

## 7 Geology, Hydrology and Hydrogeology

### 7.1 Introduction

This chapter of the EIA provides an assessment of the likely significant effects from the proposed development on hydrogeology, flood risk and drainage. The assessment is based on the characteristics of the site and surrounding area and the key parameters of the proposed development detailed in [Chapter 2 – Site and Surrounding Area](#) and [Chapter 3 – The Proposed Development](#) respectively.

This chapter has been prepared by SLR Consulting Ltd, in line with best practice. A statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this EIA is provided in [Appendix 1.1](#).

The Chapter outlines the embedded good practice methods which have been incorporated in the design and would be used to prevent or reduce identified effects and risks. Further mitigation methods to assess any potential effects are proposed, where appropriate, and residual effects are then assessed.

In addition, the assessment uses information and findings presented in the consented Revised Coire Glas Pumped Storage Scheme (Reference: ECU00000577). Please see [Chapter 2.4](#) which identifies the relevant planning history.

This chapter is supported by the following figures and technical reports:

- Figures:
  - Figure 7.1a to 7.1d – Local Hydrology;
  - Figure 7.2 – Soils;
  - Figure 7.3 – Superficial Geology;
  - Figure 7.4 – Peatland Classification;
  - Figure 7.5a – Bedrock Geology;
  - Figure 7.5b – Bedrock Geology Legend;
  - Figure 7.6 – Regional Hydrology; and,
  - Figure 7.7 – Groundwater Vulnerability.
- Appendices:
  - Appendix 7.1: Schedule of Watercourse Crossings; and,
  - Confidential Appendix 7.2: Private Water Supply Risk Assessment (PWSRA).

### 7.2 Policy Context, Legislation, Guidance and Standards

#### Legislation

The overarching legislative framework applicable to this EIA for the proposed development is outlined in [Chapter 5 – Legislative and Policy Context](#). Over and above this there are no statutory provisions of specific relevance to this assessment.

#### Policy

The planning policy framework applicable to this EIA for the proposed development is outlined in [Chapter 5 – Legislative and Policy Context](#). In summary The National Planning Framework 4 (NPF4) adopted by the Scottish Government on 13 February 2023 provides planning guidance and policies regarding sustainable development, tackling climate change and achieving net zero. Policies relevant to this Chapter include:

- Policy 2 (Climate Mitigation and Adaptation);
- Policy 4 (Natural Places);
- Policy 5 (Soils);
- Policy 20 (Blue and Green Infrastructure); and,
- Policy 22 (Flood Risk and Water Management).

In addition to National Planning Framework 4, the statutory Development Plan applicable to the site presently comprises:

- Highland-wide Local Development Plan (adopted April 2012); and,
- West Highlands and Islands Local Development Plan (adopted September 2019).

Planning policy considerations from the Highland-wide Local Development Plan of specific relevance to this assessment are identified below:

- Policy 57: Natural, Built and Cultural Heritage;
- Policy 60: Other Important Habitats and Article 10 Features;
- Policy 63: Water Environment;
- Policy 64: Flood Risk;
- Policy 66: Surface Water Drainage;
- Policy 67: Renewable Energy Developments; and,
- Policy 72: Pollution.

## Guidance and Relevant Technical Standards

The following guidance and technical standards have informed this assessment:

- Planning Advice Notes (PANs) and Specific Advice Sheets, published by the Scottish Government of relevance to this assessment, including;
  - PAN 61 Planning and Sustainable Urban Drainage Systems; and,
  - Online Planning Advice on Flood Risk (which supersedes PAN 69).
- SEPA Pollution Prevention Guidance Notes (PPG) and Guidance of Pollution Prevention (GPP):
  - GPP01: Understanding your environmental responsibilities – good environment practices;
  - GPP02: Above ground oil storage;
  - PPG03: Use and design of oil separators in surface water drainage systems;
  - GPP05: Works and maintenance in or near water;
  - PPG06: Working at construction and demolition sites;
  - PPG07: Safe storage - the safe operation of refuelling facilities;
  - GPP08: Safe storage and disposal of used oils;
  - GPP13: Vehicle washing and cleaning;
  - GPP21: Pollution incident response plans; and,
  - GPP22: Dealing with spills.
- CIRIA publications:

- C532 Control of Water Pollution from Construction Sites (2001);
- C741 Environmental Good Practice on Site (2015); and,
- C753 The SUDS Manual (2015).
- SEPA publications
  - Engineering in the Water Environment: Good Practice Guide – Sediment Management (2010);
  - Groundwater Protection Policy for Scotland, Version 3 (2009);
  - Regulatory Position Statement, Developments on Peat (2012); and,
  - Land Use Planning System Guidance Note 31, Version 3 – Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (2017).

### 7.3 Methodology

The potential effects associated with the proposed development on geology, hydrology and hydrogeology have been assessed by completing an initial desk study followed by an impact assessment. Characterisation of baseline conditions and the impact assessment have been informed by a programme of site investigation.

#### Consultation

The scope of the assessment has been determined through a combination of professional judgement, reference to relevant guidance documents and consultation with stakeholders through a formal EIA scoping process. [Table 7.1](#) summarises the scoping and consultation responses relevant to this chapter and provides information on where and / or how points raised have been addressed in this assessment.

The Scoping Report and Scoping Opinion can be found at [Appendix 4.1](#) and [4.2](#).

Table 7.1: Consultation and Scoping Responses

Consultee	Response	Comment
Scottish Water Scoping Response (9 December 2022)	<p>Scottish Water has no objection to this planning application.</p> <p>The proposed activity falls within a drinking water catchment where a Scottish Water abstraction is located. Loch Ness supplies Invermoriston Water Treatment Works (WTW) and it is essential that water quality and water quantity in the area are protected. It is a relatively large catchment and the activity is sufficient distance from the intake that it is likely to be low risk, however there are a lot of other developments and activities taking place in this catchment and therefore water quality mitigation measures will be required to minimise risk to water quality.</p> <p>Scottish Water will not accept any surface water connections into our combined sewer system.</p>	<p>Noted.</p> <p>Mitigation measures to protect the Drinking Water Protected Area are discussed in <a href="#">Section 7.5</a>.</p>
Scottish Environment Protection Agency (SEPA)	Clear plans of what permanent and temporary works are proposed should be provided.	See Volume 1 Technical Figures 3.1 to 3.3

