	Principal Contractor. The site-specific additional mitigation will be detailed within the CEMP and monitored by the ECoW during construction.
HG42 - The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.	There is one tower (S23) and two working areas (S11, S38) in the fluvial flood risk areas. The working areas of 11 towers (S37, S35, S32, S30, S24, S19, S18, S16, S7, S6 and S2) are within the surface water and small watercourses flood risk areas.	Construction	Principal Contractor
HG43 - No construction materials (soils/ materials or fuels) will be placed within flood risk areas, where practicable.	As above	Construction	Principal Contractor
HG44 - Black Burn PWS, Ducat Water PWS, Burnhead of Monboddo PWS, Cotbank PWS, Jacksbank PWS – Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	To provide increased protection to the abstraction source. Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the

Mitigation Measure	Rationale	Project Stage/Timing	Responsibility
			ECoW during construction.
HG45 – Inches Farm and Cottage Detailed investigation of the supply pipework prior to construction. Monitoring before, during and after construction; provide an alternative, suitable, water supply if required, eg portable bowsers, new PWS or new mains connection.	To be cognisant of pipework to ensure the pipes are avoided or managed accordingly. Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG46 – Cairnton Properties PWS (assumed); Wattieston House PWS (assumed) - Further investigation to establish whether there is a PWS at the assumed locality. Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative, suitable, water supply if required, eg portable bowsers, new PWS or new mains connection.	To ascertain if these are PWS and if so, determine the source location. To provide increased protection to the abstraction source (if present). Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	The Applicant and Principal Contractors. The site specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG47 - Cushnie Farm PWS, Blererno PWS - Monitoring of the PWS before, during and after construction.	Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG48 - GWDTE 5 – Pre- and post-construction monitoring. Engineering mitigation if groundwater table is high.	If there is a risk of a high groundwater table, a site-specific mitigation plan for tower construction will be put in place or the tower will be microsited accordingly.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
Section E			
HG49 - The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.	The working area of towers N93, N86, N82 and N78 are located within areas of surface water and small watercourses flood risk.	Construction	Principal Contractor
HG50 - Tillybreak PWS – Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	To provide increased protection to the abstraction source. Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.

Mitigation Measure	Rationale	Project Stage/Timing	Responsibility
HG51 – Stonehouse Cottage PWS, Monearn Lodge PWS - Monitoring before, during and after construction. Provide an alternative water supply if required, eg portable bowsers.	Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG52 – Meikledams PWS (assumed) - Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; provide an alternative, suitable, water supply if required, eg portable bowsers, new PWS or new mains connection.	To ascertain if this is a PWS and if so, determine the source location. Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	The Applicant and Principal Contractors. The site specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG53 – Wester Durris PWS – Investigation and cognisance of the distribution network before, and during construction. Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers.	To be cognisant of pipework to ensure the pipes are avoided or managed accordingly. Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG54 – Towers N77, N78, N83 – Tower working areas will be microsited further to avoid excavation (N83) or minimise impact on peat (N77 and N78). Peat stored temporarily prior to reuse will be kept covered and/or watered to minimise oxidation. Relevant best practice measures and mitigation set out in the PLHRA (**Volume 5, Appendix 13.6: Peat Landslide Hazard and Risk Assessment (PLHRA)**) will be implemented during construction. Post-construction monitoring will be undertaken in reuse and restoration areas to ensure vegetation re-establishes, with additional seeding with locally appropriate seed stock if monitoring indicates the need.	To maintain carbon stock of peat permanently displaced from crane foundation footprints.	Construction and Post Construction	Principal Contractors. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
Section F			
HG55 - Additional pollution control mitigation and SuDS (eg settlement ponds and silt fences) will be installed at locations where the recommended riparian buffers could not be achieved to reduce the risk of sediment/silt runoff and spills to the water environment during construction. Any required widening/upgrades to existing access tracks (within the buffer encroachments) will occur at the opposite side of the track to the watercourse.	At watercourse buffer encroachments.	Construction	Principal Contractor. The site-specific additional mitigation will be detailed within the CEMP and monitored by the ECoW during construction.
HG56 – Additional silt and sediment control measures will be put in place during forestry felling at OHL watercourse crossings of the Burn of Sheeoch and the River Dee.	To provide additional mitigation (silt and sediment control) to watercourses within the River Dee SAC.	Construction	Principal Contractors. The site specific additional mitigation will be detailed within the

Mitigation Measure	Rationale	Project Stage/Timing	Responsibility
			CEMP and monitored by the ECoW during construction.
HG57 – Additional silt and sediment control measures will be put in place during forestry felling upgradient of the Loch of Park SSSI.	To provide additional mitigation (silt and sediment runoff control) towards the Loch of Park SSSI.	Construction	Principal Contractors. The site specific additional mitigation will be detailed within the CEMP and monitored by the ECoW during construction.
HG58 - The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.	There are two towers (N62 and N32) and the working areas of five towers (N61, N55, N45, N44 and N34) within fluvial flood risk areas. There are two towers (N76 and N12) and the working areas of 15 towers within the surface water and small watercourses flood risk areas.	Construction	Principal Contractor
HG59 - No construction materials (soils/ materials or fuels) will be placed within flood risk areas, where practicable.	As above	Construction	Principal Contractor
HG60 - Woodbank PWS, King's Well PWS – Further investigation to establish whether the wells are still in use will be undertaken before construction. This will inform appropriate mitigation. Monitoring of the well before, during and after construction.	Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG61 - Park Estate PWS – Investigation and cognisance of the distribution network before, and during construction; surface water run-off control (eg SuDS, silt fences); Monitoring before, during and after construction; Provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG62 – Collonach Cottage PWS (assumed); Templefold PWS (assumed); Wardes Farm and Cottage PWS (assumed) - Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers. Cognisance of the distribution network before, and during construction.	To ascertain if these are PWS and if so, determine the source location. To provide increased protection to the abstraction source and distribution pipework (if present). Monitoring to assess if there are effects and to	Pre-Construction, Construction and Post Construction	The Applicant and Principal Contractors. The site specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.

Mitigation Measure	Rationale	Project Stage/Timing	Responsibility
	provide alternative water supply, if required.		
HG63 –Lauchintilly Cottage PWS (assumed) - Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers.	To ascertain if these are PWS and if so, determine the source location. Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	The Applicant and Principal Contractors. The site specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG64 - East Finnercy PWS – Investigation and cognisance of the distribution network before, and during construction; Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG65 - Stepsbrae Steading/ Backhill of Glack PWS; Leylodge Schoolhouse PWS – Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG66 - Bogfold PWS - Monitoring before, during and after construction.	Monitoring to assess if there are effects and to provide alternative water supply, if required.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific monitoring will be detailed within the CEMP and monitored by the ECoW during construction.
HG67 - GWDTE 6 – Access track will be designed to enable subsurface flows to be maintained. Additional SuDS, silt traps/fences will be utilised at the north side of the Tower N50 working area and north/west (downslope) side of the access track.	To maintain subsurface flows to the GWDTE and minimise risk of construction runoff to the GWDTE.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific additional mitigation will be detailed within the CEMP and monitored by the ECoW during construction.
HG68 - GWDTE 7 – Access track will be designed to enable subsurface flows to be maintained. Additional SuDS, silt traps/fences on towers and access tracks south/east sides.	To maintain subsurface flows to the GWDTE and minimise risk of construction runoff to the GWDTE.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific additional mitigation will be detailed within the CEMP and monitored by the ECoW during construction.

