

Eastern Green Link 4: Scottish Onshore Scheme

Volume 2: Main Report

Chapter 8: Water Environment and Flood Risk

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08.

**Water
Environment
and Flood
Risk**

8. Water Environment and Flood Risk

8.1 Introduction

This chapter of the EIA Report identifies and assesses the potential impacts and effects of the Scottish Onshore Scheme on the water environment during construction and operation. For this assessment, the water environment includes:

- The water quality of surface water features, hydrology and fluvial hydromorphology of watercourses, and the geomorphology of lochs/ lochans;
- The quality, flows, and levels of groundwater features; and
- Flood risk and drainage.

This chapter is supported by the following figures (which can be found throughout this chapter) and appendices (which are provided in **Volume 4 Appendices**):

- **Figure 8.1 Surface Water Receptors;**
- **Figure 8.2 Groundwater Receptors;**
- **Figure 8.3a Present Day Flood Risk;**
- **Figure 8.3b Future Day Flood Risk;**
- **Figure 8.4 Private Water Supplies;**
- **Figure 8.5 Water Course Crossings;**
- **Appendix 8.1 PWS Risk Assessment;**
- **Appendix 8.2 WFD Screening and Scoping Assessment;**
- **Appendix 8.3 Flood Risk Assessment;**
- **Appendix 8.4 Watercourse Crossings; and**
- **Appendix 8.5 CAR Licenses.**

Where there are surface water or groundwater dependent ecosystems, these are considered in this assessment when determining the importance of water features, with the effects on the relevant habitats reported in **Chapter 7 Ecology and Nature Conservation**. Chapter 7 also considers any impacts on the flora and fauna associated with the freshwater aquatic environment, as well as ponds (which are considered as a specific habitat type rather than a water feature). In addition, **Chapter 12 Geology and Ground Conditions** considers the potential for impacts on geology, bedrock, peat and carbon.

Finally, although planning for the Scottish Onshore Scheme extends down to the Low Water Mark, this chapter does not assess marine water features and impacts, as the Marine Scheme is proposed to come ashore and connect with the Scottish Onshore Scheme above Mean High Water Spring Tide given the rocky foreshore at this location. Any pollution risk from

the release of fine sediment or chemical spillages from offshore works on coastal waters will be included in the Marine Scheme environmental appraisal.

8.2 Legislation and Policy

Legislation

Legislation, planning policy and guidance relevant to this assessment and pertinent to the Scottish Onshore Scheme is outlined in this section (please note that regulations transferring powers from the European Union to the United Kingdom authorities are not listed).

The following national legislation is relevant to the Scottish Onshore Scheme and will be considered as part of this assessment:

- Climate Change (Scotland) Act (2009) (Ref 8-2);
- Flood Risk Management (Scotland) Act (2009) (Ref 8-3);
- Nature Conservation (Scotland) Act (2004) (Ref 8-4);
- Water Environment Water Services ('the WEWS Act') (Scotland) Act (2003) (Ref 8-5);
- Town and Country Planning (Scotland) Act (1997) (Ref 8-6);
- Environmental Protection Act (1990) (as amended) and Part 2A The Contaminated Land Regime (2006) (Ref 8-7);
- Electricity Act (1989) (Ref 8-8);
- Reservoirs (Scotland) Act 2011 (Ref 8-103);
- The Reservoirs (Scotland) Regulations 2016 (Ref 8-113);
- Pollution Prevention and Control (Scotland) Regulations (2012) (PPC) (Ref 8-9);
- Construction (Design and Management) Regulations (2015) (Ref 8-10);
- Environmental Protection (Duty of Care) (Scotland) Regulations (2014) (Ref 8-11);
- Water Environment (Controlled Activities) (Scotland) Regulations (2011) (CAR) ('the CAR Regulations') (Ref 8-1);
- Environmental Liability (Scotland) Regulations (2009) (Ref 8-12);
- Private Water Supplies (Scotland) Regulations (2006) (Ref 8-104);
- Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations (2017) (Ref 8-105);
- Water Environment (DWPA) (Scotland) Order (2013) (Ref 8-100); and
- Contaminated Land (Scotland) Regulations (2005) (Ref 8-13).

National Planning Policy

The following provides a brief summary of relevant national planning policy.

National Planning Framework 4 (NPF 4)

The National Planning Framework 4 (NPF4) (Ref 8-14), published in February 2023, replaces the previous National Planning Framework 3 (NPF3) (Ref 8-15). NPF4 sets out the Scottish

Government’s spatial development principles, regional priorities, national developments and national planning policy, covering six spatial principles which aim to deliver sustainable places, liveable places and productive places. Policy 11 within NPF4 states that project design and mitigation should address any effects on hydrology, the water environment and flood risk. Policy 22 aims to strengthen resilience to flood risk by promoting avoidance as a first principle and reducing the vulnerability of existing and future development to flooding.

Planning Advice Notes and Specific Advice Sheets

Topic specific Planning Advice Notes (PANs) and Specific Advice Sheets set out detailed advice from the Scottish Government in relation to a number of planning issues. PANs and Specific Advice Sheets relevant to the Scottish Onshore Scheme are outlined in **Table 8-1 Planning Advice Notes and Specific Advice Sheets**.

Table 8-1 Planning Advice Notes and Specific Advice Sheets

Planning Advice Notes and Specific Advice Sheets	Key requirements relating to the water environment	Relevance to the Scottish Onshore Scheme and how addressed
Planning and waste management Advice (Ref 8-16)	States that there should be environmental protection considerations to mitigate any potential effects on the water environment.	Mitigation measures are aligned to the Advice and are outlined in Section 8.6 Embedded Mitigation and Section 8.7 Standard Mitigation of this chapter
PAN 79: Water and drainage (Ref 8-17)		
PAN 51: Planning, Environmental Protection and Regulation (Ref 8-18)		
PAN 61: Sustainable Urban Drainage Systems (Ref 8-19)	States that discharges of surface water run-off do not automatically require consent from SEPA. However, the Water Framework Directive will require that all discharges liable to cause pollution are subject to some form of prior approval.	No discharges are expected to cause significant pollution. However, mitigation measures for both the construction and operation phase are outlined in Section 8.7 Standard Mitigation and Section 8.60 Embedded Mitigation of this chapter.
Flood Risk: Planning Advice	States that planning authorities should have regard to the probability of flooding from all sources. It encourages avoidance of flood risk by not locating development in areas at risk of flooding. The Scottish Planning Policy states that where built development is permitted in medium to high flood risk areas, measures to protect against or manage flood risk will be required.	The majority of the Scottish Onshore Scheme falls within areas deemed to have low risk of flooding from all sources. Where baseline flood risk is high or there is potential for increased risk, appropriate mitigation measures outlined in Section 8.7 Standard Mitigation and Section 8.6 Embedded Mitigation have been embedded to ensure there is no increase in risk and the development remains sustainable.

Scotland’s Zero Waste Plan (2010) Scotland’s Zero Waste Plan (2010) (Ref 8-20)

The Scottish Government’s Zero Waste Plan (Ref 8-20) details the aim of increasing efficiency of resource use through reduction of demand on primary resources and increasing reuse, recycling and recovery of materials. This influences the decisions to be made in the development of the Scottish Onshore Scheme, with the latter to be favoured wherever reasonably possible at all stages in the construction and operation of the Scottish Onshore Scheme. Waste materials generated should be viewed as resources for use elsewhere. For example, soil removed as part of the earthworks of this project should be used for where soil is needed elsewhere instead of bringing in soil from another external source.

River Basin Management Plan

The River Basin Management Plan (RBMP) for Scotland 2021-2027(Ref 8-22) sets out a range of actions to address impacts to the water environment. The RBMP outlines actions for public bodies and land managers and are produced by the Scottish Environment Protection Agency (SEPA) on behalf of the Scottish Government. In summary, the RBMP provides the following:

- The conditions of the water environment;
- Pressures which could or are impacting the water environment; and
- Actions to address any impacts.

Local Planning Policy

The Fife Local Development Plan (Ref 8-23) (LDP) was formally adopted in September 2017 and provides the local planning policy for Fife. The relevant Policies to the Scottish Onshore Scheme are listed in **Table 8-2 Fife LDP Policies**. A new LDP called Fife's Place Plan is currently being prepared and is anticipated to be adopted in 2028.

Table 8-2 Fife LDP Policies

Policy Number	Description
Policy 12 – Flooding and the Water Environment	<i>“Development proposals will only be supported where they can demonstrate that they will not, individually or cumulatively increase flooding or flood risk from all sources (including surface water drainage measures) on the site or elsewhere; reduce the water conveyance and storage capacity of a functional flood plain; detrimentally impact on ecological quality of the water environment, including its natural characteristics, river engineering works, or recreational use; detrimentally impact on future options for flood management; require new defences against coastal erosion or coastal flooding; and increase coastal erosion on the site or elsewhere.”</i>
Policy 3 – Infrastructure and Services	<p><i>“Development proposals must incorporate measures to ensure that they will be served by adequate infrastructure and services including:</i></p> <p><i>foul and surface water drainage, including Sustainable Urban Drainage Systems (SUDS); and</i></p> <p><i>measures that implement the waste management hierarchy as defined in the Zero Waste Plan for Scotland including the provision of local recycling facilities”.</i></p> <p><i>“As a general rule, development with a drainage requirement will be expected to:</i></p> <p><i>use a public sewer connection; or</i></p>

Policy Number	Description
	<p><i>if a public sewer connection cannot be achieved at a reasonable cost, use a private waste water treatment plant which must prevent any flooding or pollution and which must be adequately maintained through a legal agreement which the developer must enter into to cover ownership and maintenance.</i></p> <p><i>Where private foul drainage arrangements are proposed that will discharge to the environment, SEPA will be required to be consulted on the acceptability of the proposals under the Water Environment (Controlled Activities) Regulations 2011 (as amended). If upgrades to the present waste water treatment works are needed this will be required before development can commence”.</i></p> <p><i>“Scottish Planning Policy expects development and infrastructure to be designed to be free from surface water flooding. This policy will be used to assess whether development proposals:</i></p> <p><i>accommodate the requirements of any drainage strategies of assessments carried out for the site;</i></p> <p><i>have sufficient space within the site to accommodate sustainable drainage; and</i></p> <p><i>include an appropriately designed sustainable drainage system. Making Fife’s Places Supplementary Guidance will provide guidance on the siting and requirements of SUDS proposals”.</i></p>
Policy 11 – Low Carbon Fife	<p><i>“Planning permission will only be granted for new development where it has been demonstrated that:</i></p> <p><i>Construction materials come from local or sustainable sources;</i></p> <p><i>Water conservation measures are in place; and</i></p> <p><i>Sustainable urban drainage measures will ensure that there will be no increase in the rate of surface water run off in peak conditions or detrimental impact on the ecological quality of the water environment”.</i></p>

8.3 Consultation

Table 8-3 Summary of Consultation lists the consultation that has taken place in preparing this assessment. The table lists results from the scoping opinion unless otherwise stated.

Table 8-3 Summary of Consultation

Consultee	Key issue	Summary of Response	Action Taken
Fife Council	Decom-missioning	<i>“I DO NOT concur with your Scoping Report’s conclusion that the Onshore EIA need not assess likely significant effects of decommissioning”.</i>	The risk from decommissioning with regards to potential impacts on the water environment is considered in Section 8.8 Assessment of Effects , including why significant effects are unlikely.
Fife Council	Scope of water environment assessment	Agree that the water environment and flood risk assessment can scope-out Camilla Loch, Loch Gelly, and two identified (but	No further action.

Consultee	Key issue	Summary of Response	Action Taken
		unnamed) lochs from the assessment on surface water features, on the basis that these are out with the project area.	
SEPA	Drainage and SUDS	<p>The Flood Risk Assessment (FRA) should consider climate change, align with national planning policy and comply with Fife Councils Design Criteria Guidance on Flooding and Surface Water Management Plan Requirements.</p> <p>The potential pollution of existing watercourses during the construction and operational phases should be considered in the EIA report.</p> <p>Run-off from any areas subject to particularly high pollution risk (e.g. yard areas, service bays, fuelling areas, pressure washing areas, oil or chemical storage, handling and delivery areas) should be minimised and directed to the foul sewer.</p>	<p>Future climate change is considered within the FRA presented in Appendix 8.3 Flood Risk Assessment (Volume 4 Appendices).</p> <p>Fife Council's Design Criteria Guidance on Flooding and Surface Water Management Plan Requirements (Ref 8-102) has been considered. Temporary and Permanent SuDS are included in the Scottish Onshore Scheme.</p> <p>Potential pollution of existing watercourses during construction and operational phases are assessed within this chapter and mitigation set out where necessary.</p>
SEPA	Drainage and SUDS	Run-off from any areas subject to particularly high pollution risk (e.g. yard areas, service bays, fuelling areas, pressure washing areas, oil or chemical storage, handling and delivery areas) should be minimised and directed to the foul sewer.	Drainage design mitigation is detailed within Section 8.6 and Section 8.7.0
Fife Council's Natural Heritage Specialist	Horizontal Directional Drilling (HDD)	<i>"The Section 7 Water Environment & Flood Risk notes Horizontal Direct Drilling (HDD) will be used for larger watercourses and sensitive habitats will be avoided/traversed with care (i.e. no HDD use in areas of potential confined aquifer; avoidance of GWDEs, guided by the ecology study). Mitigation measures to be included in the CEMP are outlined".</i>	The assessment of HDD on groundwater receptors is included in Section 8.8 Assessment of Effects and a groundwater dewatering strategy is summarised in Section 8.9 Additional Mitigation .
Nature-Scot	Scope of water environment assessment	The proposal is unlikely to have Significant Effects on the qualifying features of the following SSSIs that are close to the Converter Station and proposed	The potential for hydrological pathways to these receptors are investigated in Section

Consultee	Key issue	Summary of Response	Action Taken
		underground cable routes, assuming work will not cause any hydrological impacts to these sites: Loch Leven SSSI, Camilla Loch SSSI, Holl Meadows SSSI and Carriston Reservoir SSSI.	8.5 Baseline Environment to justify why no further assessment is required in this chapter.
SEPA	B9097 culvert representation	The culvert is represented within the national scale modelling. However, actual dimensions were not known therefore default dimensions have been used to represent the culvert which is in line with the default approach where culvert information is not known.	The possible impact of this culvert on fluvial flooding has been assessed in Appendix 8.4 Watercourse Crossings (Volume 4 Appendices) and is summarised in Section 8.5 Baseline Environment .