Consultee	Response	Comment
<p>Scoping Response (6 January 2023)</p>	<p>SEPA note that are generally content with the scoping understanding that:</p> <ul style="list-style-type: none"> <li>■ impacts on existing groundwater abstractions will be adequately covered by a separate Private Water Supplies assessment;</li> <li>■ information will be provided separately on engineering impacts on the water environment; and</li> <li>■ water management is being scoped out.</li> </ul> <p>Information should be provided on new permanent and temporary watercourse crossing (including those that are replacements), all of which should follow best practice guidance.</p> <p>Information should be provided to support the decision to scope out peat from the assessment.</p> <p>Note SEPA are content with Phase 1 habitat survey which should include NVC survey in any areas of wetland. Mitigation should be provided to maintain hydrology pathways where impacts on groundwater dependant terrestrial ecosystems cannot be avoided (such as where the temporary road needs to cross linear habitats) and temporary works such as laydown areas and construction compounds should be shown to avoid these types of wetlands.</p>	<p>Details of private water supplies are summarised in <a href="#">Section 7.4</a> and fully assessed in <a href="#">Appendix 7.2</a>.</p> <p>See <a href="#">Appendix 7.1</a>.</p> <p>See <a href="#">Section 7.4</a>.</p> <p>See <a href="#">Section 7.4</a>.</p>
<p>NatureScot Scoping Response (9 January 2023)</p>	<p>The road upgrade is 200m from South Laggan Fen Site of Special Scientific Importance (SSSI) notified for transition open fen. There are natural heritage interests of national importance on the site, but these will not be affected by the proposal.</p> <p>NatureScot are content with the proposed scope of survey and assessment.</p>	<p>Noted.</p>
<p>THC Scoping Response (18 January 2023)</p>	<p>The EIAR should include a full assessment on the impact of the development on the water environment. SEPA, Environmental Health, NatureScot and the Flood Risk Management Team are generally content with the scope of the assessment and supporting information which will be provided.</p> <p>The EIAR should fully describe the likely significant effects of the development on the local geology including aspects such as construction compounds, earthworks, site restoration and the soil generally including direct effects and any indirect. Proposals should demonstrate construction practices that help minimise the use of raw materials and maximise the use of secondary aggregates and recycled or renewable materials.</p> <p>The EIAR needs to address the nature of the hydrology and hydrogeology of the site, and of the potential</p>	<p>Noted.</p> <p>See <a href="#">Section 7.4</a>.</p> <p>See <a href="#">Section 7.4</a>.</p>

Consultee	Response	Comment
	<p>impacts on watercourses, water supplies including private supplies, water quality, water quantity and on aquatic flora and fauna. Measures to prevent erosion, sedimentation or discolouration will be required, along with monitoring proposals and contingency plans. Assessment will need to recognise periods of high rainfall which will impact on any calculations of runoff, high flow in watercourses and hydrogeological matters.</p> <p>The EIAR is expected to identify all watercourse crossings and include a systematic table of watercourse crossings, which should include photographs and dimensions of the watercourse.</p> <p>The need for, and information on, abstractions of water supplies for concrete works or other operations should also be identified. The EIAR should identify whether a public or private source is to be utilised. If a private source is to be utilised, full details on the source and details of abstraction need to be provided.</p> <p>The applicant will be required to carry out an investigation to identify any private water supplies, including pipework, which may be adversely affected by the development and to submit details of the measures proposed to prevent contamination or physical disruption. Highland Council has some information on known supplies but it is not definitive. An on-site survey will be required.</p> <p>The Council's Flood Risk Management Team have no comment on the scope of the proposed assessment in relation to flood risk and drainage.</p> <p>Where there is demonstrable requirement for peat landslide hazard and risk assessment (PLHRA), the assessment should be undertaken as part of the EIA process to the determining authority with a clear understanding of whether risks are acceptable and capable of being controlled by mitigation measures.</p>	<p>See <a href="#">Appendix 7.1</a>.</p> <p>See <a href="#">Section 7.4</a>.</p> <p>Details of private water supplies are summarised in <a href="#">Section 7.4</a> and fully assessed in <a href="#">Appendix 7.2</a>.</p> <p>Noted.</p> <p>See <a href="#">Section 7.4</a>.</p>

## Study Area

The study area encompasses the areas over which all desk based, and field data were gathered to inform the assessment presented in this Chapter. The study area comprises a 500m buffer to the site boundary.

### Desk Top Study

An initial desk study has been undertaken to determine and confirm baseline characteristics by reviewing available information on soils, geology, hydrology and hydrogeology. The following sources of information have been consulted in order to characterise the baseline conditions of the site and study area:

- Ordnance Survey (OS) 1:50,000 and 1:25,000 scale mapping;

- National Library of Scotland, Historic Ordnance Survey (OS) mapping;
- Natural England MAGIC map;
- NatureScot SiteLink;
- James Hutton Institute, Soil map of Scotland (partial cover) (1:25,000);
- British Geological Survey (BGS) Onshore GeoIndex (1:50,000);
- BGS Hydrogeological Map of Scotland;
- SEPA flood maps;
- SEPA environmental data;
- Scottish Natural Heritage (SNH) (now NatureScot), Carbon and peatland 2016 map; and,
- Data requests to SEPA and the THC (February 2023).

### **Fieldwork**

A site visit and walkover survey was completed in July 2023 and was undertaken to:

- Verify the information collected during the desk and baseline study;
- Allow appreciation of the study area and undertake visual assessment of ground conditions and hydrology relative to the proposed development; and,
- Visit the proposed watercourse crossings to inform the watercourse crossing assessment.

## **Approach to Assessment**

### **Sensitivity of Receptor**

The sensitivity of the receiving environment (i.e., the baseline quality of the receiving environment) is defined as its ability to absorb an effect without a detectable change and can be considered through a combination of professional judgement and a set of pre-defined criteria which is set out in **Table 7.2**. Receptors in the receiving environment only need to meet one of the defined criteria to be categorised at the associated level of sensitivity.