Mitigation Measure	Rationale	Project Stage/Timing	Responsibility
HG69 - GWDTE 8 – Access track will be designed to enable subsurface flows to be maintained. Additional SuDS, silt traps/fences on towers and access tracks north and south sides (different tracks). Pre- and post-construction monitoring of groundwater levels. Engineering mitigation if groundwater table is high, and adaption of tower and working area, if required.	To maintain subsurface flows to the GWDTE and minimise risk of construction runoff to the GWDTE. To assess the risk (and mitigate for) a high water table in this area.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific additional mitigation will be detailed within the CEMP and monitored by the ECoW during construction.
HG70 – Loch of Park SSSI – Access track will be designed to enable subsurface flows to be maintained. Additional SuDS, silt traps/fences on towers and access tracks west side.	To maintain subsurface flows to the Loch of Park and minimise risk of construction runoff to the SSSI.	Pre-Construction, Construction and Post Construction	Principal Contractor. The site-specific additional mitigation will be detailed within the CEMP and monitored by the ECoW during construction.

Residual Construction Effects

13.6.194 With the Additional Mitigation and Monitoring described in **Table 13.22: Committed Additional Mitigation Construction** and the detailed mitigation and best practice measures included within the technical reports in **Volume 5, Appendices 13.1 to 13.6 (Appendix 13.1: Watercourse Crossing and Buffers Assessment**, **Appendix 13.2: Private Water Supply and Groundwater Abstraction Assessment**, **Appendix 13.3: Peat Depth Survey Report**, **Appendix 13.4: Outline Peat Management Plan (PMP)**, **Appendix 13.5: Groundwater Dependent Terrestrial Ecosystems (GWDTE) Assessment** and **Appendix 13.6: Peat Landslide Hazard and Risk Assessment (PLHRA)**), the residual construction effects for each Section are presented in detail in **Table 13.23: Summary of Assessment of Effects - Section A to Section F** and summarised below:

Table 13.23: Summary of Assessment of Effects – Section A to F

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
Section A							
Water Quality - increased sediment/silt runoff	Dighty Water catchment	Low	Low	Minor	Additional pollution control mitigation and SuDS (eg settlement ponds and silt fences) installed at locations where the recommended riparian buffers could not be achieved to reduce the risk of sediment/silt runoff and spills to the water environment during construction. Any required widening/upgrades to existing access tracks (within the buffer encroachments) will occur at the opposite side of the track to the watercourse.	Negligible	Negligible
	Dean Water catchment, includes River Tay SAC and River Tay DWPA (some 32 km downstream)	High	Low	**Moderate**	As above and no construction materials (soils/ materials or fuels) will be placed within flood risk areas, where practical.	Negligible	Negligible
	River Tay DWPA	High	Negligible	Negligible	As above	Negligible	Negligible
Water Quality - pollution and accidental spillage	Dighty Water catchment	Low	Low	Minor	As above	Negligible	Negligible
	Dean Water catchment, includes River Tay SAC	High	Low	**Moderate**	As above	Negligible	Negligible
	River Tay DWPA	High	Negligible	Negligible	As above	Negligible	Negligible
	Groundwater	Medium	Low	Minor	As above	Negligible	Negligible
Runoff rates and flood risk	Dighty Water catchment	High	Negligible	Negligible	Engineering and hydraulic assessment to assess suitability of crossing ID12 and consideration to using the alternative crossing location (with new single span bridge) instead.	Negligible	Negligible
	Dean Water catchment	High	Negligible	Negligible	The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to	Negligible	Negligible

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
					receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.		
Groundwater levels and local recharge	Groundwater body	Medium	Low	Minor	None	Low	Minor
Private Water Supplies	Balkemback Farm	Low	Negligible	Negligible	Monitoring of the PWS and well before, during and after construction	Negligible	Negligible
	Coldstream	Low	Spring 1 - Negligible; Spring 2 - High	Spring 1 - Negligible; Spring 2 - **Moderate**	Additional surface water run-off control (eg SuDS, silt fences); micrositing of working area of Tower S195; monitoring before, during and after construction; provide an alternative water supply if required, eg via the existing mains connection or portable bowsers.	Spring 1 - Negligible; Spring 2 - Low	Spring 1 - Negligible; Spring 2 - Minor
	Nether Arniefoul	Low	Negligible	Negligible	Investigation and cognisance of the distribution network before, and during construction and monitoring of the PWS before, during and after construction.	Negligible	Negligible
	Upper Hayston Farm Cottage	Low	Negligible	Negligible	Monitoring of the PWS and well before, during and after construction	Negligible	Negligible
Section B							
Water Quality - increased sediment/silt runoff	River South Esk catchment, includes River South Esk SAC	High	Low	**Moderate**	Additional pollution control mitigation and SuDS (eg settlement ponds and silt fences) installed at locations where the recommended riparian buffers could not be achieved to reduce the risk of sediment/silt runoff and spills to the water environment during construction. Any required widening/upgrades to existing access tracks (within the buffer encroachments) will occur at the opposite side of the track to the watercourse. Additional silt and sediment control will be put in place during forestry felling at OHL watercourse crossings of the River South Esk and the Noran Water and at the felling along the northern bank of the River South Esk. No construction materials (soils/ materials or fuels) will be placed within flood risk areas, where practical.	Negligible	Negligible

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
Water Quality - pollution and accidental spillage	River South Esk catchment, includes River South Esk SAC	High	Low	**Moderate**	As above	Negligible	Negligible
	Groundwater	Medium	Low	Minor	As above	Negligible	Negligible
Runoff rates and flood risk	River South Esk catchment	High	Negligible	Negligible	The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.	Negligible	Negligible
Groundwater levels and local recharge	Groundwater body	Medium	Low	Minor	None	Low	Minor
Private Water Supplies	Ballindarg Burn	Low	Negligible	Negligible	Monitoring before, during and after construction; if required, install an alternative water supply, eg using the existing mains connection or via portable bowsers.	Negligible	Negligible
	Balmadity	Medium	Negligible to Low	Negligible to Minor	Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers.	Negligible	Negligible
GWDTE	GWDTE 1	Medium	Medium	**Moderate**	Access track to Tower S153 will be designed to enable subsurface flows to be maintained. Additional silt fences, silt traps and SuDS will be emplaced and utilised during construction on the east side of the Tower S153 and along the east side of the access track.	Low	Minor
Section C							
Water Quality - increased sediment/silt runoff	Black Burn	Low	Low	Minor	Additional pollution control mitigation and SuDS (eg settlement ponds and silt fences) will be installed at locations where the recommended riparian buffers could not be achieved to reduce the risk of sediment/silt runoff and spills to the water environment during construction. Any required widening/upgrades to existing access tracks (within the buffer encroachments) will occur at the opposite side of the track to the watercourse. No construction materials (soils/	Negligible	Negligible
	Dowrie Burn, Cruick Water and River North Esk	Medium	Low	Minor		Negligible	Negligible
	West Water	High	Low	**Moderate**		Negligible	Negligible
	Buttery Burn DWPA	High	Negligible	Negligible		Negligible	Negligible