8.4 Methodology

Guidance and Standards

There is no specific formal guidance or standards to be applied to the methodology for the water environment impact assessment. The approach and criteria to determine the significance of potential effects follows good practice as used on numerous other assessments of similar infrastructure projects.

Good practice guidance on how to carry out a Water Framework Directive (WFD) assessment is provided in the SEPA Policy No. 19 - Groundwater Protection Policy for Scotland (2009) (Ref 8-24).

The Scottish Government has published the Sewers for Scotland Manual (4th Edition, Scottish Water 2018) (Ref 8-25) and Planning Advice Notes to provide national guidance on various topics (see National Planning Policy section above for more detail).

SEPA has also produced a number of guidance documents covering a range of environmental issues that are relevant to this impact assessment. Those documents relevant to the water environment are listed below:

- SEPA Interim Position Statement on Planning and Flooding (2009) (Ref 8-26).
- SEPA Engineering Activities in The Water Environment: Good Practice Guide – River Crossings (Second edition, 2010) (Ref 8-27).
- SEPA Guidance on Assessing the Impacts of Development on Groundwater Abstractions (2024) (Ref 8-30).SRef 8-28
- SEPA Technical Flood Risk Guidance for Stakeholders (Version 13, 2022) (Ref 8-29).

Ref 8-30 Study Area

The Scottish Onshore Scheme is located in southern Fife, eastern Scotland, and runs from the coastal town of Kinghorn to the north of Lochgelly, located inland for a length of approximately 16.2 km.

For the purpose of this impact assessment, a 1 km Study Area has been used within which water features that may be affected by the Scottish Onshore Scheme have been identified. For these water features, the baseline also considers downstream attributes beyond the 1 km Study Area as water quality impacts can sometimes propagate along watercourses and it is important to consider any new or different receptors along its course that might materially influence the importance grade attributed to the watercourse. The distance downstream is variable and reflects the nature of the risk, rate of conveyance, dilution and dispersion potential at any given time. In this case, we have adopted a distance of a few kilometres as a precautionary approach.

Consideration has also been given to any groundwater features or groundwater dependent ecological sites outside the 1 km Study Area up to 2 km from the Application Boundary if it is considered that they might be hydrogeologically linked.

Assessment Scope

As described in the introduction to this chapter, the assessment of potential effects on the water environment includes consideration of impacts on the water quality of surface water features, fluvial hydromorphology of watercourses, geomorphology of freshwater lochs/lochans, and quality, flows, and levels of groundwater features. Where there are water dependent ecosystems, these are also considered in this assessment when determining the importance of water features. This is summarised in **Table 8-4 Scope of Assessment**. Impacts on ecological receptors are assessed in **Chapter 7 Ecology and Nature Conservation**; impacts from contaminated land on surface or groundwater receptors is presented in **Chapter 12 Geology and Ground Conditions**.

Table 8-4 Scope of Assessment

Impact	Relevant Receptors	Development Phase
Groundwater quality	Strathclyde Aquifer	Construction
	Unnamed Extrusive Rocks (Dinantian) Aquifer	
	Unnamed Igneous Intrusion (Carboniferous to Permian) Aquifer	
	PWS01, PWS02	
Groundwater quality	Clackmannan Aquifer	Construction and Operation
	Superficial Aquifer	
Groundwater quantity	Clackmannan Aquifer	Construction
	Strathclyde Aquifer	
	Unnamed Extrusive Rocks (Dinantian) Aquifer	
	Unnamed Igneous Intrusion (Carboniferous to Permian) Aquifer	
	PWS01, PWS02	
	Superficial Aquifer	

Impact	Relevant Receptors	Development Phase
Surface water quality – Spillage risk	All surface water features that may be directly or indirectly impacted as identified later	Construction and Operation
Surface water quality – Surface water runoff	All surface water features that may be directly or indirectly impacted as identified later	Construction and Operation
Hydromorphology	All surface water features that may be directly or indirectly impacted as identified later	Construction and Operation
Flood Risk	B9097	Construction and Operation
	Access road to Clentrie Farm (NT 22735 91070)	Construction
	Access road to The Ha'House (NT 19528 97195)	Construction
	Flood plain	Construction
	Jawbanes Road (NT 26468 88899)	Construction
	Access road to Little Gleniston (NT 22002 92874)	Construction
	Minor road connecting the B925 and B9157 (NT 22895 90335)	Construction
	Agricultural land (Multiple Locations)	Construction

Baseline Data Collection

The following sources have been used to inform the baseline upon which the effects have been assessed:

- Online Ordnance Survey digital maps (Ref 8-31);
- Met Office website (Ref 8-32);
- SEPA website (Ref 8-33);
- SNH Standing Waters Database (Ref 8-34);
- Scotland's Aquaculture website (Ref 8-35);
- Scotland's Environment website (Ref 8-36);
- National River Flow Archives website (Ref 8-37);
- British Geological Society (BGS) website (Ref 8-38);
- NatureScot (Ref 8-39);
- Scotland's aquifers and groundwater bodies (Ref 8-40);
- UK Centre for Ecology and Hydrology (Ref 8-41);
- Scotland's Environment Map (Ref 8-42);

- SEPA National Flood Risk Assessment Map (Ref 8-43); and
- A Freedom of Information request was also sent to SEPA who was able to provide additional data for the Study Area covering (received on 30 May 2025):
 - Surface water and groundwater quality;
 - Surface water and groundwater discharges;
 - Known pollution events;
 - Surface water monitoring stations; and
 - Ecology surveys.
- PWS data from Fife Council was also requested and received on 28 May 2025.

Please refer to **Appendix 8.3 Flood Risk Assessment, Volume 4 Appendices** for further information on baseline sources for flood risk.

Assessment Methodology

The qualitative assessment of potential likely significant effects during the construction, operational and decommissioning phases of the Scottish Onshore Scheme has been based on a source-pathway-receptor approach. For an impact on the water environment to exist, the following is required:

- An impact source or cause of effect (such as a structure over a watercourse, the release of polluting chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or the loss or damage to all or part of a water feature, cuttings/excavations and associated dewatering activities capable of causing temporary or permanent changes to groundwater level or flow pattern and quality (as in the case of groundwater));
- A receptor that is sensitive to that impact (i.e. water features and the services they support) that could potentially be affected; and
- A pathway by which the two are linked (i.e. all three elements must be present before a potential impact linkage can be realised).

The first stage in applying the source-pathway-receptor approach is to identify the causes or sources of potential impact from a development. The sources have been identified through a review of the details of the Scottish Onshore Scheme, including its size and nature, potential construction methodologies and timescales etc.

The next step in the approach is to undertake a review of the potential receptors; that is, the water environment receptors themselves that have the potential to be affected. Water features, including their attributes, have been identified through desk study and site surveys as described later.

The last stage of the approach is to determine if there is a viable exposure pathway or a 'mechanism' linking the source to the receptor. This is determined in the context of local conditions relative to water receptors within the Application Boundary and surrounding environments, such as topography, geology, climatic conditions, land use and the nature of

the impact (e.g. the mobility of a liquid pollutant or the proximity to works that may physically impact a water feature or be a source of water pollution).

Determining Magnitude of Impact and Importance of Receptors

The assessment of effect significance outlined within the below sections is consistent with the terminology and criteria outlined within **Chapter 5 Environmental Impact Assessment Methodology** of this EIA Report.

The Importance of receptors, or importance of the potentially affected water environment features has been established on the basis of a four-point scale, using the criteria presented in **Table 8-5 Receptor Importance descriptors** which has been modified from Design Manual for Roads and Bridges (DMRB) LA 113 Road Drainage and the Water Environment (Ref 8-97) to include hydromorphology.

The Importance of receptors, or importance of the potentially affected soils features has been established on the basis of a five-point scale, using the criteria presented in **Table 8-5 Receptor Importance descriptors** which has been modified from DMRB LA 113 Road Drainage and the Water Environment (Ref 8-97).

The magnitude of adverse or beneficial impacts has been determined by the seven-point scale presented in **Table 8-6 Magnitude of Impact**.

The significance of effects has been determined using the matrix presented in **Table 8-7 Matrix for assessment of Significance**. The assessment has considered the magnitude of impacts and the Importance of the resources/ receptors that could be affected in order to classify the effect. After using the matrix to determine the effect, professional judgement will be used to determine the residual significance.

Table 8-5 Receptor Importance descriptors (Ref 8-97)

Importance	Groundwater	Surface Water	Hydromorphology	Flood Risk
Very High - Nationally significant attribute of High Importance	Aquifer providing a regionally important resource and/ or supporting a site protected under International and UK legislation Ecology and Nature Conservation. Groundwater locally supports GWDTE.	Water feature having a WFD classification shown in a RBMP. Watercourse with a Q95 ≥ 1.0 m ³ /s. Site protected/ designated under International or UK legislation (SAC, SPA, SSSI, Ramsar site, Drinking Water Protection Zone (DrWPZ), or designating bathing/shellfish water. Major salmonid/ cyprinid fishery of national /international importance. Species protected at an international level.	Unmodified, near to or pristine conditions, with well-developed and diverse geomorphic forms and processes characteristic of river and loch type.	Essential Infrastructure or Most vulnerable development.

Importance	Groundwater	Surface Water	Hydromorphology	Flood Risk
High - Locally significant attribute of High Importance	Aquifer providing locally important resource or supporting river ecosystem and/ or supporting sensitive habitats of national importance. Groundwater supports a GWDTE.	Water feature having a WFD classification shown in a RBMP. Watercourse with a Q95 $m^3/s < 1.0 m^3/s$. Major Cyprinid Fishery at a local level. Species protected under UK legislation.	Conforms closely to natural, unaltered state and will often exhibit well-developed and diverse geomorphic forms and processes characteristic of river and loch type. Deviates from natural conditions due to direct and/ or indirect channel, flood plain, bank modifications and/ or catchment development pressures. Typology may be sensitive to morphological change (e.g. Plane-riffle, wandering and braided). Diverse range of fluvial processes that would be highly vulnerable to change as a result of modification.	Highly vulnerable development.
Medium – Feature of moderate quality and rarity	Aquifer providing water for agricultural or industrial use with limited connection to surface water. Groundwater of limited value because its quality does not allow potable or other quality sensitive uses.	Water feature not having a WFD classification shown in a RBMP and watercourse with Q95 $< 1.0 m^3/s$ to $> 0.001 m^3/s$.	Shows signs of previous alteration and/ or minor flow/ water level regulation but still retains some natural features or may be recovering towards conditions indicative of the higher category.	Least vulnerable development.
Low – Feature of lower quality	Unproductive Strata	Water feature not having a WFD classification shown in a RBMP and Q95 $\leq 0.001 m^3/s$.	Substantially modified by past land use, previous engineering works or flow/ water level regulation. Watercourses likely to possess an artificial cross-section (e.g. trapezoidal) and will probably be deficient in bedforms and bankside vegetation; also realigned or channelised with hard bank protection, or culverted and enclosed.	Water compatible development.

The magnitude of adverse or beneficial impacts has been determined by the eight-point scale presented in **Table 8-6 Magnitude of Impact** taking DMRB LA 113 Road Drainage and the Water Environment (Ref 8-97) and DMRB LA104 Environmental Assessment Table (Ref 8-98) into account. DMRB LA104 Environmental Assessment and monitoring (Ref 8-98) has been used for the significance criteria.

Table 8-6 Magnitude of Impact

Magnitude	Criteria
Major Adverse	Results in a loss of attribute and/ or quality and integrity of the attribute.
Moderate Adverse	Results in impact on integrity of attribute, or loss of part of attribute.
Minor Adverse	Results in some measurable change in attribute's quality or vulnerability.
Negligible	Results in impact on attribute, but of insufficient magnitude to affect the use or integrity.
Minor Beneficial	Results in some beneficial impact on attribute or a reduced risk of negative impact occurring.
Moderate Beneficial	Results in moderate improvement of attribute quality.
Major Beneficial	Results in major improvement of attribute quality.
No Change	No change to the quality of the attribute

All impacts are also described as either long-term/short-term, temporary/permanent, direct/indirect and certain/uncertain. These descriptors are defined below.

- Long-term/Medium-term/Short-term: describes length of time an impact is likely to last for. For this assessment, water quality impacts that are short term tend to occur over hours, days and maybe weeks. Beyond that impacts that occur over a number of years are considered medium term. Long term are impacts that occur for longer such as 10 years or more.
- Temporary/permanent: describes whether an impact lasts or remains indefinitely.
- Direct/indirect: describes whether a receptor is impacted directly, or indirectly via another pathway or mechanism as a consequence of the Scottish Onshore Scheme.
- Certain/Uncertain: describes the certainty of the impact predicted.

Significance of Effect

The significance of effects has been determined using the matrix presented in **Table 8-7 Matrix for assessment of Significance** which is based broadly on criteria first presented in DMRB LA104 Environmental assessment and monitoring (Ref 8-98).

The assessment has considered the magnitude of impacts and the importance of the resources / receptors that could be affected in order to classify the effect. Effects classed as moderate or greater are considered 'Significant' in planning terms (i.e. the shaded cells in **Table 8-7 Matrix for assessment of Significance**).

Table 8-7 Matrix for assessment of Significance

Magnitude	Very High	High	Medium	Low
Major	Very large	Large or very large	Moderate or large	Slight or moderate
Moderate	Large or very large	Moderate or large	Moderate	Slight
Minor	Moderate or large	Slight or Moderate	Slight	Neutral or slight
Negligible	Slight	Slight	Neutral or slight	Neutral
No change	Neutral	Neutral	Neutral	Neutral

Water Framework Directive Assessment

The WFD is implemented in Scotland through the Water Environment and Water Services (Scotland) Act 2003 (WEWS Act) (Ref 8-5). A WFD Screening and Scoping Assessment (**Volume 5 Appendix 10.2 WFD Screening and Scoping Assessment**) has been produced to assess the compliance of the Scottish Onshore Scheme with the WFD. It is based on a combination of a desk study and hydromorphological walkover and considers whether the Scottish Onshore Scheme has the potential to:

- Cause deterioration in ecological status or potential of relevant WFD designated water bodies;
- Prevent WFD designated water bodies from meeting their objective of ‘Good’ ecological status/ potential; and
- Prevent or compromise WFD objectives being met in other WFD designated water bodies or water dependent Protected Areas downstream of the site (i.e. indirect impacts).

The WFD screening and scoping assessment is qualitative and is based on the same source-pathway-receptor approach described earlier. However, the objective of the assessment is to see whether there is compliance with the above objectives rather than a significance of effect.

In undertaking the assessment, consideration has been given to the conservation objectives for any ecologically sensitive sites, where these might be more stringent.