Table 7.2: Sensitivity of Receptor

Sensitivity	Definition
High	<ul style="list-style-type: none"> <li>• soil type and associated land use is highly sensitive (e.g. unmodified blanket bog or peatland);</li> <li>• SEPA Water Framework Directive Water Body Classification: High-Good or is close to the boundary of a classification: Moderate to Good or Good to High;</li> <li>• receptor is of high ecological importance or National or International value (e.g. Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), habitat for protected species) which may be dependent upon the hydrology of the Development Area;</li> <li>• receptor is at high risk from flooding above 0.5% Annual Exceedance Probability (AEP) now or in the future (2085) and/or water body acts as an active floodplain or flood defence;</li> <li>• receptor is used for public and/or private water supply (including Drinking Water Protected Areas; and</li> </ul>

Sensitivity	Definition
	<ul style="list-style-type: none"> <li>groundwater vulnerability is classified as High.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>soil type and associated land use moderately sensitive (e.g. arable, commercial forestry);</li> <li>SEPA Water Framework Directive Water Body Classification: Moderate or is close to the boundary of a classification: Low to Moderate;</li> <li>receptor is at moderate risk from flooding (0.1% AEP to 0.5% AEP) now or in the future (2085) but does not act as an active floodplain or flood defence; and,</li> <li>moderate classification of groundwater aquifer vulnerability.</li> </ul>
Low	<ul style="list-style-type: none"> <li>soil type and associated land use not sensitive to change in hydrological regime and associated land use (e.g. intensive grazing of sheep and cattle);</li> <li>SEPA Water Framework Directive Water Body Classification: Poor or Bad;</li> <li>receptor is at low risk from flooding (less than 0.1% AEP) now or in the future (2085); and,</li> <li>receptor not used for water supplies (public or private).</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>receptor would not be affected by the proposed development e.g. lies within a different and unconnected hydrological / hydrogeological catchment.</li> </ul>

## Magnitude of Change

The potential magnitude of change would depend upon whether the potential effect would cause a fundamental, material or detectable change. In addition, the timing, scale, size and duration of the potential change resulting from the proposed development are also determining factors. The criteria that have been used to assess the magnitude of change are defined in [Table 7.3](#).

Table 7.3: Magnitude of Change

Magnitude	Criteria	Definition
Major	Results in a loss of attribute	<p>Fundamental (long term or permanent) changes to the baseline soils, geology, hydrology, hydrogeology and water quality such as:</p> <ul style="list-style-type: none"> <li>permanent degradation and total loss of soils, peatland habitat or protected geological features;</li> <li>wholesale changes to watercourse channel, route, hydrology or hydrodynamics;</li> <li>changes to the site resulting in an increase in runoff with flood potential and also significant changes to erosion and sedimentation patterns;</li> <li>major changes to the water chemistry; and,</li> <li>major changes to groundwater levels, flow regime and risk of groundwater flooding.</li> </ul>
Moderate	Results in impact on integrity of attribute or loss	<p>Material but non-fundamental and short to medium term changes to baseline soils, geology, hydrology, hydrogeology and water quality, such as:</p> <ul style="list-style-type: none"> <li>loss of extensive areas of soils or peat habitat, damage to important geological structures / features;</li> </ul>



Magnitude	Criteria	Definition
	of part of attribute	<ul style="list-style-type: none"> <li>• some fundamental changes to watercourses, hydrology or hydrodynamics;</li> <li>• changes to site resulting in an increase in runoff within system capacity;</li> <li>• moderate changes to erosion and sedimentation patterns;</li> <li>• moderate changes to the water chemistry of surface runoff and groundwater; and,</li> <li>• moderate changes to groundwater levels, flow regime and risk of groundwater flooding.</li> </ul>
Minor	Results in minor impact on attribute	<p>Detectable but non-material and transitory changes to the baseline soils, geology, hydrology, hydrogeology and water quality, such as:</p> <ul style="list-style-type: none"> <li>• minor or slight loss of soils, peatland or slight damage to geological structures / features;</li> <li>• minor or slight changes to the watercourse, hydrology or hydrodynamics;</li> <li>• changes to site resulting in slight increase in runoff well within the drainage system capacity;</li> <li>• minor changes to erosion and sedimentation patterns;</li> <li>• minor changes to the water chemistry of surface runoff and groundwater; and,</li> <li>• minor changes to groundwater levels, flow regime and risk of groundwater flooding.</li> </ul>
Negligible	Results in an impact on attribute but of insufficient magnitude to affect the use / integrity	<p>No perceptible changes to the baseline soils, geology, hydrology, hydrogeology and water quality such as:</p> <ul style="list-style-type: none"> <li>• no impact or alteration to existing important soils, peatland or geological environs;</li> <li>• no alteration or very minor changes with no impact to watercourses, hydrology, hydrodynamics, erosion and sedimentation patterns;</li> <li>• no pollution or change in water chemistry to either groundwater or surface water; and,</li> <li>• no alteration to groundwater recharge or flow mechanisms.</li> </ul>

## Significance of Effect

The sensitivity of a receptor together with the magnitude of the change determines the significance of the effect, which can be categorised into level of significance as identified in [Table 7.4](#). This also considers good practice measures implemented and embedded as part of the design and construction of the proposed development and use of professional judgement where appropriate.

[Table 7.4](#) provides a guide to assist in decision making. However, it should not be considered as a substitute for professional judgment and interpretation. In some cases, the potential sensitivity of the receiving environment or the magnitude of potential change cannot be



quantified with certainty and, therefore, professional judgement remains the most robust method for identifying the predicted significance of a potential effect.

Effects of ‘Major’ or ‘Moderate’ significance are considered to be ‘significant’ in terms of the EIA Regulations.

Table 7.4: Significance of Effect

Magnitude of Change	Sensitivity of Receptor			
	High	Medium	Low	Negligible
Major	Major	Major	Moderate	Negligible
Moderate	Moderate	Moderate	Minor	Negligible
Minor	Moderate	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

## Assumptions and Limitations

The assessment uses site investigation, survey data and publicly available data sources explained at sections 7.3.5 and 7.3.6, including but not limited to SEPA, BGS, THC and commercial data supply companies, as well as additional information supplied from stakeholders during the scoping and consultation stages.

It is considered that the data and information used to complete this assessment is robust and that there are no significant data gaps or limitations.

## Baseline Conditions

### Site Setting

The proposed development is located to the north of Loch Lochy, approximately 350m west of Laggan. The proposed development comprises an upgrade of the existing Kilfinnan Road from approximately Grid Reference (NGR) NN 30018 98604 near the A82 to NN 27077 95213 south east of Kilfinnan Wood.

Ground elevations vary from approximately 40m Above Ordnance Datum (AOD) near the A82 to 80m AOD within the western extent of the site.

### Designated Sites

A review of the NatureScot Sitelink (NatureScot, 2023) and Magic Map (DEFRA, 2023) webpages highlights that there are no statutory designated sites within the site.

The locations of nearby statutory designated sites are shown on **Figure 7.1**. One designated site is recorded within the Study Area:

- South Laggan Fen Site of Specific Scientific Interest (SSSI) lies approximately 160m south east of the site, on the opposite (south) side of the Caledonian Canal. The SSSI is designated for transition open fen wetland habitats. The SSSI is located within a different water catchment to the proposed development and is not hydraulically connected to the proposed development and therefore not considered further in this assessment.

No other designated sites are noted within 500m of the proposed development.

## Soils and Geology

### Soils

An extract of the Soil map of Scotland (1:25,000 scale) is presented as **Figure 7.2** which shows that soils beneath the proposed development generally comprise brown soils and mineral podzols.