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
					materials or fuels) will be placed within flood risk areas, where practical. No refuelling of vehicles and plant will place within the Buttery Burn DWPA. The section of the Proposed Development that is within the DWPA (access tracks to S99 and S102) will be noted in the CEMP and anyone working on Site in this area will be made aware of this during Site inductions. Scottish Water will be notified 3 months in advance of any works commencing on Site (in the Buttery Burn DWPA catchment).		
Water Quality - pollution and accidental spillage	Black Burn	Low	Low	Minor	As above	Negligible	Negligible
	Dowrie Burn, Cruick Water and River North Esk	Medium	Low	Minor		Negligible	Negligible
	West Water	High	Low	**Moderate**		Negligible	Negligible
	Buttery Burn DWPA	High	Negligible	Negligible		Negligible	Negligible
	Groundwater	Medium	Low	Minor		Negligible	Negligible
Runoff rates and flood risk	River North Esk catchment	High	Negligible	Negligible	The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.	Negligible	Negligible
Groundwater levels and local recharge	Groundwater body	Medium	Low	Minor	None	Low	Minor
Private Water Supplies	Dalladies	Medium	Negligible	Negligible	Monitoring before, during and after construction.	Negligible	Negligible
	Mains of Drumhendry	Medium	Medium	**Moderate**	Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; if required, install an alternative water supply, eg via a mains connection or portable bowsers.	Negligible to Low	Negligible to Minor

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
	Whins Farm	Medium	Medium	**Moderate**	Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; if required, install an alternative water supply, eg via a mains connection or portable bowsers.	Negligible to Low	Negligible to Minor
	Cowieshill	Medium	Low	Minor	Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	Negligible	Negligible
	Hairyholm	Medium	Low	Minor	Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; if required, install an alternative water supply, eg via a mains connection or portable bowsers.	Negligible	Negligible
	Coldstream Farm (Laurencekirk)	Medium	Low	Minor	Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; if required, install an alternative water supply, eg via a mains connection or portable bowsers.	Negligible	Negligible
	Coldstream Cottage	Medium	Negligible	Negligible	Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; if required, install an alternative water supply, eg via a mains connection or portable bowsers.	Negligible	Negligible
	Parkhouse	Medium	Negligible	Negligible	Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; if required, install an alternative water supply, eg via a mains connection or portable bowsers.	Negligible	Negligible
	Thornton Estate	Medium	Negligible	Negligible	Monitoring before, during and after construction	Negligible	Negligible
Geology	North Esk and West Water Palaeochannels SSSI	Medium	Negligible	Negligible	None	Negligible	Negligible
Section D							
Water Quality - increased	Bervie Water and Carron Water catchments	High	Low	**Moderate**	Additional pollution control mitigation and SuDS (eg settlement ponds and silt fences) will be installed at locations where the recommended riparian buffers could not be	Negligible	Negligible

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
sediment/silt runoff					achieved to reduce the risk of sediment/silt runoff and spills to the water environment during construction. Any required widening/upgrades to existing access tracks (within the buffer encroachments) will occur at the opposite side of the track to the watercourse. No construction materials (soils/ materials or fuels) will be placed within flood risk areas, where practical.		
Water Quality - pollution and accidental spillage	Bervie Water and Carron Water catchments	High	Low	**Moderate**	As above	Negligible	Negligible
	Groundwater	Medium	Low	Minor	As above	Negligible	Negligible
Runoff rates and flood risk	Bervie Water and Carron Water catchments	High	Negligible	Negligible	The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.	Negligible	Negligible
Groundwater levels and local recharge	Groundwater body	Medium	Low	Minor	None	Low	Minor
Private Water Supplies	Black Burn	Low	Negligible to Low	Negligible to Minor	Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg via the existing mains connection or portable bowsers.	Negligible	Negligible
	Ducat Water	Low	Low	Minor	Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg via the existing mains connection or portable bowsers.	Negligible	Negligible
	Cairnton Properties	Medium	Negligible to Low	Negligible to Minor	Further investigation to establish whether there is a PWS at the assumed locality. Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg via the existing mains connection or portable bowsers.	Negligible	Negligible

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
	Cushnie Farm	Low	Negligible	Negligible	Monitoring before, during and after construction	Negligible	Negligible
	Burnhead of Monboddo	Spring - Medium Stream - Low	Low	Minor	Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	Negligible	Negligible
	Wattieston House	Medium	Low	Minor	Further investigation to establish whether there is a PWS at the assumed locality, which appears likely here. Monitoring before, during and after construction; provide an alternative, suitable, water supply if required, eg portable bowsers, new PWS or new mains connection.	Negligible	Negligible
	Inches Farm and Cottage	Medium	Medium	**Moderate**	Detailed investigation of the supply pipework prior to construction. Monitoring before, during and after construction; provide an alternative, suitable, water supply if required, eg portable bowsers, new PWS or new mains connection,	Low	Minor
	Cotbank	Medium	Medium	**Moderate**	Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	Low	Minor
	Jacksbank	Spring - Medium Borehole - Medium	Low	Minor	Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	Negligible	Negligible
	Blererno	Medium	Negligible	Negligible	Monitoring before, during and after construction.	Negligible	Negligible
	Fetteresso Substation	Medium	Negligible	Negligible	None	Negligible	Negligible
GWDTE	GWDTE 2	Low	Low	Minor	None	Low	Minor
	GWDTE 3	Low	Negligible	Negligible	None	Negligible	Negligible
	GWDTE 4	Low	Negligible	Negligible	None	Negligible	Negligible

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
	GWDTE 5	Low	Medium	Minor	Pre- and post-construction monitoring. Engineering mitigation if groundwater table is high.	Low to Medium	Neglible to Minor
	GWDTE 5	Low	Medium	Minor	Pre- and post-construction monitoring. Engineering mitigation if groundwater table is high.	Low to Medium	Neglible to Minor
Section E							
Water Quality - increased sediment/silt runoff	Cowie Water catchment	High	Negligible	Negligible	None	Negligible	Negligible
Water Quality - pollution and accidental spillage	Cowie Water catchment	High	Negligible	Negligible	None	Negligible	Negligible
	Groundwater	Medium	Low	Minor	None	Negligible	Negligible
Runoff rates and flood risk	Cowie Water catchment	High	Negligible	Negligible	The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.	Negligible	Negligible
Groundwater levels and local recharge	Groundwater body	Medium	Low	Minor	None	Low	Minor
Private Water Supplies	Stonehouse Cottage	Medium	Negligible	Negligible	Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers	Negligible	Negligible
	Tillybreak	Medium	Low	Minor	Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers	Negligible	Negligible
	Monearn Lodge	Medium	Negligible	Negligible	Monitoring before, during and after construction. Provide an alternative water supply if required, eg portable bowsers.	Negligible	Negligible
	Meikledams	Medium	Negligible	Negligible	Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after	Negligible	Negligible