The WFD screening and scoping assessment is presented in **Appendix 8.2 WFD Screening and Scoping Assessment, Volume 4 Appendices**. The WFD Assessment covers all the freshwater bodies which could be impacted by the Scottish Onshore Scheme. This includes Tiel Burn, Dronachy Burn, Den Burn and the River Ore. The WFD Assessment also considers the groundwater bodies which could be impacted by the Scottish Onshore Scheme, including Burntisland, Dunfermline and Kirkcaldy.

Private Water Supply Assessment

A PWS survey and assessment was carried out and can be viewed in **Appendix 8.1 PWS Risk Assessment, Volume 4 Appendices**. This assessment has two phases:

- **Phase 1 Information Gathering:** PWS locations and information was gathered from Fife Council (received 28 May 2025) and from a letter drop to the Piteadie property (on

03 July 2025). Another PWS was also identified during the site walkover on the 03 of July 2025.

- **Phase 2 Risk Assessment:** A risk assessment was carried out by using a source-pathway-receptor approach. The ‘Guidance on Assessing the Impacts of Development on Groundwater Abstractions (Ref 8-30)’ was used to inform the approach to the risk assessment. However, the guidance is limited to only groundwater abstractions. Therefore, for surface water abstractions a general source-pathway-receptor approach is used.

The guidance from SEPA suggests a matrix approach to determine the level of impact and then effect. However, although the guidance provides a framework for how effect can be determined, it does not state any criteria for the levels of impact. The overall method to determine the significance of effect outlined in the guidance document is similar to the approach to determine the significance of effect outlined within this chapter (See **Section 8.4 Methodology**). Though where the SEPA methodology classifies the magnitude of impact into the categories Substantial, Moderate, Slight and Negligible, the methodology employed here uses the categories of Major, Moderate, Minor and Low with the resulting Significance categories of Very Large, Large, Moderate, Slight and Neutral. This allows greater distinction and clarity between these magnitudes and significances and provides a more precautionary and considered outcome. **Appendix 8.1 PWS Risk Assessment, Volume 4 Appendices** therefore looks at the potential risks to PWS rather than impact and effect, with this aspect of the assessment carried out within this chapter using the criteria as defined earlier. The magnitude of impact (classed as negligible, minor, moderate or major adverse / beneficial) is determined based on the criteria listed in **Table 8-5 Receptor Importance descriptors** and the assessor’s professional judgement in relation to the risk involved.

The guidance also recommends a ‘moderate’ importance value for any and all drinking water PWS. However, for this assessment it is suggested that a High Importance is granted for all PWS. The High Importance value is given to these PWS as they are a direct human receptor and is considered more precautionary.

The PWS assessment presented in **Appendix 8.1 PWS Risk Assessment, Volume 4 Appendices** also outlines recommendations for mitigation, monitoring and a Private Water Supply Response Plan, details of which are only summarised in this chapter.

Limitations and Assumptions

The EIA process enables informed decision-making based on the best possible information about the environmental implications of a development being made available. However, it is common for there to be some uncertainty as to the exact scale and nature of the environmental impacts predicted. Where there is uncertainty of design, reasonable worst-case assumptions have been made. Where this applies to the magnitude of impact and overall effect, additional mitigation may be proposed to ensure confidence in a non-significant outcome.

The assessment is based on data available from online sources and a site walkover. For many water features in the Study Area there was no long-term water quality or hydrological data, and for others the data that was available was limited or obtained some time ago (and thus may not be wholly representative of current conditions). Therefore, the potential effects from

the Scottish Onshore Scheme on water quality, hydrology and hydrogeology has been assessed qualitatively and based on background information and certain assumptions defined in the impact assessment section. Given the nature of the Scottish Onshore Scheme this is considered to be acceptable.

With regards to the walkover survey, as this was carried out in July, there was dense vegetation growth on the banks which obscured the channel in many places. Therefore, it was not possible to fully assess the conditions of these channels due to a lack of visibility. In addition, seasonally dry and ephemeral watercourses may not have been identified in the field. However, by their very nature their importance will be low and thus significant effects are unlikely. The PWS Risk Assessment (**Appendix 8.1 PWS Risk Assessment, Volume 4 Appendices**) was carried out in July 2025 and so it can only be used to represent the PWS that were recorded at that time. PWS were identified based on current information and from communication with landowners during the walkover survey. It is possible that other unknown PWS exist, however we do not expect any new ones, and pre-construction activities will include a baseline review.

The source of the PWS at Broadleys Bagpipes and Reeds (PWS02) was not visited due to farm works in the field, although a grid reference for the PWS source was provided by the owner. The owner of this supply is currently in the process of gaining a mains supply, but the date of completion and whether or not a full transition to this supply will occur is not yet known. As PWS-02 is therefore still in use for an unknown period of time, it has been included in the assessment. If the supply remains in use, an additional visit to this PWS is recommended post planning decision to confirm the location and inspect the site as part of the approach to mitigation, and this is discussed further in **Section 8.9 Additional Mitigation**.

Any borehole data from the British Geological Survey (BGS) (Ref 8-101) sources are included on the basis that *“the British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation”*.

There was limited data on the groundwater quality on BGS (Ref 8-101) for all identified aquifers, and no groundwater quality data received from SEPA within the study area.

Ref 8-101 Where culverts and single span bridges are proposed for any haul road watercourse crossings, it has been assumed that there will be no loss of capacity compared to the existing channels. This aligns with the statements made within the underground DC cable route detailed in **Appendix 8.3 Flood Risk Assessment, Volume 4 Appendices**.

This chapter should be read in light of the legislation, statutory requirements and /or industry good practice applicable at the time of the assessment being undertaken. Any subsequent changes in this legislation, guidance or design may necessitate the findings to be reassessed in light of these circumstances. Further details and specific design information, including dimensions of infrastructure units and works, are given in **Section 8.6 A baseline** review of flood risk receptors (people, property, infrastructure or land) potentially affected by the described all sources of flood risk relative to the study area was undertaken for this assessment. These receptors are identified in **Table 8-23 Flooding Baseline Receptor and Importance**

Table 8-23 Flooding Baseline Receptor and Importance

Flood Source	Approx. NGR	Receptor potentially affected	Receptor importance
Fluvial, surface water	NT 19852 97647	B9097	Medium
Fluvial	NT 22735 91070	Access road to Clentrie Farm	Medium
Fluvial	NT 19528 97195	Access road to The Ha'House	Medium
Fluvial	NT 22002 92874	Access road to Little Gleniston	High
Fluvial	NT 22895 90335	Minor road connecting the B925 and B9157	Medium
Fluvial	NT 26468 88899	Jawbanes Road	Medium
Fluvial	NT 23259 90461	Flood plain	High
Fluvial, surface water, groundwater	Multiple locations	Agricultural land	Medium

Embedded Mitigation.

8.5 Baseline Environment

Study Area Topography, Land Use and Climate

The topography of the study area ranges from around 150 m Above Ordnance Datum (AOD) to sea level. Areas of highest elevation are located to the northern end of the Scottish Onshore Scheme and around Camilla Loch. In general, the topography gradually lowers towards the southern end to sea level around Kinghorn where the Firth of Forth SSSI is located.

The study area is characterised by agricultural and some industrial land uses along the south Fife coastline, punctuated by some small to medium towns and crossed by the A92 dual carriageway. The land use is predominantly agriculture with small areas of woodland, waterways and commercial windfarms, with some disused coal mining areas in the region (Ref 8-31).

The days of rainfall above 1 mm is also recorded by the Met Office. Leuchars Station located approximately 35.5 km northeast of the Scottish Onshore Scheme is the closest station with historical data. **Chart 8-1 Average Rainfall and Days of Rainfall above 1 mm sourced from Leuchars Monitoring Station (1991-2020)** shows the rainfall data from Leuchars Station in 2024. March and April have the highest rainfall amounts recorded, and September and June have the lowest.

Rainfall data provided by SEPA through the Kinghorn Ecology Centre Rain Gauge shows that over the last ten years, an annual average rainfall of 755 mm was recorded for this area (Ref 8-47). This is below the national UK average and indicates a drier climate which may aid in reducing risks of pollution and contamination during construction. No catchment data from the National River Flow Archive (NFRA) is available for this study as there are no NRFA gauging stations located within the study area.

Chart 8-1 shows the average rainfall data obtained from Leuchars Monitoring Station, the nearest Met Office (Ref 8-32) weather station with relevant data for this project. The average rainfall data per month for this period is displayed alongside the number of days in each

month in which the average rainfall exceeded 1 mm. October is the month with the highest average rainfall (approx. 80 mm) whilst November has the highest number of days with over 1 mm rainfall (12.27 days). The lowest average rainfall and the fewest days with over 1 mm rainfall are both recorded for April (approx. 44 mm and 8 days respectively).

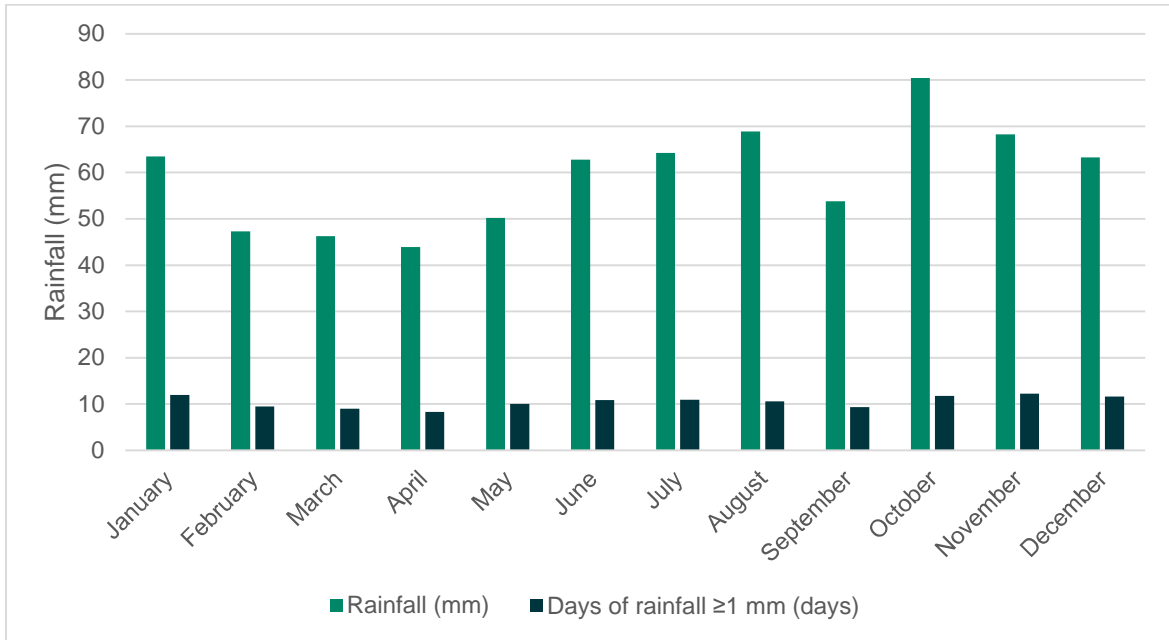


Chart 8-1 Average Rainfall and Days of Rainfall above 1 mm sourced from Leuchars Monitoring Station (1991-2020)

Geology and Soils

The assessment on geology and soils can be found within **Chapter 12 Geology and Ground Conditions**. This section aims to inform the hydrogeological understanding of the study area for the assessment of potential impacts on groundwater quality, levels and flows. Please refer to **Figure 12.1 Superficial Geology** and **Figure 12.2 Bedrock Geology** throughout.

Soils

The National Soil Map of Scotland shows that there are two main soil types within the study area (Ref 8-38). These comprise of mineral gleys with noncalcareous gleys (ID:445), and brown soils (ID:147). Both soil types are spread relatively evenly across the study area, with the mineral Gleys associated with carboniferous sandstones and the brown soils associated with basaltic lithologies.

Superficial Geology

The majority of the study area is underlain by superficial deposits. There are only a few small areas within the study area where bedrock is near or at the surface. **Table 8-8 Superficial Deposits** lists the superficial deposits found within the study area.

Table 8-8 Superficial Deposits

Geological Age	Geological Formation	Description
Quaternary	Peat	Found in small patches throughout the study area but may underly the Scottish Onshore Scheme in

Geological Age	Geological Formation	Description
		small sections in the north. Mainly a blanket accumulation of wet, acidic, partially decomposed vegetation.
Quaternary	Lacustrine Deposits	Clastic deposits formed from coarse grained bedload and fine-grained material. Found underlying the Scottish Onshore Scheme at NGR NT 26970 88462.
Quaternary	Alluvium – Clay, Silt, Sand and Gravel	Unconsolidated detrital material consisting of clay, silt, sand and gravel. Larger areas associated with Tiel Burn, Loch Gelly and the River Ore but smaller areas found throughout the middle of the study area.
Quaternary (Pleistocene)	Glaciofluvial Ice Contact Deposits- Gravel, Sand and Silt.	Stratified sand, gravel and interbedded diamicton. Locally with lenses of silt, clay and organic material. Found within the study area at NGR NT 21458 92788.
Quaternary (Devensian)	Till, Devensian - Diamicton	Consists of unsorted and unstratified drift with a wide range of clast sizes. Underlies the majority of the study area.

Bedrock Geology

There are no major faults within the study area. A fault at rockhead is recorded at Kinghorn, 564 m from the nearest works (underground DC cable route). Other linear features include inferred coal seams and inferred faults with an unknown displacement. The vast majority of the inferred coal seams are located in the centre of the study area around Loch Gelly and the A92. The majority of the inferred faults are located in the southwest of the study area. However, both the inferred coal seams and faults can be found sporadically throughout the study area with some underlying the Scottish Onshore Scheme.

The Scottish Onshore Scheme is separated into two geological periods; the Carboniferous and Permian. All lithologies are within the Carboniferous period apart from the two different igneous intrusions which range from the Carboniferous to the Permian period. **Table 8-9 Geological History** outlines these units in geological order.