### Superficial Deposits (Including Peat)

The BGS Onshore Geoindex (see **Figure 7.3**) indicates that the study area is underlain by glaciofluvial deposits to the east and hummocky glacial deposits to the west and south. Alluvial fan deposits are noted within the southern extent of the site and to bound the outflow of the Kilfinnan Burn to Loch Lochy. No peat deposits are shown within the site boundary or within the study area.

An extract of the peatland classification dataset published by Scottish Natural Heritage (now NatureScot) is shown on **Figure 7.4**. This shows that the entirety of the site lies within mineral soils where peatland habitats are not typically found.

### Bedrock Geology and Linear Features

An extract of the regional BGS bedrock geological mapping is presented in **Figure 7.5** which shows the site to be underlain entirely by the Great Glen fault zone comprising of cataclasite.

Several inferred faults are noted within the study area with a south west to north east trend.

## Hydrogeology

### Aquifer Characteristics and Groundwater Vulnerability

An extract of the BGS 1:625,000 scale Hydrogeological Map of Scotland and 1:100,000 scale Aquifer Productivity and Groundwater Vulnerability datasets are presented in **Figure 7.6** and **Figure 7.7** respectively.

A review of **Figure 7.6** confirms that the bedrock deposits are considered to be a low productivity aquifer whereby small amounts of groundwater may be present in near surface weathered zones and secondary fractures.

The Aquifer Productivity and Groundwater Vulnerability (**Figure 7.7**) datasets classify the underlying aquifer (superficial and bedrock) according to the predominant groundwater flow mechanism (fracture or intergranular) and the estimated groundwater productivity. Groundwater vulnerability is divided into five classes (1 to 5) with 1 being least vulnerable and 5 being most vulnerable.

**Figure 7.7** indicates that the hummocky glacial superficial deposits are not classified as a significant aquifer. The glaciofluvial and alluvial fan deposits are classified as a moderate to high productivity aquifers which are characterised by intergranular groundwater movement. Given the proximity of these deposits with Loch Lochy and Caledonian Canal, the groundwater within these deposits is likely to be shallow and in hydraulic conductivity with these waterbodies.

The bedrock aquifer is shown to be a very low productivity aquifer generally without groundwater except at shallow depth with flow almost entirely through fractures and other discontinuities.

The majority of the site is shown to be underlain by groundwater vulnerability Classes 5 to 4a. An area of lower vulnerability (3) is noted within the central part of the site, where hummocky glacial deposits are recorded on the BGS maps. The highest vulnerability is noted where little or no superficial deposits are recorded, and thus where there is little attenuation of potential pollutants prior to entry to groundwater.

### **Groundwater Levels and Quality**

Groundwater recharge at and surrounding the site is limited by the following factors:

- Steeper topographic gradients will result in rainfall forming surface water runoff; and,
- The underlying bedrock (where not weathered or fractured) generally displays a low permeability that limits groundwater recharge and prevents large scale storage and movement of the groundwater.

SEPA do not maintain any groundwater level monitoring locations within the Study Area. In the absence of published information or data held by SEPA, it is anticipated that groundwater will be present as perched groundwater within the more permeable horizons of the hummocky glacial deposits and within the glaciofluvial and alluvial fan deposits.

All of Scotland's groundwater bodies have been designated as Drinking Water Protected Areas under the Water Environment (Drinking Water Protected Area) (Scotland) Order 2013 and require protection for their current use or future potential as drinking water resources.

The current status of groundwater bodies in Scotland has been classified by SEPA in accordance with the requirements of the Water Framework Directive (WFD). SEPA identify two groundwater bodies beneath the site:

- Northern Highlands (SEPA ID: 150701) groundwater body, was classified in 2020 with an Overall Status of Good and no pressures are identified; and,
- Fort William (SEPA ID: 150696) groundwater body, was classified in 2020 with an Overall Status of Good and no pressures are identified.

### **Groundwater Dependent Terrestrial Ecosystems (GWDTEs)**

Potential GWDTE were identified as part of the NVC survey completed for the previous Coire Glas Pumped Storage Scheme EIAR. Areas of potentially highly and moderately groundwater dependent habitats were recorded within the study area, however, it was determined, based on the particular species assemblages (indicative of mineral enrichment which can be associated with groundwater) in locations where bedrock is exposed to the surface, that the GWDTE were supported by surface water runoff and rainfall, rather than groundwater, given the geological and hydrogeological setting of the site.

Buffers to areas of potential GWDTE specified in SEPA guidance therefore do not apply, but safeguards to sustain these habitats, and the sources of water to these habitats, will be needed during construction and operation of the proposed development. This is discussed further in [Section 7.5](#).

## **Hydrology**

### **Local Hydrology**

The site is located within two main surface water catchment areas: Loch Lochy to the south and Loch Oich and the Caledonian Canal to the north. Numerous minor watercourses cross the site and drain into the lochs including the following named watercourses:

- The Allt Cruinneachaid which flows south eastwards within the northern of the site before discharging into the Caledonian Canal;
- The Allt an Oighre which flows south eastwards within the northern extent of the site before discharging into the Caledonian Canal; and,
- The Allt a' Choire Ghlais also referred to as the Kilfinnan Burn which also flows south eastwards within the southern extent of the site before discharging into Loch Lochy.

Flood water flows in the Allt a' Choire Ghlais (Kilfinnan Burn) have been subject to assessment and are reported in [Appendix 7.1](#).

The site lies within the Loch Ness DWPA (see [Table 7.2](#)). It is considered further in this assessment.

One further DWPA is noted within the Study Area associated with the Allt na Herrie surface water catchment which is located approximately 250m south east of the site on the opposite side of Caledonian Canal. The DWPA is not hydraulically connected to the proposed development and therefore not considered further.

### **Rainfall and Surface Water Flow**

SEPA provided precipitation data for a precipitation gauge maintained at Braeroy Lodge Gauging Station (located at NGR NN 33690 91550, at an elevation of approximately 230m AOD and situated approximately 7.2km south east of the proposed development). In 2022, a total precipitation of 2,109 mm was recorded.

The watercourses at the site will exhibit a relatively flashy response to rainfall; the low permeability soils and geology and comparatively steep gradients will result in a rapid response (rise) in flows in the watercourses during storm events.

### **Surface Water Quality**

Water quality of the Allt a Choire Ghlais (Kilfinnan Burn), Loch Lochy, Loch Oich and the Caledonian Canal are monitored by SEPA and classified annually in accordance with the requirements of the WFD. Table 7.57.5 summarises classifications reported in 2020 (the last reporting cycle).