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
					construction. Provide an alternative water supply if required, eg portable bowsers.		
	Wester Durris	Medium	Negligible to low	Negligible to Minor	Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers. Investigation and cognisance of the distribution network before, and during construction.	Negligible to Low	Negligible to Minor
Peat	Peat soils (Durris Forest)	Low	Low	Minor	Towers N77, N78, N83 – Tower working areas will be microsited further to avoid excavation (N83) or minimise impact on peat (N77 and N78). Peat stored temporarily prior to reuse will be kept covered and/or watered to minimise oxidation. Post-construction monitoring will be undertaken in reuse and restoration areas to ensure vegetation re-establishes, with additional seeding with locally appropriate seed stock if monitoring indicates the need.	Negligible	Negligible
Section F							
Water Quality - increased sediment/silt runoff	River Dee catchment (includes River Dee SAC and DWPA)	High	Low	**Moderate**	Additional pollution control mitigation and SuDS (eg settlement ponds and silt fences) installed at locations where the recommended riparian buffers could not be achieved to reduce the risk of sediment/silt runoff and spills to the water environment during construction. Any required widening/upgrades to existing access tracks (within the buffer encroachments) will occur at the opposite side of the track to the watercourse. Additional silt and sediment control measures will be put in place during forestry felling at OHL watercourse crossings of the Burn of Sheeoch and the River Dee; No construction materials (soils/ materials or fuels) will be placed within flood risk areas, where practical.	Negligible	Negligible
	River Don catchment	Medium	Negligible	Negligible	As above	Negligible	Negligible
Water Quality - pollution and accidental spillage	River Dee catchment (includes River Dee SAC and DWPA)	High	Low	**Moderate**	As above	Negligible	Negligible
	River Don catchment	Medium	Negligible	Negligible	As above	Negligible	Negligible

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
	Groundwater	Medium	Low	Minor	As above	Negligible	Negligible
Runoff rates and flood risk	River Dee catchment	High	Negligible	Negligible	The Principal Contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Use of access tracks (if flooded) and construction will cease during flood events.	Negligible	Negligible
	River Don catchment	High	Negligible	Negligible	None	Negligible	Negligible
Groundwater levels and local recharge	Groundwater body	Medium	Low	Minor	None	Low	Minor
PWS	Woodbank	Low	Medium	Minor	Further investigation to establish whether the well is still in use will be undertaken before construction. This will inform appropriate mitigation. Monitoring and mitigation, if it is a PWS.	Negligible to Low	Negligible to Minor
	Park Estate including Lochwood Cottage	Spring - Medium; Well - Medium	Spring - Low Well - Medium	Spring - Minor Well - **Moderate**	Investigation and cognisance of the distribution network before, and during construction; monitoring before, during and after construction; provide an alternative water supply if required, eg, portable bowsers, new PWS or new mains connection.	Negligible	Negligible
	King's Well	Medium	Medium	**Moderate (if still in use)**	Further investigation to establish whether the well is in use will be undertaken before construction. This will inform appropriate mitigation. Monitoring and mitigation; investigation and cognisance of the distribution network before, and during construction.	Negligible to Low	Negligible to Minor (to be confirmed once it is established whether well is in use)
	Collonach Cottage	Medium	Low	Minor	Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers.	Negligible	Negligible
	Templefold	Medium	Low	Minor	Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after	Negligible	Negligible

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
					construction; provide an alternative water supply if required, eg portable bowsers.		
	East Finnercy	Medium	Negligible	Negligible	Investigation and cognisance of the distribution network before, and during construction; Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers.	Negligible	Negligible
	Stepsbrae Steading/Backhill of Glack	Medium	Medium	**Moderate**	Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	Negligible	Negligible
	Lauchintilly Cottage	Medium	Negligible	Negligible	Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers.	Negligible	Negligible
	Wardes Farm and Cottage	Medium	Medium	**Moderate**	Further investigation to establish whether there is a PWS at the assumed locality. Surface water run-off control (eg SuDS, silt fences); Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	Negligible to Low	Negligible to Minor
	Bogfold	Medium	Negligible	Negligible	Monitoring before, during and after construction.	Negligible	Negligible
	Leylodge Schoolhouse	Medium	Medium	**Moderate**	Investigation and cognisance of the distribution network before, and during construction; Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection.	Negligible to Low	Negligible to Minor
GWDTE	GWDTE 6	Low	Low to Medium	Minor	Access track will be designed to enable subsurface flows to be maintained. Additional SuDS, silt traps/fences will be utilised at the north side of the Tower N50 working area and north/west (downslope) side of the access track.	Negligible to Low	Negligible to Minor
	GWDTE 7	Low	Medium	Minor	Access track will be designed to enable subsurface flows to be maintained. Additional SuDS, silt traps/fences on towers and access tracks south/east sides.	Low	Minor

	Receptor	Sensitivity	Magnitude	Significance or Effect (before additional mitigation)	Additional Mitigation	Magnitude of Effect	Significance of Residual Effect Following Additional Mitigation
	GWDTE 8	Medium	Medium	**Moderate**	Access track will be designed to enable subsurface flows to be maintained. Additional SuDS, silt traps/fences on towers and access tracks north and south sides (different tracks). Pre- and post-construction monitoring of groundwater levels. Engineering mitigation if groundwater table is high, and adaption of tower and working area, if required.	GWDTE 8	Medium
	Loch of Park SSSI (not a GWDTE, but has a low groundwater input and is mainly surface water fed)	Low	Low	Minor	Additional SuDS, silt traps/fences on the west and south side of Towers N54, N55 and the proposed access tracks to both towers. Access track will be designed to enable subsurface flows to be maintained. Additional silt and sediment control measures will be put in place during forestry felling upgradient of the Loch of Park SSSI.	Negligible	Negligible