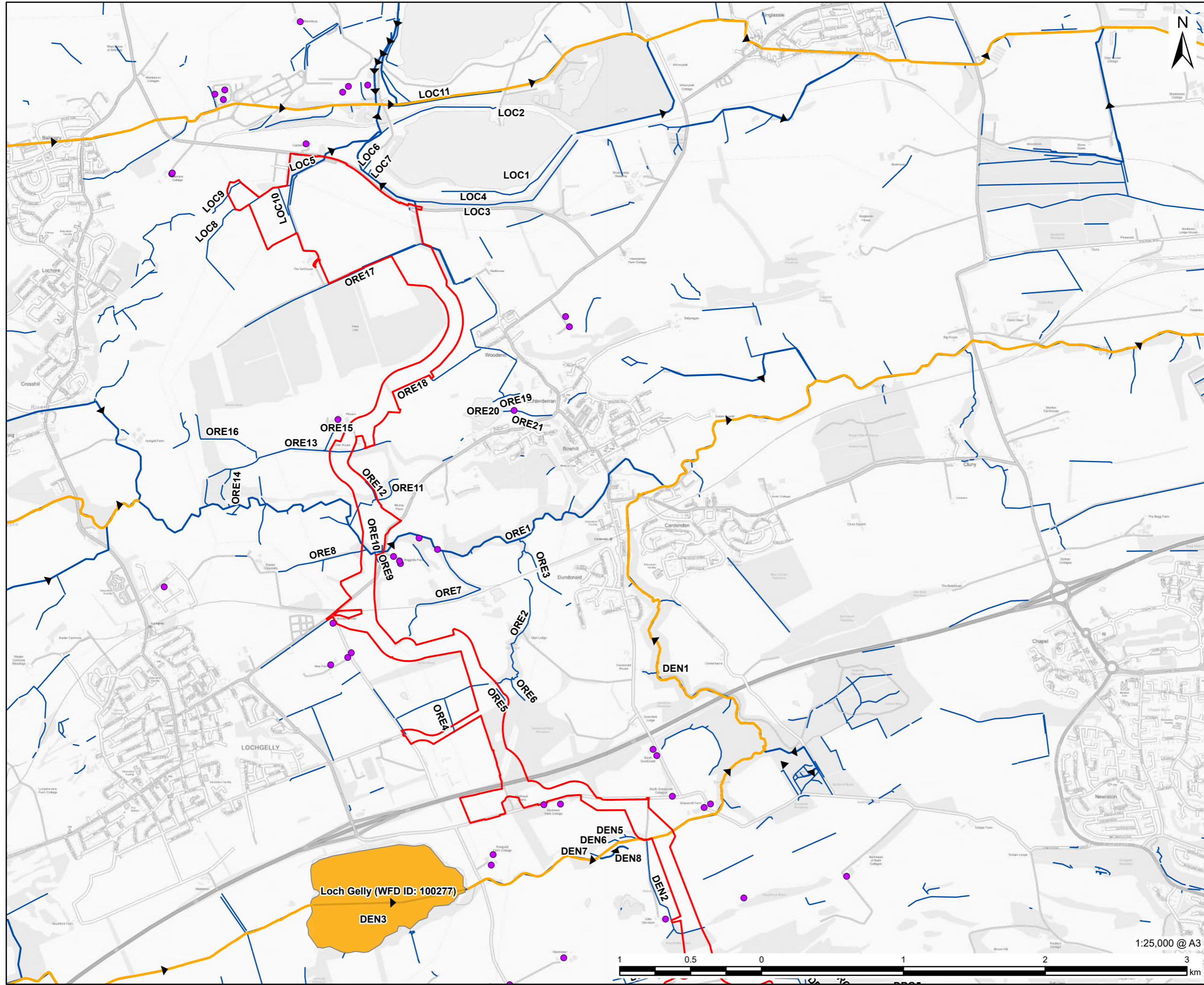
Table 8-9 Geological History

Geological Age	Geological Formation	Description	Hydrogeological Significance (Ref 8-50)
Carboniferous - Permian	Hawkgrraig Point Sill (Unnamed Igneous Intrusion, Carboniferous to Permian – Mafic Igneous Rock Aquifer)	Located in the centre of the study area and in the north, as well as a small section near the A92 to the west of the study area. Sills of Lothian and Fife, Microgabbro in the southern sections, in the northern section Sill and analcime-microgabbro with olivine.	Generally, a low productivity aquifer with groundwater in the upper weathered zone. Interbedded sedimentary beds which have the potential to hold groundwater. These interbeds will likely be confined/semi-confined conditions.

Geological Age	Geological Formation	Description	Hydrogeological Significance (Ref 8-50)
Carboniferous - Permian	Dinantian to Westphalian Sills (Unnamed Igneous Intrusion, Carboniferous to Permian – Dolerite and Tholeiitic Basalt Aquifer)	Located in the centre of the study area near Auchtertool. Edge of lithology may underly some of the Scottish Onshore Scheme between Clentrie Farm and Gelly Burn. Consists of Dolerite and Tholeiitic Basalt. Felsic rock may also be present.	Generally, a low productivity aquifer with groundwater in the upper weathered zone.
Carboniferous	Kinghorn Volcanic Formation – Basaltic Tuff and Laval (Unnamed Extrusive Rocks, Dinantian - Mafic Lava and Mafic Tuff Aquifer)	Located in the south and southeast of the study area, centred around Kinghorn. Underlies the Scottish Onshore Scheme in the south of the study area. Basaltic tuff and basaltic lava.	Generally, a low productivity aquifer with groundwater in the upper weathered zone. Interbedded sedimentary beds which have the potential to hold groundwater. These interbeds will likely be confined/semi-confined conditions.
Carboniferous	Lower Limestone Formation Blackhall Formation Limestone Coal Formation Upper Limestone Formation Passage Formation Castlecary Limestone (Clackmannan Group - Sedimentary Rock Cycles Aquifer)	Underlies the majority of the southwest, centre and north of the study area. Lower limestone and limestone coal. Characterised by units of limestone, mudstone, siltstone and sandstone which is capped by coal and seatearth. Strongly cyclical.	Highly productive aquifer (not extensive). Confined aquifers unlikely as potentially confining coal layers have been extensively mined and created more pathways for groundwater.
Carboniferous	Sandy Craig Formation (also interbedded within the Unnamed Extrusive Rocks) Pathhead Formation (also interbedded within the Unnamed Extrusive Rocks) St Monans White Limestone(also interbedded within the Unnamed Extrusive Rocks) (Strathclyde Formation - Sedimentary Rock Cycles Aquifer)	Mudstones and siltstones. Beds of dolomite and limestone present. Sandstones and argillaceous rocks. Cyclic with common marine bands. Located in the centre of the study area near Auchtertool.	Highly productive aquifer (not extensive). Potential confined aquifers within sandstones and limestones surrounded by clays and mudstones. Limited borehole data available.

Hydrogeology

There are five aquifers shown on the Hydrogeology 625K Scale Map of the UK (Ref 8-50) belonging to: The Unnamed Extrusive Rocks (Dinantian), Unnamed Igneous Intrusion (Carboniferous to Permian), Strathclyde Group, and the Clackmannan Group lithologies (See **Figure 8.2 Groundwater Receptors** and **Figure 8.4 Private Water Supplies**).

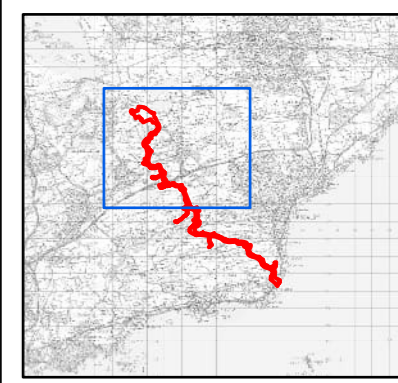


PROJECT
Eastern Green Link 4

CLIENT
SP Energy Networks

CONSULTANT
AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

- LEGEND**
- Planning Application Boundary
 - CAR License Location
 - Watercourse
 - Waterbody
 - ▶ Flow Direction
 - Special Protected Area (SPA)
 - Site of Special Scientific Interest (SSSI)
- WFD Waterbody Status**
- Good
 - Moderate
 - Poor
- WFD Watercourse Status**
- Poor



NOTES

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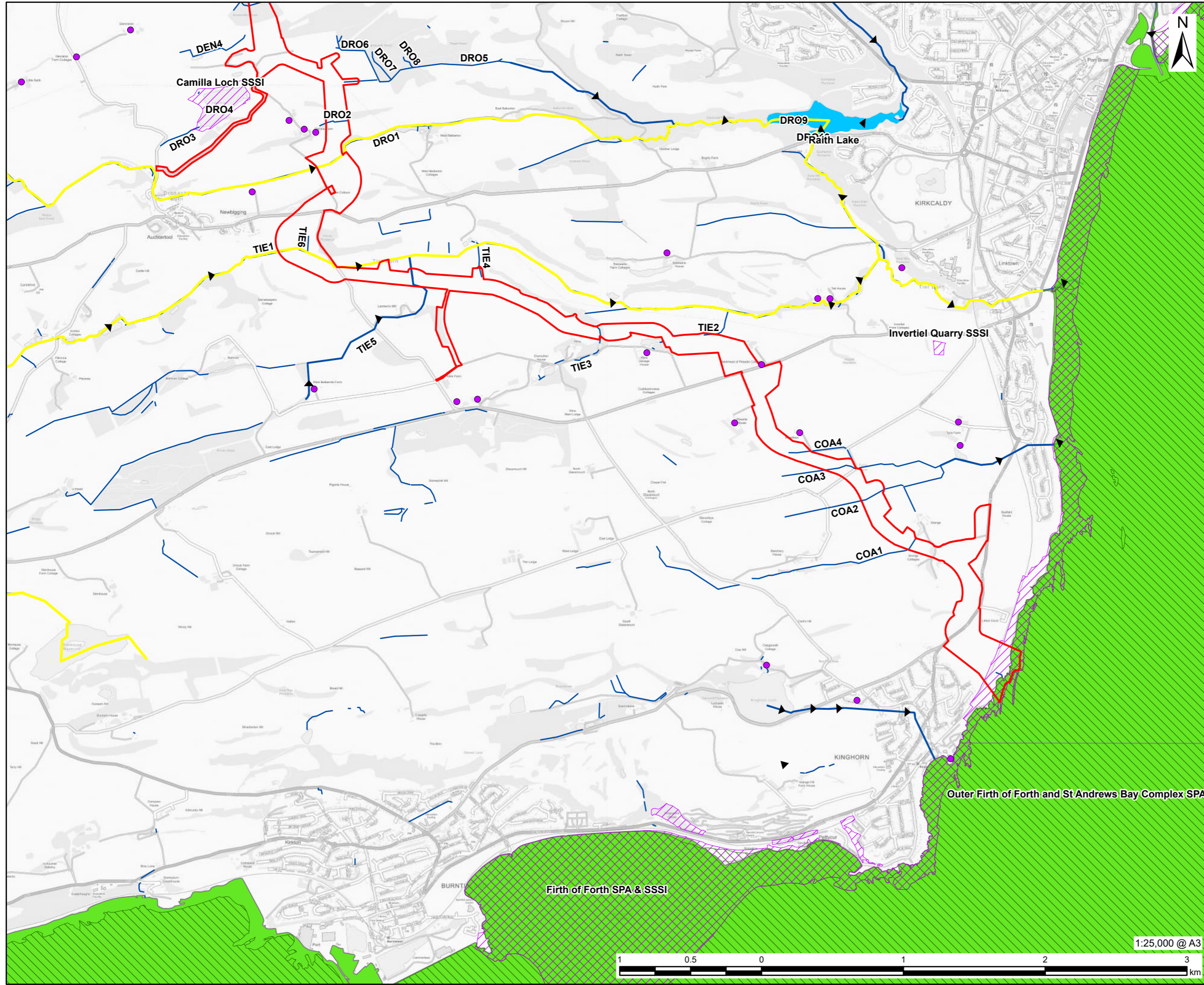
ISSUE PURPOSE
EIA REPORT

PROJECT NUMBER
60707131

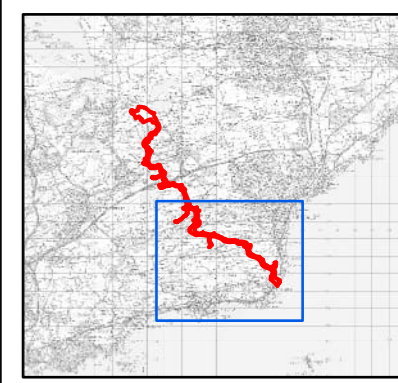
FIGURE TITLE
Surface Water Receptors

FIGURE NUMBER
Figure 8.1 (Sheet 1 of 2)

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- Planning Application Boundary
 - CAR License Location
 - Watercourse
 - Waterbody
 - ▶ Flow Direction
 - Special Protected Area (SPA)
 - Site of Special Scientific Interest (SSSI)
- WFD Waterbody Status
- Good
 - Moderate
 - Poor
- WFD Watercourse Status
- Moderate