Smaller watercourses within the proposed development are not monitored nor classified by SEPA.

Table 7.5: Surface Water Classification Data

<b>Watercourse</b>	<b>Overall Status</b>	<b>Overall Ecology</b>	<b>Physico-Chemical Status</b>	<b>Hydro-morphology</b>
Allt a Choire Ghlais (20341)	Moderate	Moderate	Good	Moderate
Caledonian Canal (23400)	Good Ecological Potential	No Information	No Information	No Information
Loch Oich (100188)	Good	Good	High	Good
Loch Lochy (100194)	Good Ecological Potential	Poor	Good	Poor

### **Fisheries**

Fisheries locally are managed by Lochaber Fisheries Trust in conjunction with Lochaber District Fisheries Board as well as the Ness and Beaully Fisheries Trust in combination with Ness District Salmon Fishery Board.

### **Flood Risk Assessment**

SEPA has developed national flood maps that present modelled flood extents for river, coastal, surface water and groundwater flooding. The river, coastal, surface water and groundwater maps were developed using a consistent methodology to produce outputs for the whole of Scotland, supplemented with more detailed, local assessments where available and suitable for use. Flood extents are presented in three likelihoods:

- High likelihood: A flood event is likely to occur in the defined area on average more than once in every ten years (1:10) or a 10% chance of happening in any one year;

- Medium likelihood: A flood event is likely to occur in the defined area on average more than once in every two hundred years (1:200) or a 0.5% chance of happening in any one year; and,
- Low likelihood: A flood event is likely to occur in the defined area on average more than once in every thousand years (1:1000) or a 0.1% chance of happening in any one year.

The flood risk from each of these potential sources is discussed in [Table 7.6](#).

Table 7.6: Potential Flood Risk

Potential Source	Potential Risk to the Site	Justification
Coastal Flooding	No	SEPA flood maps confirms that no tidal flooding is expected at the site now or in the future. The lowest elevations at the site are approximately 40m AOD and the proposed development is remote from the coast. The site is therefore not considered to be at risk of tidal flooding.
Fluvial Flooding	Yes	SEPA flood maps confirm that the majority of the site is not at risk from fluvial flooding now or in the future except where the proposed development crosses the Kilfinnan Burn. The proposed watercourse crossings are shown in <a href="#">Appendix 7.1</a> and new crossings will be designed to ensure safe access and egress is maintained throughout the construction and operation of the proposed development. This will ensure that that the proposed crossings will not pose a restriction to flood water flows or increase flood risk. A new bridge over the Kilfinnan Burn has been designed to accommodate a low likelihood event without overtopping, details of which are appended to <a href="#">Appendix 7.1</a> It is therefore considered that the proposed development is not at risk from fluvial flooding subject to adaptation of good practice measures which are discussed in <a href="#">Section 7.5</a> .
Surface Water Flooding	Yes (Minor)	SEPA has identified several areas of surface water flood risk across the site which generally coincide with the watercourse corridors within the site. Flood extents outside of the watercourse corridors are shown to be small, localised areas, never forming large, linked areas or flow paths. Therefore, surface water is not considered a development constraint.
Groundwater Flooding	No	A desk-based review of the site showed that the site lies above a low productivity aquifer whereby limited groundwater is anticipated. In addition, a review of the SEPA groundwater flood map shows that the site is not at risk from groundwater flooding.
Flooding from Infrastructure Failure	Yes	SEPA has produced reservoir inundation maps for those sites currently regulated under the Reservoirs (Scotland) Act 2011. Review of the SEPA mapping highlights that there is a risk of reservoir inundation within the study area from Invergarry Reservoir, Loch Oich Reservoir, Loch Treig and Quoich Reservoir. It is noted that the majority of the proposed development would be out width an area shown at risk, with the exception of the northern extent of the site near the Caledonian Canal and the A82. The likelihood of such an event is very unlikely The proposed development lies downstream of the proposed Coire Glas upper reservoir. This will be subject to routine inspection as required by the Reservoirs Act and regulated by

		a Controlled Activity Regulations authorisation, and therefore flood risk from this source is mitigated and not considered further in this assessment.
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## Private Water Supplies

As part of this assessment, a data request was made to THC for details of Private Water Supplies (PWS) sources within the Study Area. This has been supplemented with information collected by the Applicant. The risk the proposed development poses to PWSs has been considered as part of this assessment and is presented in [Appendix 7.2: PWSRA](#). It confirms that:

- Four PWSs sources are potentially at risk from the proposed development;
- Five distribution pipes associated with PWS sources are potentially at risk from the proposed development; and,
- Three PWS sources are not at risk from the proposed development.

[Appendix 7.2: PWSRA](#) confirms the measures that are required to safeguard these PWS and presents a monitoring schedule which can be used to confirm that the PWSs are not impaired should the proposed development be granted planning permission.

SEPA has provided records of Controlled Activity Regulation (CAR) authorisations within the study area (see [Figure 7.1](#)). A total of 10 authorisations are recorded within the proposed development area or potentially downstream of the proposed development and in summary include:

- 7 private sewage discharges;
- 1 impoundment and one abstraction for private water supply near Kilfinnan Lodges and Kilfinnan Compound respectively; and,
- 1 authorisation near Laggan Locks where the activity is unknown.

## Summary of Sensitive Receptors

[Table 7](#) outlines the receptors identified as part of the baseline study, and their sensitivity based upon the criteria contained in [Table 7.2](#). These receptors form the basis of the assessment, and as per the previously introduced methodology, are used in conjunction with an estimate of the magnitude of an effect to determine significance.

Table 7.7: Sensitivity of Identified Receptors

Receptor	Sensitivity	Reason for Sensitivity
Statutory Designated Sites	Negligible	South Laggan Fen SSSI lies within the Study Area, however it is located within a different surface water catchment than the proposed development and therefore not considered at risk from the proposed development. It is not considered further.
Soils and Geology	Negligible	Best practice management techniques will be used to handle and store soils temporarily moved by the proposed development (see Section 7.5). The superficial and bedrock geology is common regionally and has no specific rarity value. No deposits of peat have been recorded within the Study Area. It is not considered further.
Groundwater	High	Groundwater beneath the site has been classified as Good and vulnerability is classified as High. All of Scotland's groundwater bodies have been designated as DWPA's.
GWDTE	High	Areas of potential GWDTE have been identified by NVC mapping. It has been shown that the habitats are not

Receptor	Sensitivity	Reason for Sensitivity
		sustained by groundwater but by surface water. Measures will be required to sustain existing surface water flow paths to these habitats.
Surface Water	High	Watercourses that drain the site have been classified by SEPA as Good to Moderate overall status.
Flooding	Medium	Floodplains have been identified adjacent to the Kilfinnan Road which is crossed by the Proposed Development.
Private Water Supplies	High	Several PWSs sources have been identified down gradient of the proposed development or the pipework which connects the source to the property is crossed by the proposed development.
Licensed Sites	High	One licensed abstraction has been recorded within the proposed development area.