- Section A - the magnitude of the residual effect on water quality to downstream watercourses and receptors, including the River Tay SAC, is negligible resulting in a residual effect of **Negligible** significance. The residual effect on the River Tay DWPA, which is over 32 km downstream of the Proposed Development, is of **Negligible** significance. The residual effect on runoff rates and flood risk is **Negligible**. The residual effect on the groundwater body is **Minor**. The residual effects on PWS and abstractions are **Negligible,** except for Coldstream PWS which is **Minor**.
- Section B - the magnitude of the residual effect on water quality to downstream watercourses and receptors, including the River South Esk SAC, is negligible resulting in a residual effect of **Negligible** significance. The residual effect on runoff rates and flood risk is **Negligible**. The residual effect on the groundwater body is **Minor**. The residual effects on PWS and abstractions is **Negligible** for both Ballindarg Burn and Balmadity PWS. The residual effect on GWDTE1 is of **Minor** significance.
- Section C - the magnitude of the residual effect on water quality to downstream watercourses and receptors is negligible resulting in a residual effect of **Negligible** significance. The residual effect on the Buttery Burn DWPA is **Negligible**. The residual effect on runoff rates and flood risk is **Negligible**. The residual effect on the groundwater body is **Minor**. The residual effects on PWS and abstractions is **Negligible or Minor** for the PWS in Section C. The residual effect on geology receptors (the North Esk and West Water Palaeochannels SSSI) is **Negligible**.
- Section D - the magnitude of the residual effect on water quality to downstream watercourses and receptors is negligible resulting in a residual effect of **Negligible** significance. The residual effect on runoff rates and flood risk is **Negligible**. The residual effect on the groundwater body is **Minor**. The residual effects on PWS and abstractions is **Negligible** for all PWS/abstractions in Section D except Cotbank PWS and Inches Farm PWS where the significance of the residual effect is **Minor**. The residual effect on GWDTEs 3 and 4 is **Negligible** and GWDTEs 2 and 5 are **Negligible to Minor.**
- Section E - the magnitude of the residual effect on water quality to downstream watercourses and receptors is negligible resulting in a residual effect of **Negligible** significance. The residual effect on runoff rates and flood risk is **Negligible**. The residual effect on the groundwater body is **Minor**. The residual effects on PWS in Section E is **Negligible to Minor**. The residual effect on peat soils in Durris Forest is **Negligible**.
- Section F - the magnitude of the residual effect on water quality to downstream watercourses and receptors, including the River Dee SAC, is negligible resulting in a residual effect of **Negligible** significance. The residual effect on the River Dee DWPA, which is over 10 km downstream of the Proposed Development, is of **Negligible** significance. The residual effect on runoff rates and flood risk is **Negligible**. The residual effect on the groundwater body is **Minor**. The residual effects on PWS and abstractions is either **Negligible** or **Minor** for the PWS in Section F. The residual effect on GWDTE's 6, 7 and 8 are **Negligible** or **Minor.** The residual effect on the Loch of Park SSSI is **Negligible.**

13.7 Assessment of Likely Significant Effects - Operation

Predicted Operational Effects

13.7.1 The potential operational impacts of Proposed Development are associated with the permanent infrastructure (tower bases, CSEC and permanent tracks) and any required maintenance work during operation, which will be infrequent.

13.7.2 During operation, the minor increase in hardstanding areas (towers legs, CSEC and permanent tracks) within each rivers' catchment in Sections A – F could result in a very slight increase in the rate and volume of surface water runoff, leading to a potential increase in flood risk in watercourses downstream. It is noted that Embedded and Applied Mitigation will be in place and runoff will be attenuated and there will no land raising in flood risk areas. Given the size of the areas of hardstanding compared to the catchment areas of the downstream watercourses, the magnitude of the effect on flood risk downstream is considered to be **Negligible**, resulting in an effect of **Negligible** significance for all catchments.

Additional Mitigation

13.7.3 No additional mitigation is proposed during operation.

Residual Operational Effects

13.7.4 The residual effect on flood risk is **Negligible** during operation.

13.8 Assessment of Likely Significant Effects - Decommissioning

13.8.1 Decommissioning effects are unlikely to be of greater magnitude than construction effects assuming the correct environmental controls being in place. Therefore, on this basis, decommissioning effects are not assessed in detail and are assumed to be, at worst, no greater than construction effects.

13.9 Assessment of Residual Cumulative Effects

Introduction

13.9.1 Predicted adverse effects on Hydrology, Hydrogeology, Geology and Soils arising from the construction and operation of the Proposed Development have the potential to contribute to cumulative effects upon surface and ground water quality and quantity, PWS, GWDTEs and effects on runoff rates and flood risk.

13.9.2 The residual effects on peat and geology receptors for the Proposed Development were assessed to be **Negligible** and given that the areas of peat within the Proposed Development are very localised and the cumulative developments are located well away from these locations, there will be no cumulative effects on these receptors.

Findings of the Cumulative Assessment

13.9.3 The potential for significant cumulative environmental effects of the Proposed Development has been considered with reference to two groups of reasonably foreseeable developments. The assessments are presented in the following tables:

- **Table 13.24: Cumulative Assessment: Intra (Associated) Developments** provides a cumulative assessment of the Proposed Development with the Intra (Associated) Developments defined in **Volume 2, Chapter 16: Cumulative Effects**. These are the substation proposals at Emmock and Hurlie which would be directly connected with the proposed OHL; and
- **Table 13.25: Cumulative Assessment: Inter Developments** provides a cumulative assessment of the Proposed Development and Intra (Associated) Developments with other reasonably foreseeable SSEN Transmission and third party developments (collectively, referred to as Inter Developments) as defined in **Volume 2, Chapter 16: Cumulative Effects**. Projects over 500 m away from the Proposed Development have been scoped out as any effects on Hydrology, Hydrogeology, Geology and Soils at this distance are considered unlikely to occur.

13.9.4 A brief commentary is then provided following **Table 13.25** on the predicted cumulative effects of the Proposed Development in combination with the Intra and Inter projects considered in the assessment.

Table 13.24: Cumulative Assessment: Intra (Associated) Developments (SSEN Transmission Developments Required to Connect the Proposed Development)

	Construction		Operation
Project	**Effects during construction on surface and ground water quality and quantity (and PWS, abstractions and GWDTE)**	**Effect on runoff rates and flood risk**	**Effect on runoff rates and flood risk**
Emmock 400 kV substation	The Proposed Development is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**). The EIA submitted in support of the planning application for the Emmock 400 kV substation concludes that there is a negligible effect on surface and ground water quality, including PWS. There is no effect on GWDTE. Assuming that SSEN Transmission procedures, including the adoption of all management plans, embedded, and applied mitigation, are employed for the construction of the substation, then with the information available at this stage, there is no likely significant cumulative effects predicted from the Proposed Development and the Emmock 400 kV substation.	The Proposed Development is not predicted to have a significant effect upon runoff rates and flood risk. The EIA submitted in support of the planning application for the Emmock 400 kV substation concludes that there is a negligible effect on runoff rates and flood risk. No likely significant cumulative effects are predicted from the Proposed Development and the Emmock 400 kV substation.	The Proposed Development is not predicted to have a significant effect upon runoff rates and flood risk. The EIA submitted in support of the planning application for the Emmock 400 kV substation concludes that there is a negligible effect on runoff rates and flood risk. No likely significant cumulative effects are predicted from the Proposed Development and the Emmock 400 kV substation.
Hurlie 400 kV substation (LT486)	The Proposed Development is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**). The EIA submitted in support of the planning application for the Hurlie 400 kV substation concludes that there is a negligible effect on surface and ground water quality, including PWS. Assuming that SSEN Transmission procedures, including the adoption of all management plans, embedded, and applied mitigation, are employed for the construction of the substation, then with the information available at this stage, there is no likely significant cumulative effects predicted from the Proposed Development and the Hurlie 400 kV substation.	The Proposed Development is not predicted to have a significant effect upon runoff rates and flood risk. The EIA submitted in support of the planning application for the Hurlie 400 kV substation concludes that there is a negligible effect on runoff rates and flood risk. No likely significant cumulative effects are predicted from the Proposed Development and the Hurlie 400 kV substation.	The Proposed Development is not predicted to have a significant effect upon runoff rates and flood risk. The EIA submitted in support of the planning application for the Hurlie 400 kV substation concludes that there is a negligible effect on runoff rates and flood risk. No likely significant cumulative effects are predicted from the Proposed Development and the Hurlie 400 kV substation.
Overall Intra Cumulative Assessment Summary	The nature of these two intra developments is such that they are unlikely to have significant effects upon hydrology and hydrogeology and given the information that is available at present, it is unlikely that there will be significant cumulative effects in the construction or operation phase from the Proposed Development and the Hurlie and Emmock substations.		