NOTES

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EIA REPORT

PROJECT NUMBER

60707131

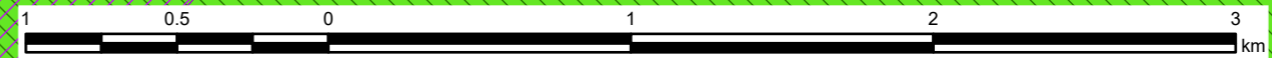
FIGURE TITLE

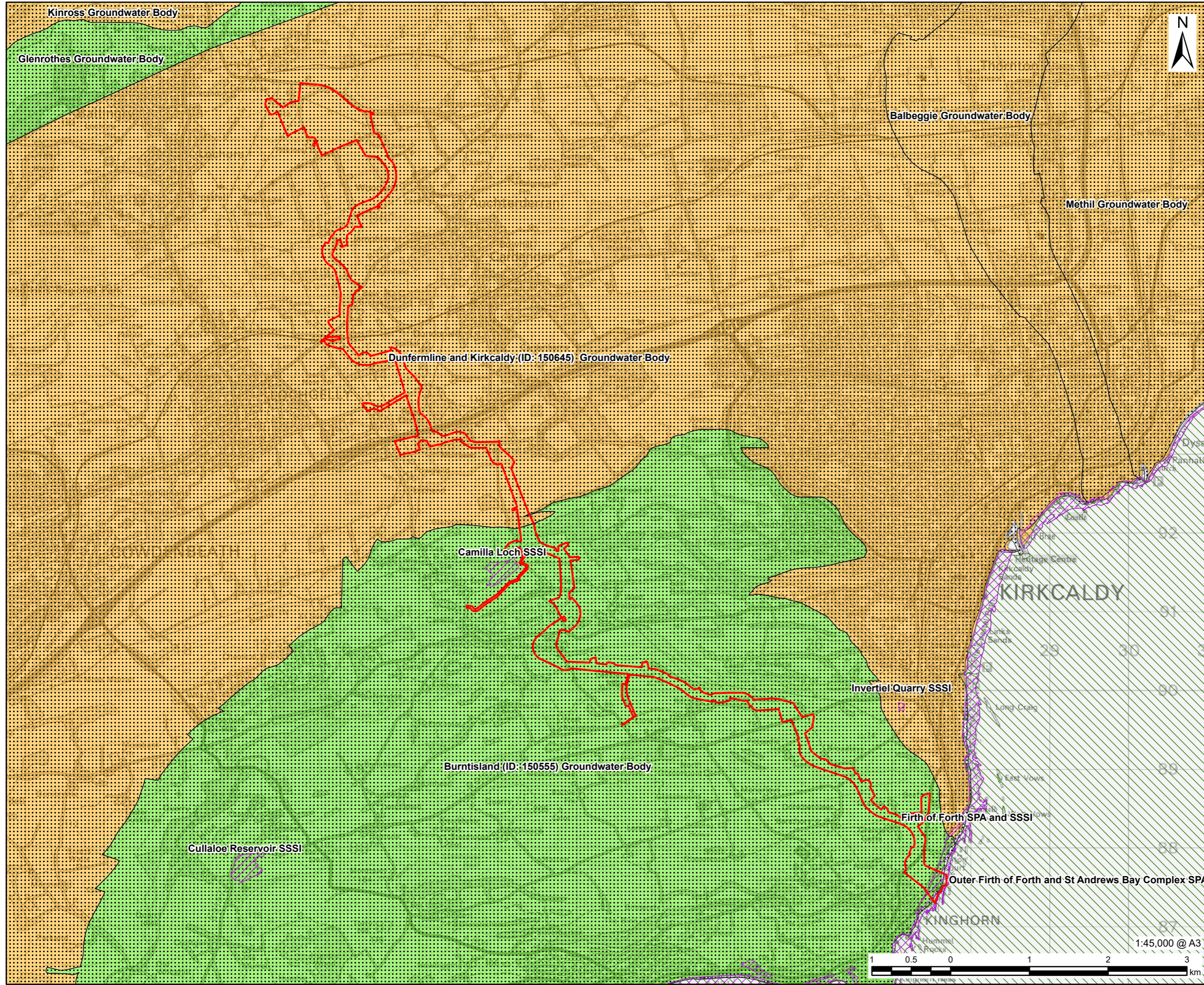
Surface Water Receptors

FIGURE NUMBER

Figure 8.1 (Sheet 2 of 2)

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PROJECT

Eastern Green Link 4

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 Newcastle
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LEGEND

- Planning Application Boundary
- Site of Special Scientific Interest (SSSI)
- Special Protected Area (SPA)
- Drinking Water Protected Areas
- WDF Groundwater Body**
- Good
- Poor

NOTES

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60707131

FIGURE TITLE

Groundwater Receptors

FIGURE NUMBER

Figure 8.2

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The Clackmannan aquifer is also a part of the wider Carboniferous - extensively mined for coal Aquifer group (referred to 'mined' herein). While the Strathclyde Group is a part of the wider Carboniferous – not extensively mined for coal aquifer group (referred to 'unmined' herein). The Unnamed Extrusive Rocks (Dinantian), Unnamed Igneous Intrusion (Carboniferous to Permian) are also considered to form part of the Mixed Sedimentary / igneous bedrock aquifer group.

Clackmannan aquifer

The Clackmannan aquifer is located towards the centre and north of the Scottish Onshore Scheme. It is designated as a moderately productive aquifer and described as a multi-layered aquifer with low yields except where disturbed by mining. Flow is primarily all through fractures and other discontinuities. BGS has limited data concerning the groundwater levels in the surrounding area for this aquifer.

The Clackmannan aquifer is part of the Carboniferous (mined) aquifer group. The Carboniferous (mined) aquifer group has a much higher permeability than the Carboniferous (unmined) aquifer group. Mining has generated more fractures and lines of weaknesses in which groundwater can flow through. Additionally, the removal of restrictive coal seams has allowed for greater groundwater flow. As a result of this mining, groundwater flow paths can reach to length of 1 to 10 km.

The transmissivity of the aquifer ranges between 10-1000 m²/d and specific capacity is 48-132 m³/d/m. Both of these properties indicate a moderate to high ability to transmit water and a moderate to high efficiency. Storativity, which represents the volume of water released is recorded as ~0.0001. For an unconfined moderately productive aquifer the storativity value is likely to be similar to the specific capacity as the water is released through flow through porous lithologies and so large amounts of water may be released. The storativity of ~0.0001 indicates a low storage for a moderately productive aquifer, and that water and flow is restricted, potentially due to confining layers. Therefore, the storativity value suggests that confined aquifers are present, potentially where impermeable coal seams or other lithologies are present. This may mean that during pumping drawdown may occur quicker. The operational yield is recorded as 1987-3279 m³/d. This is a high yield which is likely because of increased groundwater flow through shafts and cavities caused by mining as well as fractures.

There is limited data on the groundwater quality on BGS. There was also no groundwater quality data received from SEPA in the study area. However, records indicate that the groundwater chemistry is described as often anoxic and generally moderately to highly mineralised (Ref 8-101).

Strathclyde Group

The Strathclyde Aquifer is located towards the centre of the Scottish Onshore Scheme. It is designated as a moderately productive aquifer and described as a multi-layered aquifer with fracture flow yielding up to 10 L/s locally. Flow is primarily all through fractures and other discontinuities. BGS has limited data concerning the groundwater levels in the surrounding area for the aquifer.

The Strathclyde Aquifer is part of the Carboniferous (mined) aquifer group. The sandstone units act as discrete aquifer units as they are segmented by low permeability bands of coal

and mudstone. The storativity, transmissivity, and specific capacity recorded are the same as those for the Clackmannan Aquifer. However, operational yield is 131-418 m³/d, considerably lower than the mined Clackmannan Aquifer. This is likely due to the lower permeability of the Strathclyde Group because of the unmined impermeable coal seams within the aquifer.

There is limited data on the groundwater quality on BGS. There was also no groundwater quality data received from SEPA in the study area. However, records indicate that the groundwater chemistry is described as often anoxic and generally moderately to highly mineralised (Ref 8-101).

Unnamed Extrusive Rocks (Dinantian)

The Unnamed Extrusive Rocks (Dinantian) is situated on the southeastern side of the Scottish Onshore Scheme. It has been designated as a low productivity aquifer with small amount of groundwater situated mainly within the upper weathered zone and weathered fractures. However, it is noted there could be up to 2 L/s from rare springs. Flow is primarily through fractures and other discontinuities. BGS has limited data concerning the groundwater levels in the surrounding area for the aquifer.

Unnamed Igneous Intrusion (Carboniferous to Permian)

There are three areas of the Unnamed Igneous Intrusion (Carboniferous to Permian) throughout the Scottish Onshore Scheme. Two areas are situated towards the centre and one area is towards the north around Woodend. It has been designated as a low productivity aquifer with small amount of groundwater situated mainly within surface weathered zones. However, it is noted rare springs may also be present. Flow is primarily through fractures and other discontinuities. BGS has limited data concerning the groundwater levels in the surrounding area for the aquifer.

The Unnamed Extrusive Rocks (Dinantian) and the Unnamed Igneous Intrusion (Carboniferous to Permian) are within the Igneous/Sedimentary aquifer. The properties of groundwater in this aquifer depends on the local proportion of sedimentary and igneous rocks. It is likely that sedimentary bands present will have similar properties to the Carboniferous sedimentary aquifers not extensively mined for coal aquifer (See above). For the igneous lithologies present the properties are likely to be similar to the Igneous Volcanic aquifer. Groundwater chemistry is described as being oxidic, weakly to moderately mineralised and dominated by Ca HCO₂. Groundwater is generally within weathered fractured zones more common at the surface (Ref 8-51).

Superficial Deposits

There is no superficial aquifer listed within the Hydrogeology 625K Scale Map of the UK. However, it is likely that some superficial deposits will hold small volumes of groundwater which could have the potential to support PWS and Groundwater Dependent Terrestrial Ecosystems (GWDTEs). **Table 8-10 Superficial Aquifers** lists each of the superficial deposits found within the study area and their hydrogeological significance.

Superficial deposits overlying the Igneous aquifers will likely be perched and sit above the impermeable bedrock. However, where overlying the Clackmannan and Strathclyde Groups, there could be some groundwater interaction between the bedrock aquifer and the superficial aquifer.

Table 8-10 Superficial Aquifers

Geological Formation	Description	Hydrogeological Significance
Peat	Found in small patches throughout the study area but may underly the Scottish Onshore Scheme in small sections in the north. Mainly a blanket accumulation of wet, acidic, partially decomposed vegetation.	Peat can hold large volumes of water and support small surface water features and sensitive ecosystems.
Alluvium – Clay, Silt, Sand and Gravel	Unconsolidated detrital material consisting of clay, silt, sand and gravel. Larger areas associated with Tiel Burn, Loch Gelly and the River Ore but smaller areas found throughout the middle of the study area.	Alluvial deposits are capable of transporting and storing large volumes of water. Considering the size the deposits, these aquifers will likely be small. However, as the deposits are primarily located next to water features such as Loch Gelly and the River Ore, they will likely be hydraulically connected to the associated water feature.
Lacustrine Deposits	Clastic deposits formed from coarse grained bedload and fine-grained material. Found underlying the Scottish Onshore Scheme at NGR NT 26970 88462.	These deposits will likely be unproductive. There may be small volumes of water situated within perched sand and gravel aquifers
Till, Devensian - Diamicton	Consists of unsorted and unstratified drift with a wide range of clast sizes. Underlies the majority of the study area.	These deposits will likely be unproductive. There may be small volumes of water situated within perched sand and gravel aquifers as indicated by the present of Springs where these deposits are located.
Glaciofluvial Ice Contact Deposits- Gravel, Sand and Silt	Stratified sand, gravel and interbedded diamicton. Locally with lenses of silt, clay and organic material. Found within the study area at NGR NT 21458 92788.	Glaciofluvial Ice Contact Deposits have the potential to hold large volumes of water. Where diamicton is present in the form of glacial till it may act as a confining layer forming perched groundwater. These deposits are located around Gelly Burn and may support the Burn and nearby wetlands.

Groundwater Levels

There is very limited groundwater level data available. However, from borehole records on BGS GeolIndex (Ref 8-101), groundwater levels appear to be relatively shallow. Some records indicate water levels around 4.6 – 8.74 m bgl (BGS ID: 700399 approximately 37.6 m from the study area, and BGS ID: 20922705 approximately 700 m from the study area).

A Geotechnical Interpretative Report (113643-MMD-SPEN-XX-RP-GE-0571) has been carried out. A summary of the groundwater level information can be found below. In summary, groundwater level is relatively shallow with a range of 0.68 mbgl to 1.94 mbgl in the glacial till deposits and within the Clackmannan Group 0.91 mbgl to 1.28 mbgl. Groundwater level

within the Kinghorn Volcanic Formation is slightly deeper ranging from 2.28 mbgl and 6.31 mbgl.

- BH130 - within Kinghorn Volcanic Formation. Groundwater depth is 2.28 to 2.38 mbgl.
- BH132 – within the Kinghorn Volcanic Formation. Initial groundwater strike at 2.70 mbgl. However, dry on the second round of monitoring.
- BH105A – within Kinghorn Volcanic Formation. Groundwater depth is 5.74 to 6.31 mbgl.
- BH110 - within Kinghorn Volcanic Formation. Groundwater depth is 1.42 to 1.68 mbgl.
- BH124 – within Clackmannan Aquifer. Groundwater depth is 0.91 to 1.28 mbgl.
- BH126 – within Clackmannan Aquifer. Groundwater depth is 1.08 to 1.09 mbgl.
- BH127 - within Clackmannan Aquifer. Groundwater depth is 0.95 to 1.08 mbgl.
- BH121 – within glacial till. Groundwater depth is 6.18 mbgl. However, dry on the second round of monitoring.
- WS122 - within Clackmannan Aquifer. Groundwater depth is 0.71 to 0.84 mbgl.
- WS310 – within glacial till. Groundwater depth is 0.94 to 0.97 mbgl.
- WS312 - within glacial till. Groundwater depth is 0.66 to 0.90 mbgl.
- WS315 - within glacial till. Groundwater depth is 0.85 to 0.87 mbgl.
- WS317 – within glacial till. Groundwater depth is 0.89 mbgl.
- WS328 - within glacial till. Groundwater depth is 1.60 to 1.94 mbgl.
- WS330 – within glacial till. Groundwater depth is 0.68 to 0.77 mbgl.

Excavations related to past surface and underground mining within the study area may have affected recharge rates by means of soil compaction where less infiltration may be possible and creating new fractures which may increase infiltration and flow speeds. Potential dewatering of mine water may have also had an impact on groundwater levels and flow within the study area. The presence of springs and wetlands within the study area further suggests shallow groundwater levels. However, it is possible that some wetlands may have been formed as a result of shallow and surface coal and subsequent impermeability.

WFD Designation of Groundwater

From SEPA's classification hub (Ref 8-99) the Scottish Onshore Scheme is located on two WFD groundwater bodies. In the southeastern end of the site, the Burntisland WFD body (ID: 150555) is located which covers an area of 76.1 km². The Burntisland groundwater body has an overall status from 2014 to the latest assessment in 2023 of Good, with quantitative status being Good from 2014 to present, and chemical Status being Good. Between 2012 and 2013 the overall status, quantitative status and surface water interaction were classed as Poor. The status for 'Water Quality' has been classed as Good from 2013 to present with no data for 2012. There is no further information on influences on the groundwater body.

In the northwestern end of the site the Dunfermline and Kirkcaldy WFD groundwater body (ID: 150645) is located with an area of 276.0 km². The overall status and chemical status were classed as Poor between 2012 and present, and water quality which wasn't recorded in 2012 has had a classification of Poor between 2013 and present. There is no information on influences which may be affecting the Groundwater Body's ability to reach 'Good Status'. However, historical mining in the area may have had an impact on groundwater quality. Poor status of groundwater will also play a part in influencing the status of watercourses in the local area.

The WFD parameters and results are displayed in **Table 8-11 WFD Groundwater Bodies (Ref 8-99)**. No information regarding groundwater chemistry was returned by the SPEA FOI request.