## 7.4 Embedded Mitigation

Mitigation has been developed as the project design has progressed and has included avoiding areas considered ecologically and hydrologically sensitive, other than where these are unavoidable, such as crossing of watercourses.

In addition to the embedded mitigation in the design, best practice construction measures have been developed to ensure that the disturbance and pollution during construction is avoided. Embedded mitigation and mitigation by design relevant to the geology and water environment are presented in the sections below.

### Good Practice Measures

As a principle, preventing the release of any pollution / sedimentation is preferable to dealing with the consequences of any release. There are several general measures which cover all effects assessed within the Chapter, details of which are given below.

The proposed development will be developed in accordance with good practice guidance, including UK and Scottish guidance on good practice for construction projects detailed earlier in this Chapter.

### Construction Environment Management Plan (CEMP)

A contractual management requirement of the successful Principal Contractor would be the development and implementation of a comprehensive and site-specific CEMP, the submission of which will be a conditioned requirement attached to the planning permission. This document would detail how the Principal Contractor would manage the works in accordance with all commitments and mitigation detailed in the EIA Report, statutory consents and authorisations, and industry best practice and guidance, including pollution prevention guidance.

The CEMP will also include refined / updated volumes of soil being excavated and where and how this will be reused within the site as a result of finalising the detailed site design.

The CEMP will also outline measures to ensure that the works minimise the risk to groundwater and surface water.

It is expected that the following will be included in the CEMP to ensure the works are undertaken in accordance with good practice guidance, which includes, but is not limited to the following:

- Any above ground on-site fuel and chemical storage would be bunded;
- Emergency spill response kits would be maintained during the construction works;



- A vehicle management system would be put in place wherever possible to reduce the potential conflicts between vehicles and thereby reduce the risk of collision;
- A speed limit would be used to reduce the likelihood and significance of any collisions;
- Drip trays will be placed under vehicles which could potentially leak fuel / oils;
- Any water contaminated with silt or chemicals will not be discharged directly or indirectly to a watercourse without prior treatment; and,
- Water for temporary site welfare facilities will be brought to site, and foul water will be collected in a tank and collected for offsite disposal at an appropriately licensed facility.

A wet weather protocol would be developed. This would detail the procedures to be adopted by all staff during periods of heavy rainfall. Tool box talks would be given to engineering / construction / supervising personnel. Roles would be assigned, and the inspection and maintenance regimes of sediment and runoff control measures would be adopted during these periods.

In extreme cases, the above protocol would dictate that work onsite may have to be temporarily suspended until weather or ground conditions allow.

### **Environmental Clerk of Works**

To ensure all reasonable precautions are taken to avoid negative effects on the soils and water environment, a suitably qualified Environmental Clerk of Works ('ECoW') will be appointed prior to the commencement of construction to advise the Applicant and the Principal Contractor on all ecological and hydrological matters. The ECoW will be required to be present onsite during the construction phase and will carry out monitoring of works and briefings with regards to any ecological and hydrological sensitivities on the site to the relevant staff of the Principal Contractor and subcontractors.

With respect to the water environment, the ECoW would also have responsibility to ensure water flow paths and quality to water dependant habitats are sustained during all phases of the proposed development.

The appointment of an EcoW will be a conditional requirement attached to the planning permission.

### **Safeguarding of Soils**

The soil (topsoil and sub-soil) would be excavated from the footprint of permanent works during the construction phase, kept on site and used for landscaping the shoulders of the improved road.

Soils beneath areas of temporary tracks and compounds will be carefully excavated and stockpiled adjacent to the temporary works so that the soils can be replaced when the temporary works are removed. Topsoil and subsoil will be stored in separate stockpiles so that they are not mixed and can be replaced in the same order they were excavated.

Particular care will be taken, in accordance with best practice, not to over compact soils.

Subject to best practice with regard to stripping, handling and placement of soils they can be safeguarded and the policy aims of NPF4 met.

The proposed development will be subject to further detailed design development prior to construction that will include geotechnical analysis to ensure the stability of all elements of the proposed development.

### **Water Quality Monitoring (including PWS)**

Water quality monitoring before and during the construction phase would be undertaken for surface water catchments and of water sources which have been identified as potentially at risk

from the proposed development without implementation of best practice measures (see [Appendix 7.2](#)).

The monitoring would be used to ensure that the quality and/or quantity of water to these sources is not significantly impacted. Monitoring would be carried out at a specified frequency and an example monitoring protocol is given in [Appendix 7.2](#).

This monitoring would continue throughout the construction phase and immediately post construction when works are undertaken near a water source. Monitoring would be used to allow a rapid response to any pollution incident and also to assess the impact of good practice or remedial measures. Monitoring frequency would increase during the construction phase if remedial measures to improve water quality were implemented. Water quality monitoring plans would be developed during detailed design and Scottish Water, SEPA, NatureScot, THC, Marine Science Scotland, and local fisheries boards would be consulted on the plan which would be contained within the CEMP.

### **Groundwater Dependent Habitats**

SEPA's guidance states that an NVC survey should be undertaken to identify wetland areas that might be dependent on groundwater. If potential GWDTE are identified, then it is necessary to assess how the potential GWDTE may be affected by the proposed development.

It has been shown that areas identified as being potentially highly or moderately groundwater dependent are likely to be sustained by incident rainfall and local surface water runoff rather than by groundwater. Accordingly, the buffers proposed in SEPAs GWDTE guidance need not apply.

Measures, such as permeable temporary access tracks and regular cross track/highway drains, have been proposed to safeguard existing water flow paths and maintain existing water quality. It is considered therefore that the water dependent habitats identified by the NVC mapping can be sustained. This would be confirmed, in accordance with good practice, by the Environmental Clerk of Works (ECoW) at the time of the construction who would ensure existing surface water flow paths and water flushes are maintained.

### **Pollution Risk**

Good practice measures in relation to pollution prevention would include the following:

- Refuelling would take place at least 50 m from watercourses;
- Foul water generated onsite would be managed in accordance with PPG4;
- Areas would be designated for washout of vehicles which are a minimum distance of 50 m from a watercourse;
- Washout water would also be stored in the washout area before being treated and disposed of;
- If any water is contaminated with silt or chemicals, runoff would not enter a watercourse directly or indirectly prior to treatment;
- Water would be prevented as far as possible, from entering excavations such as trenches and foundations (for example associated with watercourse crossings);
- Procedures would be adhered to for storage of fuels and other potentially contaminative materials in line with the Controlled Activity Regulations, to minimise the potential for accidental spillage; and,
- A plan for dealing with spillage incidents would be designed prior to construction, and this would be adhered to should any incident occur, reducing the effect as far as practicable. This would be included in the final CEMP for the proposed development.