Table 13.25: Cumulative Assessment: Inter Developments (Other SSEN Transmission Developments and Third Party Developments)

	Construction		Operation
Project	**Effects during construction on surface and ground water quality and quantity (and PWS)**	**Effect on runoff rates and flood risk**	**Effect on runoff rates and flood risk**
Emmock and Tealing Overhead Line Tie-Ins and Tie-Backs	The Proposed Development is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**). The nature of the Tie-ins and Tie-Backs project is such that a small percentage of the project takes place within the same catchment as the Proposed Development (the Fithie and Tealing Burns). Within this catchment area, construction work will require a small degree of earth works. Assuming that SSEN Transmission procedures, including the adoption of all management plans referenced in **Table 13.14: Applied Mitigation**, are employed for the construction of the Tie-ins and Tie-Backs project, then with the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and the Emmock and Tealing OHL Tie-Ins and Tie-backs.	The Proposed Development is not predicted to have a significant effect upon runoff rates and flood risk during the construction. The nature of the project is such that negligible hardstanding areas are required during the construction phase. No likely significant cumulative effects are predicted from the Proposed Development and the Emmock and Tealing OHL Tie-Ins and Tie-backs.	The Proposed Development is not predicted to have a significant effect upon runoff rates and flood risk in the operational phase. The nature of the project is not likely to cause significant effects upon runoff and flood risk due to the likely negligible additional hardstanding areas that are required. No likely significant cumulative effects are predicted from the Proposed Development and the Emmock and Tealing OHL Tie-Ins and Tie-backs.
Tealing to Westfield 275 kV OHL Upgrade (to 400 kV)	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**). The nature of the OHL upgrade project is such that there is no additional ground works and therefore on the assumption that SSEN Transmission procedures, including the adoption of all management plans referenced in **Table 13.14: Applied Mitigation**, are employed during construction then with the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and the Tealing to Westfield 275 kV OHL Upgrade.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk during the construction. The nature of the OHL upgrade project is such that there is no additional runoff and therefore no likely significant cumulative effects are predicted from the Proposed Development and the Tealing to Westfield 275 kV OHL Upgrade.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk during the construction. The nature of the OHL upgrade project is such that there is no additional runoff and therefore no likely significant cumulative effects are predicted from the Proposed Development and the Tealing to Westfield 275 kV OHL Upgrade.
Alyth to Tealing 275 kV OHL Upgrade (to 400 kV)	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied**	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk during the construction.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk during the construction.

	Construction		Operation
	Mitigation and Table 13.22: Committed Additional Mitigation Construction). The nature of the OHL upgrade project is such that there is no additional ground works and therefore on the assumption that SSEN Transmission procedures, including the adoption of all management plans referenced in **Table 13.14: Applied Mitigation**, are employed during construction then with the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and the Alyth to Tealing 275 kV OHL Upgrade.	The nature of the OHL upgrade project is such that there is no additional runoff and therefore no likely significant cumulative effects are predicted from the Proposed Development and the Alyth to Tealing 275 kV OHL Upgrade.	The nature of the OHL upgrade project is such that there is no additional runoff and therefore no likely significant cumulative effects are predicted from the Proposed Development and the Alyth to Tealing 275 kV OHL Upgrade.
Fetteresso Wind Farm Grid Connection and Access Corridor	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**) The information available on this project does not identify any likely significant effects in isolation. With the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and the Fetteresso Wind Farm Grid Connection and Access Corridor.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk during construction. The information available on this project does not identify any likely significant effects in isolation. With the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and the Fetteresso Wind Farm Grid Connection and Access Corridor.	Using the information presently available on this project no likely significant effects have been identified in isolation and it is therefore accordingly concluded that there are no likely significant cumulative effects predicted from the Proposed Development and the Fetteresso Wind Farm Grid Connection and Access Corridor.
Network Rail Drumlithie	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**) The information available on this project does not identify any likely significant effects in isolation. With the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and Network Rail Drumlithie.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk during construction. The information available on this project does not identify any likely significant effects in isolation. With the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and Network Rail Drumlithie.	Using the information presently available on this project no likely significant effects have been identified in isolation and it is therefore accordingly concluded that no likely significant cumulative effects are predicted from the Proposed Development and Network Rail Drumlithie.
Glendye Wind Farm Grid Connection	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**) The information available on this project does not identify any likely significant effects in isolation. With the information available at	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk during construction. The information available on this project does not identify any likely significant effects in isolation. With the information available at present, no likely significant cumulative effects are predicted from the	Using the information presently available on this project no likely significant effects have been identified in isolation and it is therefore accordingly concluded that there are no likely significant cumulative effects predicted from the Proposed Development and the Glendye Wind Farm Grid Connection.

	Construction		Operation
	present, no likely significant cumulative effects are predicted from the Proposed Development and the Glendye Wind Farm Grid Connection.	Proposed Development and the Glendye Wind Farm Grid Connection.	
Craigneil Wind Farm Future Connection	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**) The information available on this project does not identify any likely significant effects in isolation. With the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and the Craigneil Wind Farm Future Connection.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk during construction. The information available on this project does not identify any likely significant effects in isolation. With the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and the Craigneil Wind Farm Future Connection.	Using the information presently available on this project no likely significant effects have been identified in isolation and it is therefore accordingly concluded that there are no likely significant cumulative effects predicted from the Proposed Development and the Craigneil Wind Farm Future Connection.
Fiddes 132 kV Grid Replacement	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**) The information available on this project does not identify any likely significant effects in isolation. With the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and the Fiddes 132 kV Grid Replacement.	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**) The information available on this project does not identify any likely significant effects in isolation. With the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and the Fiddes 132 kV Grid Replacement.	Using the information presently available on this project no likely significant effects have been identified in isolation and it is therefore accordingly concluded that there are no likely significant cumulative effects predicted from the Proposed Development and the Fiddes 132 kV Grid Replacement.
SSEN Transmission offshore grids project	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation** The information available on this project does not identify any likely significant effects in isolation. With the information available at present, no likely significant cumulative effects are predicted from the Proposed Development and the SSEN Transmission offshore grids project.	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**) The information available on this project does not identify any likely significant effects in isolation. With the information available at present, there are no likely significant cumulative effects predicted from the	Using the information presently available on this project no likely significant effects have been identified in isolation and it is therefore accordingly concluded that there are no likely significant cumulative effects predicted from the Proposed Development and the SSEN Transmission offshore grids project.