Table 8-11 WFD Groundwater Bodies (Ref 8-99)

RBMP Parameter	Burntisland (ID: 150555) (2023)	Dunfermline and Kirkcaldy (ID: 150645) (2023)
Overall status	Good	Poor
Quantitative status	Good	Good
Saline Intrusion	Good	Good
Surface Water Interaction	Good	Good
Water balance	Good	Good
Chemical status	Good	Poor
Chem – Surface Water Interaction	Good	Poor
<i>Specific pollutants</i>	Good	Poor
Chromium	Good	Good
Zinc	Good	Good
Manganese	Good	Poor
<i>Other Substances</i>	Good	Good
Nitrate	Good	Good
<i>Priority substances</i>	Good	Good
Cadmium	Good	Good
Lead	Good	Good
Drinking Water Protected Area	Good	Good
<i>Priority substances</i>	Good	Good
Atrazine	Good	Good
Simazine	Good	Good
<i>Other Substances</i>	Good	Good
Epoxyconazole	Good	Good
Nitrate	Good	Good

RBMP Parameter	Burntisland (ID: 150555) (2023)	Dunfermline and Kirkcaldy (ID: 150645) (2023)
General tests	Good	Poor
Priority substances	Good	Good
Atrazine	Good	Good
Simazine	Good	Good
Trichloroethene	Good	Good
Benzene	Good	Good
Specific pollutants	Good	Good
Chromium	Good	Good
Other Substances	Good	Poor
Electrical Conductivity	Good	Poor
Epoxyconazole	Good	Good
Nitrate	Good	Good
Free Product	Good	Good
Vinyl Chloride	Good	Good
Water quality	Good	Poor

Drinking Water Protected Areas (Groundwater)

All of Scotland’s groundwater bodies have been designated as Drinking Water Protected Areas (DWPA). The different protected areas within the study area are in association with the underlying aquifers.

The DWPA (groundwater) dataset represent the individual groundwater bodies in Scotland. These have been identified by SEPA in line with the requirements of the Water Environment (DWPA) (Scotland) Order 2013 (Ref 8-100). The dataset is required to fulfil the requirements of the Water Framework Directive¹. The study area is located within the Dunfermline and Kirkcaldy DWPA (150645) which is found within the Sub Basin District Forth.

Groundwater Springs

There are a number of springs which are marked on online Ordnance Survey maps (Ref 8-31) and which may indicate the presence of GWDTE, which are discussed in more detail in the following section. Provisionally, six springs have been identified within the study area, generally near/within areas of suspected wetland. Three are located where the moderately productive Clackmannan Aquifer is present, with the rest located where the low productivity Unnamed Extrusive Rocks – Dinantian aquifer is present. Due to the low permeability of the Unnamed Extrusive Rocks aquifer, water is likely perched within the till, peat and alluvium deposits which supports the springs. There may also be areas of wetland associated with surface coal present in the area due to restricted permeability. The identified springs within

¹ While EU directives ceased to have legal effect following Brexit, national legislation including the 2013 Order had incorporated and given effect to the WFD so that its provisions were effectively assimilated. As the term WFD remains used by SEPA and other agencies it is used in this report.

the study area are listed in **Table 8-12 Springs within the study area** and illustrated on **Figure 8.2 Groundwater Receptors** Table 8-12.

Table 8-12 Springs within the study area

Spring ID	Approx. NGR	Approx. Distance to the Scottish Onshore Scheme (m)
Spring 1	NT 27645 88518	156
Spring 2	NT 25773 89067	159
Spring 3	NT 23122 90544	130
Spring 4	NT 21938 91615	320
Spring 5	NT 20638 93631	0
Spring 6	NT 20301 93600	15

Groundwater Dependent Terrestrial Ecosystems

GWDTE are ecosystems which rely upon groundwater for their existence. These ecosystems can be associated with wetlands, springs, rivers, lagoons, etc. More information and assessment on GWDTE can be found within **Chapter 7 Ecology and Nature Conservation** and **Figure 7.5 Scottish Biodiversity List (SBL) Priority Habitats and Otherwise Noteworthy Habitats (Volume 2 Main Report)**.

GWDTE along the route were identified by the Phase 1 Habitat Survey within a 200 m study area and are listed in **Table 8-13 GWDTE within the Study Area** (see **Chapter 7 Ecology and Nature Conservation** for more information). The hydrogeological linkage between the habitat and the working areas were assessed for any potential impact pathways associated with disruption of supply and/or quality within the hydrology and ground water assessment, and any secondary impacts to the habitat will be considered within the ecology and biodiversity assessment. Cross reference with springs listed in **Table 8-12 Springs within the study area** that have been identified from OS maps has also been undertaken. Further information regarding the hydrogeological significance of superficial aquifers is located within **Table 8-10 Superficial Aquifers**.

The majority of GWDTEs were located in the north and centre of the study area where the moderately productive Clackmannan Aquifer underlies. Small areas of peat and alluvium are also likely to support GWDTEs where present. Till, which is present throughout the majority of the study area is unlikely to be highly productive as an aquifer but has the capability of supporting small GWDTEs especially when near surface waters and when overlying productive aquifers between which there may be interaction. The presence of GWDTEs give an insight into the hydrogeological setting, for example where groundwater is present within superficial deposits or shallow within the bedrock. A full assessment on GWDTEs can be found within **Chapter 7 Ecology and Nature Conservation**.

Table 8-13 GWDTE within the Study Area

Name	Habitat Type	Potential Groundwater Dependency	Hydrogeological Relevance	NGR	Distance to the Scottish Onshore Scheme (m)
GWDTE1	Wet Woodland	Moderate	Overlies Peat and moderate Clackmannan Aquifer	NT 19537 97621	46.8 (Permanent Landform Reprofilng)
GWDTE2	g3c7 Deschampsia neutral grassland	Moderate	Overlies Peat and moderate Clackmannan Aquifer	NT 19566 97665	129.7 (Permanent Earthworks)
GWDTE3	Lowland Ferns	Partial Moderate	Overlies Peat and moderate Clackmannan Aquifer	NT 19621 97648	60.1 (Permanent Earthworks)
GWDTE4	Purple Moor Grass and Rush Pastures	Moderate	Overlies Peat and moderate Clackmannan Aquifer	NT 19479 97476	2 (AC Cable Route)
GWDTE5	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Peat, Till and moderate Clackmannan Aquifer	NT 19473 97329	0 (AC Cable Route)
GWDTE6	Wet Woodland	Moderate	Overlies Peat and moderate Clackmannan Aquifer	NT 20780 96453	89.7 (DC Cable Route)
GWDTE7	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Peat and moderate Clackmannan Aquifer	NT 20758 96453	70.5 (DC Cable Route)
GWDTE8	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Till and moderate Clackmannan Aquifer	NT 20606 96159	73.5 (Outfall)
GWDTE9	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Till and moderate Clackmannan Aquifer	NT 19902 95745	0 (Haul Road and DC Cable Route)
GWDTE10	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Till and moderate Clackmannan Aquifer	NT 19743 95657	62.2 (Attenuation Basin 49)
GWTDE11	Purple Moor Grass and Rush Pastures	Moderate	Overlies Till and moderate Clackmannan Aquifer	NT 19816 95661	0 (Gravity Pipe, Attenuation Basin 49 and DC Cable Route)

Name	Habitat Type	Potential Groundwater Dependency	Hydrogeological Relevance	NGR	Distance to the Scottish Onshore Scheme (m)
GWDTE12	Wet Woodland	High	Overlies Till and moderate Clackmannan Aquifer	NT 19800 95630	0 (Gravity Pipe, Attenuation Basin 49 and DC Cable Route)
GWDTE13	Wet Woodland	Partial Moderate	Overlies Alluvium and moderate Clackmannan Aquifer	NT 19862 95283	33.2 (HDD)
GWDTE14	Wet Woodland	High	Overlies Alluvium and moderate Clackmannan Aquifer	NT 19916 95077	111.4 (DC Cable Route)
GWDTE15	Wet Woodland	High	Overlies Alluvium and moderate Clackmannan Aquifer	NT 20007 94963	0 (HDD)
GWDTE16	Wet Woodland	High	Overlies Till and moderate Clackmannan Aquifer	NT 20225 94956	118 (Outfall)
GWDTE17	Wet Woodland	Partial High	Overlies Till and moderate Clackmannan Aquifer	NT 20206 94914	70.3 (Outfall)
GWDTE18	Lowland Mixed Deciduous Woodland	Partial High	Overlies Till and moderate Clackmannan Aquifer	NT 20952 93993	53 (Outfall)
GWDTE19	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Till and moderate Clackmannan Aquifer	NT 21109 93873	87.1 (Outfall)
GWDTE20	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Till and moderate Clackmannan Aquifer	NT 20996 93329	0 (DC Cable Route and Haul Road)
GWDTE21	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Till and moderate Clackmannan Aquifer	NT 21189 93436	41.5 (HDD)
GWDTE22	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Till and moderate Clackmannan Aquifer	NT 21137 93333	0 (HDD)
GWDTE23	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Till and moderate Clackmannan Aquifer	NT 21283 93296	0 (HDD)
GWDTE24	Wet Woodland	High	Overlies Till and moderate Clackmannan Aquifer	NT 22021 92700	128.3 (DC Cable Route and Haul Road)

Name	Habitat Type	Potential Groundwater Dependency	Hydrogeological Relevance	NGR	Distance to the Scottish Onshore Scheme (m)
GWDTE25	Wet Woodland	High	Overlies Till and moderate Clackmannan Aquifer	NT 22067 92516	120.3 (DC Cable Route and Haul Road)
GWDTE26	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Alluvium and Till. Moderate Strathclyde Aquifer and Low Unnamed Igneous Intrusion Mafic Igneous Rock aquifer	NT 22337 92073	0 (HDD)
GWDTE27	Purple Moor Grass and Rush Pastures	Moderate	Overlies Till. Moderate Strathclyde Aquifer and Low Unnamed Igneous Intrusion Mafic Igneous Rock aquifer	NT 22479 92130	38.9 (HDD)
GWDTE28	Purple Moor Grass and Rush Pastures	Moderate	Overlies Till. Moderate Strathclyde Aquifer and Low Unnamed Igneous Intrusion Mafic Igneous Rock aquifer	NT 22873 91931	90 (Outfall)
GWDTE29	Non-NVC Broadleaved Woodland	Moderate	Overlies Till. Moderate Strathclyde Aquifer and Low Unnamed Igneous Intrusion Mafic Igneous Rock aquifer	NT 22837 91840	32.1 (Outfall)
GWDTE30	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Till. Moderate Strathclyde Aquifer and Low Unnamed Igneous Intrusion Mafic Igneous Rock aquifer	NT 22255 91608	42.2 (Existing Road)
GWDTE31	Lowland Mixed Deciduous Woodland	Partial High	Overlies Till. Moderate Strathclyde Aquifer and Low Unnamed Igneous Intrusion Mafic Igneous Rock aquifer	NT 22729 90891	0 (DC Cable Route)
GWDTE32	Purple Moor Grass and Rush Pastures	Moderate	Overlies Alluvium. Moderate Strathclyde Aquifer and Low Unnamed Igneous Intrusion Mafic Igneous Rock aquifer	NT 23022 90418	0 (Outfall)
GWDTE33	Lowland Fens	Moderate	Overlies Alluvium. Moderate Strathclyde Aquifer and Low Unnamed Igneous Intrusion Mafic Igneous Rock aquifer	NT 23102 90425	27 (Outfall)

Name	Habitat Type	Potential Groundwater Dependency	Hydrogeological Relevance	NGR	Distance to the Scottish Onshore Scheme (m)
GWDE34	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Till. Moderate Strathclyde Aquifer and Low Unnamed Igneous Intrusion Mafic Igneous Rock aquifer	NT 23083 90814	85.4 (DC Cable Route)
GWDE35	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Alluvium. Moderate Strathclyde Aquifer and Low Unnamed Igneous Intrusion Mafic Igneous Rock aquifer	NT 23368 90365	0 (DC Cable Route, Outfall, Haul Road, Attenuation Basin 18 and Gravity Pipe)
GWDE36	g3c8 Holcus-Juncus neutral grassland	Moderate	Overlies Till. Moderate Strathclyde Aquifer and Low Unnamed Igneous Intrusion Mafic Igneous Rock aquifer	NT 24977 89889	30 (DC Cable Route)

Mining

Almost the entirety of the Scottish Onshore Scheme is within a coal mining reported area (Ref 8-52). The majority of mining activity is reported in the northwest of the site, where there is a large area of abandoned mine. Within this area there are also significant areas of surface coal resources, surface mining (past and current), past shallow coal mine workings, probable shallow coal mine workings and development high risk areas. There is one mine entry recorded within the study area, which is near Muirhead Quarry. A small area of abandoned mine is also recorded around the B9157 within the Application Boundary.

In addition to coal-mining, there is an area of significant of non-coal mining risk within the area which coincides with the location of oil shale resources present. non-coal mining risk coincides with the location of the oil shale resources. Other mined materials within the study area include igneous rock, Fireclay and Brick Clay which are located alongside the shallow coal in the north of the site, and Blackband Ironstone within the area of Lochgelly. There is the potential for infilled quarries of igneous rock to be present across the south of the site.

The presence of extensive historical mining activity within the study area is likely to have had an impact on the quality, flow and levels of both surface water and groundwater in the area.

Conceptual Model

There are two moderately productive aquifers located within the study area; the Clackmannan Aquifer in the north and the Strathclyde Aquifer in the centre. Both are recharged from rainfall infiltrating the aquifer where bedrock is exposed or through thin permeable layers of superficial deposits, such as alluvium, peat and glaciofluvial deposits. Recharge may also occur to some extent through the less permeable till where sand and gravels are present.

Groundwater flow is dominated by fracture flow. Therefore, groundwater will likely be concentrated around fault lines and the upper weathered zones of the aquifer. The Clackmannan aquifer is part of the larger Carboniferous (mined) aquifer and where extensive

mining has taken place, groundwater will move through mine shafts and where coal seams have been excavated. In contrast the Strathclyde Aquifer is part of the Carboniferous (unmined) aquifer and therefore there will be less groundwater flow than Clackmannan Aquifer. Where impermeable coal seams may be present within the Strathclyde Aquifer, confined or partially confined aquifers may be present within the bedrock.

There is not enough data available to accurately predict the overall direction of groundwater flow within any aquifers identified within the study area. However, it can be assumed that groundwater flows along bedding plans, mine shafts within the mined Clackmannan Aquifer, along fractures and fault lines. Groundwater within the upper weathered zones will also likely flow downgradient with the topography and in the direction of major rivers flows.

There will likely be some hydrogeological connection between the aquifers and the major surface water features such as the River Ore and Camilla Loch. Around these locations, it could be assumed groundwater levels to be similar to the surface water level. Interaction will also occur between the larger alluvium deposits surrounding the major surface water features.