### **Erosion and Sedimentation**

Good practice measures for the management of erosion and sedimentation would include the following:

- A 50m buffer will be maintained between working areas, machinery and watercourses in all areas except at watercourse crossing points (any buffer zones less than 50m require authorisation from the ECoW, the minimum buffer zone is 20m). Buffer zones will be demarcated, where necessary, by the ECoW.;
- Water would be prevented, as far as possible, from entering excavations through the use of appropriate cut-off drainage (e.g. at watercourse crossings);
- Where the above is not possible, water would pass through silt / sediment traps to remove silt prior to discharge into the surrounding drainage system;
- Clean and dirty water onsite would be separated, and dirty water would be filtered before entering the water environment;
- Silt fences would be deployed as required to reduce sediment transport;
- The amount of ground exposed, and time period during which it is exposed, would be kept to a minimum;
- Silt / sediment traps, single size aggregate, geotextiles or straw bales would be used to filter any coarse material and prevent increased levels of sediment. Further to this, activities involving the movement or use of fine sediment would avoid periods of heavy rainfall where possible; and,
- The ECoW and the Principal Contractor would carry out regular visual inspections of watercourses to check for suspended solids in watercourses downstream of work areas.

### **Flood Risk and Drainage**

It is proposed to adopt Sustainable Drainage Systems (SuDS) as part of the proposed development. SuDS techniques aim to mimic pre-development runoff conditions and balance or throttle flows to the rate of runoff that might have been experienced prior to development. It is proposed as part of the detailed site design, as of which will be subject to conditions. The principles and size(s) of the attenuation measures provided onsite would be agreed with THC. Good practice in relation to the management of surface water runoff rates and volumes would include the following:

- Drainage systems would be designed to ensure that any sediment, pollutants or foreign materials which may cause blockages are removed before water is discharged into a watercourse;
- Onsite drainage would be subject to routine checks to ensure that there is no build-up of sediment or foreign materials which may reduce the efficiency of the original drainage design causing localised flooding;
- Appropriate drainage would attenuate runoff rates and reduce runoff volumes to ensure minimal effect upon flood risk; and,
- Where necessary, check dams would be used in order to prevent trenches developing into preferential flow pathways.

### **Watercourse Crossings**

A schedule and assessment of existing and new watercourse crossings is included in [Appendix 7.1](#).

Good practice in relation to new water crossings involves the following:

- Where practicable bottomless arch culverts and/or bridging solutions would be used;

- The design of the watercourse crossings would be agreed with SEPA prior to construction and be regulated in accordance with CAR;
- The appropriate crossing type would be identified from SEPA's good practice guidance and would consider any ecological and hydrological constraints; and,
- The crossing would be sized and designed so as to minimise effect upon flood risk (sized to accommodate at least the 200 year flow or sized to ensure access and egress is maintained in times of flood).

A new bridge over the Kilfinnan Burn has been designed to accommodate a low likelihood (1 in 1000 year) event without overtopping, details of which are appended to [Appendix 7.1](#).

### **Decommissioning of Temporary Tracks and Compounds**

Following use of temporary tracks, compounds and associated watercourse crossings, it is proposed that they are removed, and the stockpiled soils carefully replaced to reinstate the ground where the tracks were.

Stone used to form the running surface of the temporary tracks would be removed and taken from site and recycled where possible. Any geofabric (or similar) beneath the stone would also be removed and reused if possible. If no reuse was possible then the geofabric would be disposed of at an appropriately licensed facility.

Soils would be replaced in the same order they were excavated, e.g. the deepest soils first and then the topsoil. Any vegetation turves which were safeguarded during construction of the tracks would then be placed on top of the restored soils.

All restoration works would be supervised by the project specific ECoW and where necessary and directed temporary erosion protection measures (such as silt fencing and hemp matting) would be deployed to ensure erosion of the newly placed soils does not occur. If required soil seeding would be undertaken.

## **7.5 Assessment of Likely Effects**

### **Construction Phase**

Without appropriate design and controls, construction of the proposed development has the potential to impair hydrogeology, flood risk and drainage, such as:

- An adverse effect on surface water or groundwater quality from pollution, fuel, oil, concrete or other hazardous substances;
- Potential adverse change of surface and groundwater flow paths and contribution to areas of peat, designated sites and water dependent habitat (including GWDTE); and,
- Increased flood risk to areas downstream of the site through increased surface water runoff.

### **Surface Water and Groundwater Quality**

As stated above, the proposed development would be undertaken in accordance with the relevant technical guidance, PPG/GPPs and other codes of best practice, to limit the potential for contamination of both ground and surface waters. In addition, a site-specific CEMP would be prepared by the Principal Contractor and include a water quality management plan.

The above measures would significantly reduce the likelihood of pollutants, including suspended solids, being discharged to nearby watercourses or groundwater.

The safeguards included in the proposed development design and the committed best practice construction techniques would also safeguard the quality of water which sustains water dependent habitats and PWS sources.

Surface water and groundwater are considered highly sensitive receptors. The proposed development and proposed safeguards embedded in the development design reduce the magnitude of potential change to negligible, during the construction phase. The significance of effect is therefore assessed as **negligible**. No additional mitigation, over and above confirmatory monitoring, is therefore required.

### **Groundwater Levels and Flows**

As discussed in the baseline assessment, the proposed development will be constructed on deposits that contains limited groundwater (upper weathered surface and secondary fractures of the bedrock). No large-scale excavation is proposed to develop the proposed access track and thus there is little potential to intercept groundwater or manage large quantities of groundwater.

Groundwater is considered a highly sensitive receptor. As a consequence of the proposed design, the potential change on groundwater levels and flows is assessed as negligible and thus the resultant significance of effect is **negligible**. No additional mitigation is required.

### **Drainage and Flood Risk**

Best practice measures listed above would be included in the CEMP and would be used to control and manage surface flows and maintain existing water flow paths at a local scale and be used to ensure water flow paths to watercourses and water dependent habitat would be maintained.

It is proposed that the proposed development will use existing watercourse crossings wherever possible. Where new watercourse crossings cannot be avoided, the following measures will be implemented to protect surface water and groundwater quality as well as to mitigate a potential increase in flood risk:

- Silt traps / check dams will be used to capture suspended solids generated during construction; and,
- Construction will be carried out in accordance with appropriate SEPA and CIRIA guidance.