	Construction		Operation
		Proposed Development and the SSEN Transmission offshore grids project.	
Quithel BESS	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation** The information available on this project does not identify any likely significant effects in isolation. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Quithel BESS.	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**) The information available on this project does not identify any likely significant effects in isolation. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Quithel BESS.	Using the information presently available on this project no likely significant effects have been identified in isolation and it is therefore accordingly concluded that there are no likely significant cumulative effects predicted from the Proposed Development and the Quithel BESS.
Onshore Transmission Infrastructure for Bowdun Offshore Wind Farm	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation** The information available on this project does not identify any likely significant effects in isolation. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Onshore Transmission Infrastructure for Bowdun Offshore Wind Farm.	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**) The information available on this project does not identify any likely significant effects in isolation. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Onshore Transmission Infrastructure for Bowdun Offshore Wind Farm.	Using the information presently available on this project no likely significant effects have been identified in isolation and it is therefore accordingly concluded that there are no likely significant cumulative effects predicted from the Onshore Transmission Infrastructure for Bowdun Offshore Wind Farm.
Craigneil Wind Farm	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation** The information available on this project does not identify any likely significant effects in isolation. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Craigneil Wind Farm.	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**) The information available on this project does not identify any likely significant effects in isolation. With the information available at present, there are no likely	Using the information presently available on this project no likely significant effects have been identified in isolation and it is therefore accordingly concluded that there are no likely significant cumulative effects predicted from the Craigneil Wind Farm.

	Construction		Operation
		significant cumulative effects predicted from the Proposed Development and the Craigneil Wind Farm.	
Fithie Energy Park	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (**Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**). There is limited information available on the effects of the Fithie Energy Park upon hydrology and hydrogeology and as it will not be constructed at the same time as the Proposed Development, any significant cumulative effect is likely to be no greater than this other project in isolation. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Fithie Energy Park.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk during construction. There is limited information available on the effects of the Fithie Energy Park upon hydrology and hydrogeology and as it will not be constructed at the same time as the Proposed Development, any significant cumulative effect is likely to be no greater than this other project in isolation. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Fithie Energy Park.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk. Any significant cumulative effect of the Proposed Development with the Fithie Energy Park is therefore likely to be no greater than this other project in isolation. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Fithie Energy Park.
Balnuith BESS	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**). The FRA submitted in support of the planning application for the Balnuith BESS states in Chapter 5 that surface water management measures will be in place during the construction phase and that any temporary measures will need to be agreed with SEPA and Angus Council. Given that the Proposed Development is not predicted to have a significant effect upon surface water quality, it is accordingly concluded that any effect will be no greater than the effect of this other project in isolation. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Balnuith BESS.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk during construction. The FRA submitted for the Balnuith BESS does not specifically address flood risk in the construction phase and there is no information in the application documents to suggest when construction is due to start and hence whether its construction will coincide with the Proposed Development. However, given that the Proposed Development is not predicted to have a significant effect upon runoff rates and flood risk it is accordingly concluded that any effect will be no greater than the effect of this other project in isolation. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Balnuith BESS.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk. The FRA submitted in support of the planning application for the Balnuith BESS concludes that "*The Proposed Development is not predicted to increase surface water runoff or flooding to the surrounding catchment.*" With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Balnuith BESS.
Myreton BESS	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the	The Proposed Development (with this inter development) is not predicted to have a significant	The Proposed Development (with this inter development) is not predicted to

	Construction		Operation
	application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**). The screening request for the Myreton BESS concludes that the "*development will have extremely limited effects on hydrology*" and therefore with the limited information available it is accordingly concluded that there is no likely significant effect upon hydrology and hydrogeology. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Myreton BESS.	effect upon runoff rates and flood risk during the construction. The screening request for the Myreton BESS concludes that the "*development will have extremely limited effects on hydrology*" and therefore with the limited information available it is accordingly concluded that there is no likely significant effect upon hydrology and hydrogeology and there are no likely significant cumulative effects predicted from the Proposed Development and the Myreton BESS.	have a significant effect upon runoff rates and flood risk. The screening request for the Myreton BESS concludes that the "*development will have extremely limited effects on hydrology*" and therefore with the limited information available it is accordingly concluded that there is no likely significant effect upon hydrology and hydrogeology. There are no likely significant cumulative effects predicted from the Proposed Development and the Myreton BESS.
Glenbervie BESS	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**). There is limited information available on the effects of the Glenbervie BESS upon hydrology and hydrogeology and it is not known whether the project will be constructed at the same time as the Proposed Development. It is noted that the Glenbervie BESS site boundary overlaps with the existing, and proposed permanent access tracks leading to Tower S11 of the Proposed Development. The area of overlap of both projects is within the Killer Burn catchment. Assuming that best practice water management procedures are adopted for the construction of the BESS, then with the information available at this stage, it is concluded that any effect will be no greater than the effect of this other project in isolation and there are no likely significant cumulative effects predicted from the Proposed Development and the Glenbervie BESS.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk during the construction. There is limited information available on the effects of the Glenbervie BESS upon flood risk. SEPA future flood maps indicate a small area of surface water flooding along the margins of the Killer Burn. Assuming that best practice water management procedures, including the use of construction SuDS to attenuate surface water runoff are adopted for the construction of the BESS, then with the information available at this stage, it is concluded that any effect will be no greater than the effect of this other project in isolation and there are no likely significant cumulative effects predicted from the Proposed Development and the Glenbervie BESS.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk. With the information available at this stage, it is concluded that any effect will be no greater than the effect of this other project in isolation and there are no likely significant cumulative effects predicted from the Proposed Development and the Glenbervie BESS.
South Leylodge Farm BESS	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied**	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk. The Drainage Impact Assessment submitted for the South Leylodge Farm BESS states that it "*will not*	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk.

	Construction		Operation
	Mitigation and Table 13.22: Committed Additional Mitigation Construction). There is limited information available on the effects of the South Leylodge BESS upon hydrology and hydrogeology. The Project will share part of an existing access track to be used by the Proposed Development during constrcution and is ~150 m north of Tower N3. The South Leylodge Farm BESS and the infrastructure of the Proposed Developement drain via overland flow towards the Dewsford Burn, which is ~530 m away. There are no other sensitive receptors nearby. There is no information in the application documents to suggest when construction is due to start and hence whether its construction will coincide with the Proposed Development. Given the distance between the projects and the Dewsford Burn, any significant cumulative effect is likely to be no greater than this other project in isolation and there are no likely significant cumulative effects predicted from the Proposed Development and the South Leylodge Farm BESS.	*increase flood risk away from the Application Site during the construction, operation, and decommissioning phases*". It is therefore concluded that there are no likely significant cumulative effects predicted from the Proposed Development and the South Leylodge Farm BESS.	The Drainage Impact Assessment submitted for the South Leylodge Farm BESS states that it "*will not increase flood risk away from the Application Site during the construction, operation, and decommissioning phases*". It is therefore concluded that there are no likely significant cumulative effects predicted from the Proposed Development and the South Leylodge Farm BESS.
Kintore Substation BESS	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction)**. There is limited information available on the effects of the Kintore Substation BESS upon hydrology and hydrogeology. The Kintore Substation BESS drains into a tributary of the Dewsford Burn, the confluence being 230 m downstream of the BESS. Given the distance between the projects (~430 m) and distance to the Dewsford Burn, it is concluded that there are no likely significant cumulative effects predicted from the Proposed Development and the Kintore Substation BESS.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk. The Drainage Strategy Technical Note states that the Kintore Substation BESS is "*not located within an area at risk of surface water flooding*" Given that the Proposed Development is not predicted to have a significant effect upon runoff rates and flood risk it is accordingly concluded that any effect will be no greater than the effect of this other project in isolation and there are no likely significant cumulative effects predicted from the Proposed Development and the Kintore Substation BESS.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk. The Drainage Strategy Technical Note states that the Kintore Substation BESS is "*not located within an area at risk of surface water flooding*" It is concluded that there are no likely significant cumulative effects predicted from the Proposed Development and the Kintore Substation BESS.
Kintore Hydrogen Production Facility	The Proposed Development (with this inter development)s not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction)**.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk. The EIA for the Kintore Hydrogen Production Facitlity considers effects on flood risk before additional mitigation measures to be negligible, hence residual effects will be negligible.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk. The EIA for the Kintore Hydrogen Production Facitlity considers effects on flood risk before additional mitigation