By contrast, the Unnamed Extrusive Rocks – Dinantian and Unnamed Igneous Intrusion Carboniferous to Permian aquifers are much more impermeable and have a low productivity. It is likely that if any groundwater exists within igneous lithologies, it will be concentrated around faults and within upper weather zones.

Where perpendicular inferred faults are present groundwater may move in different directions either side of the faults. Rainwater will likely collect within the overlying peat and till, which will create boggy and waterlogged conditions. Within the peat and till, groundwater will also likely be perched or have limited intergranular flow within the sands and gravels of the till between the clays. Tiel Burn will likely be hydrogeologically connected to the surrounding alluvial deposits but not the impermeable bedrock aquifer.

Within the Unnamed Extrusive Rocks – Dinantian and Unnamed Igneous Intrusion Carboniferous to Permian aquifers there is the possibility of confined aquifers. There is limited borehole information for the Unnamed Igneous Intrusion Carboniferous to Permian aquifer. However, the size of this aquifer when present is relatively small and surrounded almost entirely by the sedimentary aquifers. There is a possibility that some of the sedimentary units from the Clackmannan Aquifer and the Strathclyde Aquifer are interbedded between the igneous units of the Unnamed Igneous Intrusion Carboniferous to Permian aquifer, and so confined or partially confined aquifers may be present within the bedrock.

Surface Water Features

The surface water features within the study area are presented in this section. An initial scoping of the area examined all possible water features to be included and scoped these in or out of the purview of this report according to relevance to the project. This is shown in **Table 8-14 Scoping Decisions of Water Features**.

Table 8-14 Scoping Decisions of Water Features

Water Feature	Relevance to the Project	Scoped In/Out	Reason (reference to crossing or outfall ID)
Banchory Burn	Small tributary of Tyrie Burn flowing across the site. Flows west to east. Sourced from around NT 24566 88242.	Scoped In	Two temporary drainage outfalls may flow into this water feature (SDP 07 and SDP 06) and there is a proposed crossing (WA/013).
Tyrie Burn	Watercourse flowing across the site and out to sea at nearby Seafield Beach. Sourced from NT 25163 89037 and flows west to east.	Scoped In	Has a water crossing (WA/016) and three temporary drainage outfalls may flow into this watercourse (SDP 03, SDP 08 and SDP 09).
Tiel Burn and tributaries including Bottom Burn	Watercourse and tributaries flowing across site at several points and out to sea at Seafield Beach. Sourced from NT 19653 89361 and flows west to east.	Scoped In	Has a crossing (WA/040) and temporary drainage outfalls may flow into this watercourse (SDP 19, SDP 21 and SDP22).
Raith Lake	Water feature located outside proposed site but downstream along Dronachy Burn. Located at NT 26342 91400. It has previously been used as a recreational fishing lake but has recently closed.	Scoped in	Indirect water quality impacts may occur via Dronachy Burn. However, the distance downstream is around 3 km so this is precautionary.
Dronachy Burn	Tributary of Tiel Burn via Raith Lake, crossing proposed site. A small sewerage treatment works and a chemical works in the upper catchment to this burn is likely to influence its water quality, although flows from Camilla Loch may dilute any chemical substances. Flows west to east. Sourced from NT 18049 90157.	Scoped In	Two temporary drainage outfalls may flows directly into this water feature (SDP 26 and SDP 25) and there is a proposed cable route crossing (WWA/051).
Camilla Loch	Water feature 320 m from proposed site, 50-100 m from existing access track for mobilisation. Tributary of Dronachy Burn. Situated at NT 21992 91471	Scoped Out	Upstream and over 300 m from proposed cable corridor. An access track passes approx. 50-100 m uphill of this water feature, but this will only be used for some occasional access to site and receive minor pothole repair works, if any.
Unnamed ditches/drains	Series of unnamed ditches/drains which may be present throughout the site.	Scoped In	Multiple temporary drainage outfalls and crossings proposed.

Water Feature	Relevance to the Project	Scoped In/Out	Reason (reference to crossing or outfall ID)
Gelly Burn	Outflow of Loch Gelly at NT 20752 92529 that crosses the site; tributary of the Den Burn.	Scoped In	Three temporary drainage outfalls may flow directly into the water feature (SDP 31, SDP 32 and SDP 33). Water course crossing (WA/063).
Loch Gelly	Large water feature 700 m outside and upstream of the site. Situated at NT 20094 92526	Scoped out	No direct flow pathways to the water feature.
Unnamed Lochs	Two small unnamed lochs situated NT 21886 92433 and NT 21583 92420 at 240 m and 610 m away from ite respectively. The western one looks to be a disused quarry according to OS Maps (Ref 8-31).	Scoped out	No direct flow pathways to the water feature.
Den Burn	Situated to the east of the site (NT 22518 93078). It sourced from Gelly's Burn and flows north into the River Ore.	Scoped In	Indirect water quality impacts via Gelly Burn.
River Ore	Outflow of Loch Ore (NT 17329 95784) passing through northern end of the site. Flows roughly west to east.	Scoped In	Two temporary drainage outfalls may flow directly into the water feature (SDP 44 and SDP 46). Cable route watercourse crossing proposed (WA/093).
Lochty Burn	Situated approximately 340 m north of the site.	Scoped Out	Whilst some watercourses are found within the catchment region, no direct flow pathways to the water feature have been identified.
Unnamed ditches/drains	Series of unnamed ditches/drains which may be present throughout the site.	Scoped In	Multiple outfalls and crossings proposed.

After this initial scoping process, the water features were identified in greater detail to relate source of impact from the Scottish Onshore Scheme to the specific watercourse or its tributary. There are five catchments within which every watercourse has been allocated a project specific ID for clarity. This includes some scoped out but requiring IDs for reference in this report. Many of these water features are unnamed and so are listed as numbered tributaries only. The NGR provided are for the proximate source of that water feature where possible. They are listed in **Table 8-15 Surface Water Features within the Study Area** and presented on **Figure 8-1 Surface Water Receptors**.

Table 8-15 Surface Water Features within the Study Area

Catchment	Water Feature	Project specific ID	Approx. NGR
Coastal	Banchory Burn	COA1	NT 25130 88397
	Tributary of Banchory Burn	COA2	NT 26037 88605
	Tyrie Burn	COA3	NT 26015 88893
	Tributary of Tyrie Burn	COA4	NT 26062 89061
Tiel Burn	Tiel Burn (inc.Bottom Burn)	TIE1	NT 19710 88943
	Tributary of Tiel Burn	TIE2	NT 25465 89890
	Tributary of Tiel Burn	TIE3	NT 24302 89572
	Tributary of Tiel Burn	TIE4	NT 23896 90299
	Tributary of Tiel Burn	TIE5	NT 20685 89174
	Tributary of Tiel Burn	TIE6	NT 22675 90584
Dronachy Burn	Dronachy Burn	DRO1	NT 20003 91223
	Unnamed ditch	DRO2	NT 22755 91365
	Tributary of Dronachy Burn	DRO3	NT 21632 91222
	Camilla Loch	DRO4	NT 21919 91363
	Diana's Fountain	DRO5	NT 22928 91671
	Tributary of DRO5	DRO6	NT 22873 91996
	Tributary of DRO5	DRO7	NT 23124 91884
	Tributary of DRO5	DRO8	NT 23344 91847
	Raith Lake	DRO9	NT 26098 91404
	Raith Lake outflow	DRO10	NT 26235 91285
Den Burn	Den Burn (inc. Gelly Burn)	DEN1	NT 20745 92525
	Tributary of Den Burn	DEN2	NT 22410 92253
	Loch Gelly	DEN3	NT 19643 92414
	Unnamed ditch	DEN4	NT 21769 91881
	Tributary of Den Burn	DEN5	NT 21816 92883

Catchment	Water Feature	Project specific ID	Approx. NGR
	Tributary of Den Burn	DEN6	NT 21737 92851
	Tributary of Den Burn	DEN7	NT 21609 92776
	Unnamed ditch	DEN8	NT 21674 92743
River Ore	River Ore	ORE1	NT 17323 95776
	Tributary of River Ore	ORE2	NT 20244 93728
	Tributary of ORE2	ORE3	NT 21402 94604
	Tributary of ORE2	ORE4	NT 20640 93634
	Tributary of ORE2	ORE5	NT 21006 93858
	Tributary of ORE2	ORE6	NT 21145 93855
	Tributary of River Ore	ORE7	NT 20333 94311
	Tributary of River Ore	ORE8	NT 19409 94762
	Tributary of River Ore	ORE9	NT 20112 94829
	Tributary of River Ore	ORE10	NT 20143 94946
	Tributary of River Ore	ORE11	NT 20252 95415
	Tributary of ORE11	ORE12	NT 20022 95396
	Tributary of River Ore	ORE13	NT 20197 95682
	Tributary of ORE13	ORE14	NT 19029 95270
	Tributary of ORE13	ORE15	NT 19819 95776
	Tributary of ORE13	ORE16	NT 18823 95870
	ORE20 outflow	ORE17	NT 19172 96488
	Tributary of ORE17	ORE18	NT 20473 96149
	ORE20 outflow	ORE19	NT 21108 96017
	Unnamed reservoir	ORE20	NT 20709 95869
	ORE20 outflow	ORE21	NT 21337 95867
Lochty Burn	Unnamed lake	LOC1	NT 20180 97620
	LOC1 outflow	LOC2	NT 21051 97997
	Tributary of Lochty Burn	LOC3	NT 20561 97444

Catchment	Water Feature	Project specific ID	Approx. NGR
	Tributary of LOC2	LOC4	NT 19534 97153
	Tributary of LOC2	LOC5	NT 20059 97660
	Tributary of LOC2	LOC6	NT 20060 97597
	Tributary of LOC4	LOC7	NT 19095 96751
	Tributary of LOC7	LOC8	NT 18945 97291
	Tributary of LOC7	LOC9	NT 19479 97277
	Unnamed ditch	LOC10	NT 19490 97349
	Lochty Burn	LOC11	NT 16687 97256

Coastal Area

There are only two named water courses in the coastal catchment, the Banchory Burn and the Tyrie Burn, each with a single additional tributary. These are modified and bounded by farmland. Neither of these are assigned WFD statuses by SEPA.

Banchory Burn has a straight course with a uniform, trapezoidal and narrow channel, likely a result of historical modification. During the survey, the steep banks were overgrown with vegetation and the bed comprised of sand and cobbles. The tributary of Banchory Burn is similarly modified with overgrown banks. The base is comprised of sand and gravel over which water runs clear. No protected species have been recorded on the Banchory Burn (please refer to **Chapter 7 Ecology and Nature Conservation** for further details).

Tyrie Burn is a straightened and trapezoidal channel, likely resulting from historical modification. Any flow and the bed were obscured by vegetation on the overgrown banks. The tributary of Tyrie Burn surveyed, showed similar modified conditions.

Otter activity has recently been recorded on the Tyrie Burn during surveys between 16 September and 23 October 2024 (see **Volume 5 Confidential Appendix 7.1 Otter and Badger**), though little else is recorded about the ecology of this water feature.

No flow gauging data is available for these two watercourses. Based on historical flow data from nearby similar watercourses, both the Banchory Burn and Tyrie Burn have an estimated Q95 (5 percentile) flow between 0.001 m³/s and 1.0 m³/s.

Tiel Burn

The Tiel Burn catchment consists of the Tiel Burn, the Bottom Burn (a water course that forms into the Tiel Burn) and several tributaries. The Tiel Burn flows east to the north of the coastal water features described above. SEPA classifies the Tiel Burn (WFD ID: 6882) as having an Overall Status of 'Moderate Ecological Potential' in 2023. It has been classed as this or Moderate for several years previously but had been classed as Poor or Bad prior to 2013. A breakdown of the Tiel Burn's WFD assessment is given in **Table 8-16 Water Classification Data for Tiel Burn (Ref 8-53)**.

Table 8-16 Water Classification Data for Tiel Burn (Ref 8-53)

Parameter	Classification (2023)
Overall Status	Moderate Ecological Potential
Pre-HMWB Status	Poor
Overall Ecology	Poor
Physico-Chem	High
Temperature	High
Reactive Phosphorus	High
Dissolved Oxygen	High
Acidity	High
pH	High
Biological Elements	Moderate
Invertebrate Animals	Good
Macroinvertebrates (RiCT/WHPT)	Good
Macroinvertebrates (ASPT)	Good
Macroinvertebrates (NTAXA)	High
Alien Species	Moderate
Fish	High
Fish Barrier	High
Aquatic Plants	Good
Macrophytes	Good
Phytobenthos (Diatoms)	Good
Specific Pollutants	Pass
Ammonium	Pass
Hydromorphology	Poor
Morphology	Poor
Overall Hydrology	High
Modelled Hydrology	High
Hydrology (Medium/High Flows)	High
Hydrology (Low Flows)	High
Water Quality	Good
HMAWB Assessment	Good ecological potential
New Pre-HMAWB Test	Moderate

Parameter	Classification (2023)
Specific Pollutants – Tier 6	Pass

The main stem of the Tiel Burn is approximately 9.9 km in length and is described as heavily modified due to the physical alterations made to it that cannot be altered without significant harm to the drainage of surrounding agricultural land. The Tiel Burn flows through the southern region of Kirkcaldy before entering the sea at NGR NT 27942 90170. Field observations show this to be the case, with the channel straightened and modified to provide irrigation to surrounding agricultural land. This is shown in **Plate 8.1 Tiel Burn, photographed 2 July 2025 from NT 22854 90380, looking upstream.**



Plate 8.1 Tiel Burn, photographed 2 July 2025 from NT 22854 90380, looking upstream.

The ecology surveys of the Tiel Burn indicate some species of note. Recent otter activity has been recorded on the Tiel Burn and one of its tributaries (see **Volume 5 Confidential Appendix 7.1 Otter and Badger**). As shown by SEPA’s most recent classification above, the potential for fish migration is deemed High and it is classed as Good for invertebrate and plant species.

The Tiel Burn has an estimated Q95 (5 percentile) flow between 0.001 m³/s and 1.0 m³/s.

Dronachy Burn

The Dronachy Burn flows east across the Fife landscape, to the north of the Tiel Burn. It enters Raith Lake at NGR NT 26098 91404. An outflow from Raith Lake then enters the Tiel Burn at NGR NT 26699 90426. The Dronachy Burn has a major tributary called Diana’s Fountain, which itself has three smaller tributaries.