The design and capacity of the watercourse crossings would be agreed by the Principal Contractor in consultation with SEPA as part of the detailed design.

The proposed development would marginally increase impermeable surfacing and could therefore, without appropriate control and mitigation, increase both the rate and volume of surface water shed from the application site. To mitigate this, it is proposed to incorporate SuDS in order to provide attenuation and thereby control the runoff generated onsite.

The detailed drainage design would be agreed with THC by the Principal Contractor prior to construction occurring and would ensure that there is no increase in flood risk downstream of the proposed development.

With these safeguards, the magnitude of potential change is assessed as negligible and the resultant significance of effect is assessed as **negligible**. No additional mitigation is required.

### **Private Water Supplies**

The baseline assessment has confirmed that properties locally maintain private water supplies and that some of the water sources lie close to or downstream of the proposed development. Micro-siting, and good practice techniques that prevent pollution of surface water and maintain the integrity of the distribution pipework, will be required to safeguard these private water supplies.

A detailed assessment of PWS sources is presented in [Appendix 7.2](#) and the PWS sources identified at risk from the proposed development are identified.

With the best practice construction techniques to protect surface water and groundwater receptors outlined above, in combination with the proposed PWS monitoring programme (see example in [Appendix 7.2](#)), the magnitude of potential impact is assessed as negligible and the resultant significance of effect is assessed as negligible. No additional mitigation is required.

### **Operational Phase**

During the operational phase of the proposed development, it is anticipated that routine maintenance of infrastructure would be occasionally required which has the potential to result in the following effects without appropriate controls or mitigation:

- An adverse effect on surface water or groundwater quality from pollution, fuel, oil, concrete or other hazardous substances from site traffic associated with maintenance activities;
- Adverse changes to surface water flow paths, watercourse discharge rates and volumes, and alteration of watercourse geomorphology; and,
- As a result of an alteration of groundwater and surface water flow paths, an adverse effect on water abstractions and water dependent habitat.

Should any maintenance be required onsite which would involve construction activities method statements would be developed and used which will adopt the best practices agreed with regulators as part of the construction phase CEMP.

### **Surface Water and Groundwater Quality**

During the operation phase of the proposed development, the risk of contamination from the proposed development is considered to be very low, as there would be no requirement for the storage of any potentially hazardous substances and runoff from the proposed development would typically comprise of clean rainwater runoff from the road.

It is therefore anticipated that the magnitude of a potential change on surface water or groundwater during the operational phase of the proposed development would be negligible, as no detectable change would likely occur. Therefore, the significance of effect during the operational phase of the proposed development is predicted to be **negligible** on surface water and groundwater. No further or additional mitigation is therefore required.

### **Surface Water and Groundwater Flow**

During the operation of the proposed development, it is not anticipated that there would be any excavation or need to stockpile soils, reducing the potential for effects on surface and groundwater flows. Any excavation, handling and placement of material would be limited to landscaping works and be subject to the same safeguards that would be used during the construction phase of the project.

The likelihood, magnitude and duration of works which have the potential to change surface and groundwater flow paths would be negligible following adherence to good practice measures. Therefore, the potential significance of effect on surface and groundwater is **negligible**. No mitigation is therefore required.

### **Flood Risk**

The Applicant will provide General Environmental Management Plans ('GEMPs') as part of the CEMP, and in accordance with these, proposed infrastructure would be subject to routine inspection and, if required, maintenance. Where identified, any remedial works would be undertaken using the same controls and authorisations detailed above and would be deployed during the construction phase of the project. CEMP which will be a conditional requirement attached to the permission.



The likelihood, magnitude of change and duration of works which have the potential to alter surface and groundwater flow paths would be negligible following adherence to good practice measures. Therefore, the potential significance of effect on surface and groundwater is **negligible**. No mitigation is therefore required.

### **Private Water Supplies**

Given the controls and assessment presented above, no significant impact on surface water or groundwater quality or flow is anticipated during the operational phase of the development. Accordingly, the potential significance of effect on PWS sources is assessed as negligible. No additional mitigation is therefore required.

## **7.6 Further Mitigation and Enhancement**

### **Construction Phase**

As there are no predicated significant effects under the terms of the EIA Regulations, other than the good practice measures that the developer would implement as standard (and as described above), no specific mitigation during construction is required.

### **Operational Phase**

As there are no predicated significant effects under the terms of the EIA Regulations, other than the good practice measures that the applicant would implement as standard, no specific mitigation during operation is required.

## **7.7 Residual Effects**

No significant residual effects on surface water or groundwater receptors including designated water dependent sites, GWDTE, PWS sources and DWPAAs, and flood risk and drainage are predicted during the construction and operation of the proposed development.

## **7.8 Monitoring**

It has been recognised in this assessment that a programme of water monitoring would be required prior to any construction activity and during construction of the proposed development. The monitoring programme would be agreed with Scottish Water, SEPA, NatureScot, THC, Marine Science Scotland, and local fisheries boards and it is expected to include monitoring of the watercourses which drain from the site and private water supplies as discussed in [Appendix 7.2: PWSRA](#).

## **7.9 Cumulative Effects**

The assessment also considers potential cumulative effects associated with other developments within the same surface water catchments as the proposed development.

A cumulative effect is considered to be the effect on a geological, hydrological or hydrogeological receptor arising from the proposed development in combination with other proposed developments which are likely to affect soils or geology, surface water and groundwater.

Proposed developments within the same catchment as the site and within a distance of 5km from the proposed development have been considered, including:

- Allt an Iagain Hydro Scheme (Reference: 17/01204/FUL); and,
- Coire Glas Hydro Scheme (Reference: ECU00000577).



None of these developments are located downstream of the proposed development and therefore are not influenced by any potential effects from the proposed development.

These developments have also been consented recently and therefore adopted current industry standard guidelines and would be managed in accordance with best practice, industry standards and relevant legislation, planning policy and guidance regulated by statutory consultees. These standards ensure, with respect to soils, geology and the water environment, potential impacts are mitigated and controlled at source.

The magnitude of cumulative impact is therefore considered negligible and the potential effect on identified receptors is negligible and not significant.

## 7.10 Summary

Existing geological, hydrogeological, hydrological and soil conditions have been confirmed and used to assess the potential effects the proposed development might have on hydrogeology, flood risk and drainage.

Best practice construction techniques that would safeguard soils, geology and the water environment and would be incorporated in the detailed design and during the construction works have been identified. Subject to the adoption of the best practice techniques described above no significant likely effects on soils, geology or the water environment have been identified during the construction and operational phases of the proposed development.

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