	Construction		Operation
	The EIA for the Kintore Hydrogen Production Facitlity considers effects before additional mitigation measures to be negligible, hence residual effects will be negligible. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Kintore Hydrogen Production Facility	With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Kintore Hydrogen Production Facility	measures to be negligible, hence residual effects will be negligible. With the information available at present, there are no likely significant cumulative effects predicted from the Proposed Development and the Kintore Hydrogen Production Facility
Cossans Solar and BESS	The Proposed Development (with this inter development) is not predicted to have a significant effect on water quality, PWS, abstractions or GWDTE during the construction phase with the application of mitigation measures (See **Table 13.14: Applied Mitigation and Table 13.22: Committed Additional Mitigation Construction**). The FRA submitted in support of the planning application for the Cossans Solar and BESS states that with consideration of embedded mitigation measures in place during the construction phase that any adverse, short term effect is negligible and is considered not significant. Given that the Proposed Development is not predicted to have a significant effect upon surface water quality, it is concluded that any effect will be no greater than the effect of this other project in isolation and there are no likely significant cumulative effects predicted from the Proposed Development and the Cossans Solar and BESS.	The Proposed Development is not predicted to have a significant effect upon runoff rates and flood risk during construction. The FRA submitted for the Cossans Solar and BESS states that with consideration of embedded mitigation measures in place during the construction phase that any adverse, short term effect is negligible and is considered not significant. Given that the Proposed Development is not predicted to have a significant effect upon runoff rates and flood risk it is concluded that any effect will be no greater than the effect of this other project in isolation and there are no likely significant cumulative effects predicted from the Proposed Development and the Cossans Solar and BESS.	The Proposed Development (with this inter development) is not predicted to have a significant effect upon runoff rates and flood risk. The FRA submitted in support of the planning application for the Cossans Solar and BESS concludes that the development "*has the potential to increase surface water runoff. If not managed appropriately, this has the potential to impact on the local hydrology and flood risk within the Site. Provision of a permanent surface water drainage strategy shall provide appropriate attenuation and runoff control measures for operational runoff prior to discharge to the water environment*" Given that the Proposed Development is not predicted to have a significant effect upon runoff rates and flood risk, and with the permanent surface water drainage system for the Cossans Solar and Bess project, it is concluded that any effect will be no greater than the effect of this other project in isolation and there are no likely significant cumulative effects predicted from the Proposed Development and the Cossans Solar and BESS.

	Construction	Operation
Overall Inter Cumulative Effects Summary	The information available at present on the inter developments does not identify any likely significant effects in isolation and it is therefore accordingly concluded that there is no likely significant cumulative effect overall.	

13.10 Summary of Total Intra and Inter Cumulative Effects

13.10.1 The nature of the intra and inter cumulative developments are such that they are unlikely to have significant effects upon hydrology and hydrogeology and given the information that is available at this stage, it is unlikely that there will be significant cumulative effects during the construction or operation phases of the Proposed Development.

13.11 Summary of Significant Effects

13.11.1 **Table 13.26: Summary of Significant Effects** below summarises the predicted significant effects (ie **Moderate** or **Major**) of the Proposed Development on Hydrology, Hydrogeology and Peat prior to the application of additional mitigation. Only predicted significant effects prior to additional mitigation are presented in the table.

13.11.2 Prior to the application of additional mitigation, the effects during construction on Hydrology, Hydrogeology and Peat were mainly assessed to be **Minor** or **Negligible**, with the exception of those receptors presented in **Table 13.23: Summary of Assessment of Effects – Section A to F**.

13.11.3 With site-specific additional mitigation at locations where relevant buffers could not be achieved, the residual construction effects were assessed to be **Minor** or **Negligible**.

13.11.4 During operation, the effects were assessed to be **Negligible**. No additional mitigation during operation was required.

13.11.5 There are no likely significant cumulative effects during construction or operation on Hydrology, Hydrogeology and Peat.

13.11.6 There are no predicted residual adverse significant (**Moderate** or **Major**) effects on Hydrology, Hydrogeology and Peat.

Table 13.26: Summary of Significant Effects

Predicted Effects	Significance Prior to Additional Mitigation	Mitigation	Significance of Residual Effects Following Additional Mitigation
Construction			
Effect on water quality to downstream watercourses and receptors • Dean Water catchment, includes River Tay SAC; • River South Esk catchment, includes River South Esk SAC; • West Water catchment; • Bervie Water catchment; • Carron Water catchment; and • River Dee catchment (includes River Dee SAC and DWPA).	**Moderate**	Additional mitigation and SuDS (eg silt fences, settlement ponds) will be installed around locations where relevant buffers were not achieved during construction to reduce the risk of sediment/silt runoff to the water environment during construction. The buffer encroachment locations are shown in **Volume 3, Figure 13.2: Hydrology, Flood Risk and Buffers** and described in **Volume 5, Appendix 13.1: Watercourse Crossing and Buffers Assessment**.	**Negligible**
Effect on PWS quality and quantity: • Coldstream Spring 2; • Mains of Drumhendry; • Whins Farm; • Inches Cottage and Farm; • Cotbank; • Park Estate, Lochwood Cottage back- up well; • King's Well; • Stepsbrae Steading/ Backhill of Glack; • Wardes Farm and Cottage; and • Leylodge Schoolhouse.	**Moderate**	PWS mitigation is site specific and details are provided in the chapter and appendices. Additional surface water run-off control (eg SuDS, silt fences) (in some cases); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers, new PWS or new mains connection. Further investigation to establish whether King's Well is still in use will be undertaken before construction. This will inform appropriate mitigation.	**Minor to Negligible**

Predicted Effects	Significance Prior to Additional Mitigation	Mitigation	Significance of Residual Effects Following Additional Mitigation
		Cognisance of the PWS distribution networks before, and during construction.	
Effects on GWDTE: • GWDTE 1; and • GWDTE 8.	**Moderate**	Access track will be designed to enable subsurface flows to be maintained. Tower working area adapted to avoid GWDTE. Additional silt fences, silt traps and SuDS will be emplaced and utilised during construction. Monitoring before, during and after construction.	**Minor**