SEPA’s WFD classifications have designated the Dronachy Burn (WFD ID: 6883) an Overall Status of ‘Moderate Ecological Potential’ in 2023. This has been the case since 2019. It was classified as Moderate in the years 2017-18, and either Poor or Bad in the years prior to that to 2007. A more detailed breakdown of the 2023 designations for the Dronachy Burn are presented here in **Table 8-17 Water Classification Data for Dronachy Burn (Ref 8-53)**.

Table 8-17 Water Classification Data for Dronachy Burn (Ref 8-53)

Parameter	Classification (2023)
Overall Status	Moderate Ecological Potential
Pre-HMWB Status	Bad
Overall Ecology	Bad
Physico-Chem	Moderate
Temperature	High
Reactive Phosphorus	Moderate
Dissolved Oxygen	High
Acidity	High
pH	High
Biological Elements	Moderate
Invertebrate Animals	High
Macroinvertebrates (RiCT/WHPT)	High
Macroinvertebrates (ASPT)	High
Macroinvertebrates (NTAXA)	High
Fish	Moderate
Fish Barrier	Moderate
Aquatic Plants	Moderate
Macrophytes	High
Phytobenthos (Diatoms)	Moderate
Specific Pollutants	Pass
Ammonium	Pass
Hydromorphology	Bad
Morphology	Bad

Parameter	Classification (2023)
Overall Hydrology	Moderate
Modelled Hydrology	Poor
Hydrology (Medium/High Flows)	Moderate
Hydrology (Low Flows)	Poor
Ecological Indicators	Pass
Water Quality	Moderate
HMAWB Assessment	Moderate
New Pre-HMAWB Test	Moderate
Specific Pollutants – Tier 6	Pass

SEPA describes the Dronachy Burn as being approximately 11.1 km in length and as heavily modified, with physical alterations unable to be made without significantly impacting the drainage of surrounding farmland. From observations made on a field survey of the site, this is confirmed, with the channel highly modified into a straightened course to provide drainage to surrounding farmland, as shown in **Plate 8.2 Dronachy Burn, photographed 2 July 2025 at NT 22730 91070, looking upstream.**



Plate 8.2 Dronachy Burn, photographed 2 July 2025 at NT 22730 91070, looking upstream.

Otter activity has been recorded recently on the Dronachy Burn 16 September and 23 October 2024 (see **Volume 5 Confidential Appendix 7.1 Otter and Badger**). The SEPA classifications describe it as a Moderate water feature for fish migration and aquatic plants, whilst the presence of invertebrate species is deemed as High.

The Tiel Burn has an estimated Q95 (5 percentile) flow between 0.001 m³/s and 1.0 m³/s.

Den Burn

The Den Burn, located to the north of the Dronachy Burn, is a major tributary of the River Ore. It originates from the Gelly Burn, an outflow of Loch Gelly which widens into the Den Burn before flowing north to a confluence on the River Ore at NGR NT 22133 95364. It passes through farmland, the Carden Den forest and the southern region of the small town of Cardenden on its route.

In 2023, SEPA designated the Den Burn (WFD ID: 6310) a WFD classification of 'Poor Ecological Potential'. It had been classed as Moderate from 2007 to 2018, when it was reclassified as Poor. A full breakdown of the other parameter classifications for 2023 is presented in **Table 8-18 Water Classification Data for Den Burn (Ref 8-53)**.

Table 8-18 Water Classification Data for Den Burn (Ref 8-53)

Parameter	Classification (2023)
Overall Status	Poor Ecological Potential
Pre-HMWB Status	Bad
Overall Chemistry	Pass
Priority Substances	Pass
Cadmium	Pass
Lead	Pass
Nickel	Pass
Overall Ecology	Bad
Physico-Chem	Good
Temperature	High
Reactive Phosphorus	Good
Dissolved Oxygen	High
Acidity	High
pH	High
Biological Elements	Poor
Invertebrate Animals	Moderate
Macroinvertebrates (RiCT/WHPT)	Moderate
Macroinvertebrates (ASPT)	Moderate
Macroinvertebrates (NTAXA)	High
Fish	Poor
Fish Barrier	Poor
Specific Pollutants	Pass
Arsenic	Pass
Iron	Pass
Copper	Pass
Zinc	Pass
Ammonium	Pass
Chromium	Pass
Manganese	Pass
Hydromorphology	Bad
Morphology	Bad

Parameter	Classification (2023)
Overall Hydrology	High
Modelled Hydrology	High
Hydrology (Medium/High Flows)	High
Hydrology (Low Flows)	High
Water Quality	Moderate
HMAWB Assessment	Poor
New Pre-HMAWB Test	Moderate
Specific Pollutants – Tier 6	Pass

The Den Burn has a length of approximately 5.4 km and is designated as heavily modified with no physical alterations possible without potentially significant impacts on surrounding agricultural land. Field observation of this watercourse confirms that it is highly modified, straightened along the edge of fields and agricultural land to provide drainage. This is shown in **Plate 8.3 Den Burn, photographed 3 July 2025 from NT 22005 92873, looking downstream.**



Plate 8.3 Den Burn, photographed 3 July 2025 from NT 22005 92873, looking downstream.

No protected species are recorded in the Den Burn. SEPA classify the water feature as Poor for fish migration access and Moderate for invertebrate species.

The Den Burn has an estimated Q95 (5 percentile) flow between 0.001 m³/s and 1.0 m³/s.

River Ore

The River Ore is the largest river considered here. It is sourced at NGR NT 15126 95558 as a small inflow to Loch Ore, then flows east for approximately 27 km before entering the River Leven at NGR NO 33590 00292, which then enters the sea a short distance further east at NGR NO 38131 00390. Much of this distance is a landscape of agricultural use, with some wooded areas and small towns such as Cardenden, Thornton and Windygates.

At the point of crossing the River Ore is designated as the reach between ‘Loch Ore and Cardenden’ (WFD ID: 6305). In 2023 and the preceding four years this reach had an overall status classification of ‘Poor Ecological Potential’. It was classified as Good from 2015-17 and Moderate from 2007-14. Within about 2 km and downstream of the Den Burn confluence, the reach is designated as ‘Cardenden to River Leven’ (ID: 6304). The 2023 status for this reach is also ‘Poor Ecological Potential’. The full range of parameter classifications for both WFD water feature reaches for 2023 are presented in **Table 8-19 Water Classification Data for River Ore (2023) (Ref 8-53)**.

Table 8-19 Water Classification Data for River Ore (2023) (Ref 8-53)

Parameter	Classification (2023)	
	River Ore (Loch Ore to Cardenden) (ID: 6305)	River Ore (Cardenden to River Leven) (ID: 6304)
Overall Status	Poor	Poor
Pre-HMWB Status	Poor	Poor
Overall Chemistry	Pass	-
Priority Substances	Pass	-
Nickel	Pass	-
Overall Ecology	Poor	Poor
Physico-Chem	High	High
Temperature	High	High
Reactive Phosphorus	High	High
Dissolved Oxygen	High	High
Acidity	High	High
pH	High	High
Biological Elements	Poor	Poor
Invertebrate Animals	Good	Moderate
Macroinvertebrates (RiCT/WHPT)	Good	Moderate
Macroinvertebrates (ASPT)	Good	Moderate
Macroinvertebrates (NTAXA)	High	High
Fish	Poor	Poor
Fish Barrier	Poor	Poor
Aquatic Plants	Good	-
Phytobenthos (Diatoms)	Good	-
Specific Pollutants	Pass	Pass
Iron	Pass	Pass
Copper	Pass	-
Zinc	Pass	-
Ammonium	Pass	Pass
Manganese	Pass	Pass
Hydromorphology	Moderate	Poor
Morphology	Moderate	Poor
Overall Hydrology	High	High
Modelled Hydrology	High	High
Hydrology (Medium/High Flows)	High	High
Hydrology (Low Flows)	High	High
Water Quality	Good	Moderate
New Pre-HMAWB Test	Good	Moderate
Specific Pollutants – Tier 6	Pass	Pass

Field observations of the River Ore show it to be in a more natural state than other observed water features in the area, with more natural pathways and fluvial actions occurring across the landscape. Due to the nature of the surrounding land use, there will likely be many modifications to prevent flooding and increase drainage, but it has greater hydromorphological distinction than other comparable watercourses nearby. This is shown in **Plate 8.4 River Ore, photographed 3 July 2025 from NT 20162 94902, looking downstream.** However, SEPA describes the stretch of river further downstream (shown in **Table 8-19 Water Classification Data for River Ore (2023) (Ref 8-53)** as ID: 6304) as being heavily modified, indicating that the river is channelled and altered due to land use along much of its subsequent length.



Plate 8.4 River Ore, photographed 3 July 2025 from NT 20162 94902, looking downstream.

No recent otter recordings are known from the River Ore. SEPA classify the river as Poor for fish migration but Good for invertebrate and aquatic plant species.

The River Ore has an estimated Q95 (5th percentile) flow between 0.001 m³/s and 1.0 m³/s. The gauging station Ore at Balfour Mains (station number: 17004) has historically measured the Q95 flow as 0.396 m³/s.

Private Water Supplies

PWS serving domestic premises with less than 50 inhabitants are regulated by the Private Water Supplies (Scotland) Regulations 2006 (Ref 8-104). This legislation states that all PWS within the Fife area must be registered with Fife Council.

The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017 (Ref 8-105) aim to protect human health from the adverse effects of any contamination of

water intended for human consumption by ensuring that the water meets water quality standards.

There are two types of PWS defined in the regulations, Type A and Type B. Type A PWS are larger supplies (providing 10 or more cubic metres of water per day or serving 50 or more persons) or supplies that have a commercial or public activities usage irrespective of size. These are regulated by the Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017 (Ref 8-105). Type B PWS locations are those serving 50 persons or less and are regulated by Private Water Supplies (Scotland) Regulations 2006 (Ref 8-104).

A response from Fife Council on 28 May 2025 states that four PWS are located within the study area.

Following an initial survey of the area, an additional PWS was identified in a neighbouring property to Piteadie, at Broadleys Bagpipes and Reeds. The NGR for this supply was identified as approx. NGR NT 25508 89690. Due to the proximity of both the Piteadie and Broadleys PWS to the Scottish Onshore Scheme, a survey was given to the landowners on 03 July 2025 to gather more information regarding the Piteadie bore and Broadleys Spring. All PWS identified throughout the study area are displayed in **Table 8-20 Identified PWS within the study area**.

Appendix 8.1 PWS Risk Assessment (Volume 4 Appendices) assesses the potential risks to each individual PWS.

Table 8-20 Identified PWS within the study area

ID	Name	Known to Fife Council	Type A or Type B	Approx. NGR	Source of Supply	Closest Works
PWS-01	Piteadie	Yes	A	NT 25684 89313	Borehole	DC cable trench (160m)
PWS-02	Broadleys Bagpipes and Reeds	No	Assumed Type B (not recorded with Fife Council)	NT 25982 89158 (approximately)	Spring/Shallow Groundwater	Haul Road/ DC cable trench (0m)
PWS-03	North Glassmount	Yes	B	NT 24600 88900	Spring	Access route (913m)
PWS-04	Meadowfield	Yes	B	NT 22447 88844	Spring	Access Route (1348m)
PWS-05	Balbie	Yes	B	NT 22262 88558	Spring	Access Route (1667m)

Water Resources

CAR authorisation is intended to control impacts on the water environment, including mitigating the effects on other water users. There are three levels of CAR authorisation: General Binding Rules (GBR), CAR Registration and CAR Licence. GBRs represent a set of mandatory rules which cover specific low risk activities, no application is required to be made to SEPA. Registration allows for small-scale activities that individually pose low environmental risk but, cumulatively, can result in greater environmental risk. Licences allow for site-specific conditions to be set to protect the water environment from activities that pose a higher risk.

Data on CAR authorisations were received from SEPA. Within the 1 km study area there are 59 CAR authorisations recorded. However, there is no information on the level of CAR authorisation available. These are listed in **Volume 4 Appendices, Appendix 8.5 CAR Licences** and presented on **Figure 8-1 Surface Water Receptors**. The majority are related to sewage treatment. However, four authorisations (CAR41 Minto Minewater Treatment Scheme Dundonald, CAR44 Minto Wetlands Brigg hills Farm Dundonald, CAR48 Craigs Quarry Kinglassie Road and CAR58 Westfield OCCS Cardenden Fife) are related to mine water, including abstraction, effluent and point source discharges. All are over 250 m away from the Application Boundary, apart from CAR41 which is approximately 150 m away. While the discharges listed under CAR authorisations are not classified as receptors in this chapter, they are referenced to aid in understanding the overall water quality.

The activity of CAR47 B921 Woodend Road Auchterderran is listed as sediment removal. The associated NGR of CAR47 shows the authorisation is related to Kirk Burn, a tributary of the River Ore located 600 m from the Scottish Onshore Scheme. Similarly, this CAR authorisation is also regarded as a tool to support the understanding of overall water quality of Kirk Burn.

Ecological Designations

The entire Outer Firth of Forth and St Andrews Bay Complex is considered as a Special Protection Area (SPA) and a Site of Special Scientific Interest (SSSI) (Ref 8-42). However, as the Marine Scheme is proposed to come ashore and connect with the Scottish Onshore Scheme above Mean High Water Spring Tide given the rocky foreshore at this location, there is no scope for direct impacts to coastal waters. There is the possibility of chemical spillages affecting watercourses that then flow to the shore, but it is expected that dilution enroute and in coastal waters will reduce any potential for significant adverse effects. Therefore, no further assessment is proposed.

There is also a SSSI located around NT 27074 89788 called Inveriel Quarry. It is located approximately 1.3 km to the east of the Scottish Onshore Scheme. However, it is designated as a SSSI due to its geological features and so is not considered in this report.

There is another SSSI at approx. NT 20001 92528 called Camilla Loch (DRO4), which is approximately 325 m from, and upstream, of the cable corridor, and thus will not be directly impacted by its installation. An existing tarmac access track from Fonthill Avenue runs east-west to the south of the loch c. 85-100 m away, before veering north to cross the downstream end of the loch c. 40 m from the loch. Although relatively close to the loch, only very minor works, if any, would be made to this track, such as the filling of some potholes, and it is understood that there is no positive drainage of the access road, with surface water runoff running off to the edge. Therefore, there would be no flow pathway to Camilla Loch from this access track. As described later, vehicles using the track will need to be well maintained and those involved in earthworks may need to pass through wheel washes before using this road. It is therefore scoped out for assessment here due to the negligible risk of these activities.

Where these sites may be water dependent and downstream of the works with an impact pathway they will be considered in the baseline when determining the importance of water features. However, impacts on the designated sites per se will be considered by the National Vegetation Classification (NVC) survey as discussed in **Chapter 7 Ecology and Nature Conservation**