

# Appendix 11.1

## Surface Water Environment Baseline Conditions

Transport Scotland  
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## 1. Introduction

- 1.1.1 This report is a technical appendix to the A9 Dualling Dalraddy to Slochd – DMRB Stage 3 Environmental Statement, Chapter 11: Road Drainage and the Water Environment.
- 1.1.2 This report documents baseline conditions of the surface water environment within the Proposed Scheme study area assessed in Chapter 11.

## 1.2 Aims and Objectives

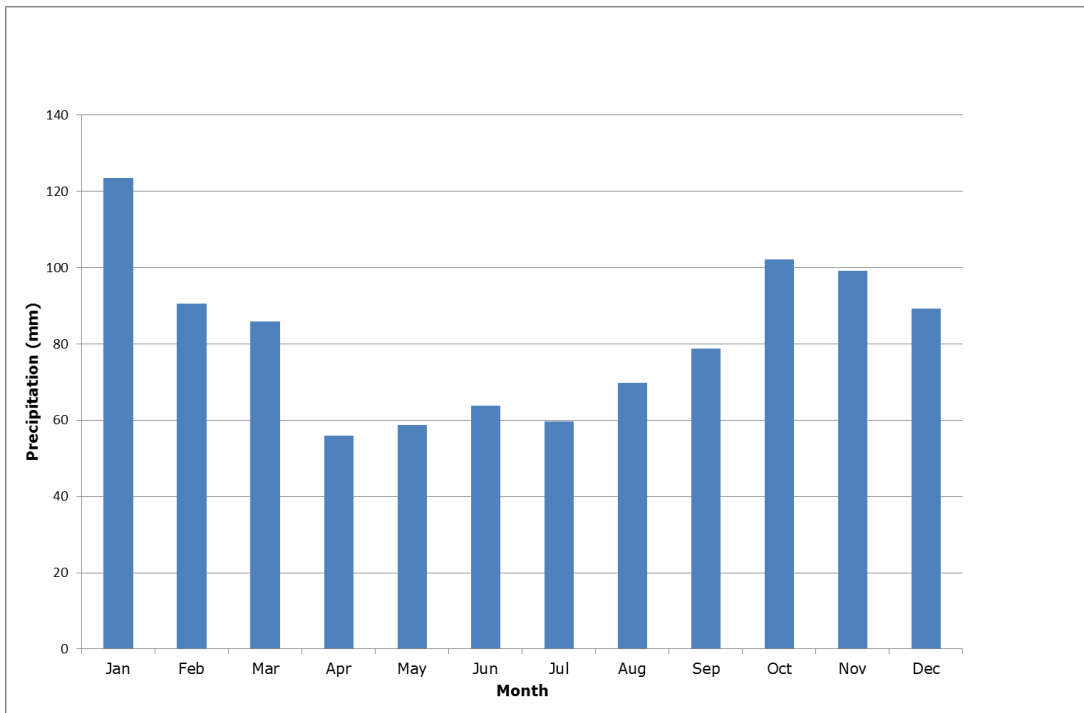
- 1.2.1 This document provides baseline information regarding surface water body receptors within the Proposed Scheme study area. Specifically, information on the following topics are provided within this document:
- Rainfall;
  - Surface water catchment and channel descriptions;
  - Surface water flows;
  - Standing waters;
  - Water quality; and
  - Water supplies, abstractions and discharges, including:
    - Public water supplies;
    - Private water supplies;
    - SEPA CAR registered abstractions and discharges; and
    - Existing road drainage discharges.
- 1.2.2 Baseline information on the hydromorphology and flood risk of the watercourses within the study area is documented in Technical Appendices 11.2 and 11.3, respectively.

## 2. Baseline Conditions

### 2.1 Rainfall

- 2.1.1 The Meteorological (Met.) Office regional climate information locates the Proposed Scheme within the Northern Scotland regional climatic area<sup>i</sup>. Rainfall across this region varies from over 4000mm per annum near Fort William to less than 700mm per annum along the Moray Firth coast.
- 2.1.2 Data from the Met. Office monitoring station at Aviemore for the 1981–2010 period is presented as Chart 2.1, providing monthly rainfall data. The Aviemore station is located at NGR NH 897 143, at an altitude of 228m AOD, and has a standard annual average rainfall (SAAR) of 977mm.
- 2.1.3 The SAAR at Dalraddy and Slochd Summit has been derived from the Flood Estimation Handbook (FEH). Dalraddy, located approximately 6km to the southwest of the Aviemore weather station, is located at an altitude of 220m AOD and has a SAAR of approximately 850mm. Slochd Summit, located approximately 12km to the northwest of the Aviemore station, is located at an altitude of 405 mAOD and has a SAAR of 1001mm.

**Chart 2.1: Average Monthly Rainfall Data (mm) for Aviemore Met Office Monitoring Station, 1981-2010**



- 2.1.4 The greater rainfall value derived for the Slochd Summit is a reflection of the higher elevation, with prevailing winds from the southwest delivering more precipitation across this higher ground. Monthly rainfall trends across the Study Area would be expected to be similar to that recorded at Aviemore.
- 2.1.5 The UK Climate Projections Report<sup>ii</sup> provides an indication of regional climate trends across the UK taking account of climate change. Within this document probabilistic projections of climate change suggest that Northern Scotland will experience slightly increased temperatures in both summer and winter. This may result in a reduction in summer precipitation and an increase during winter.
- 2.1.6 If climate change leads to drier summers, low flows and water shortages may occur in prolonged periods of dry weather. Increase in winter precipitation could increase the risk of and extent of flooding. Climate change rainfall factors are accordingly included within peak flows and the flood risk assessment.

## 2.2 Designated Sites

- 2.2.1 In line with DMRB Guidance document 44/09 'Assessment of Implications of European Sites', internationally and nationally designated sites have been identified within 5km of the Proposed Scheme and are summarised in Table 2.1. Several have been screened out due to being not relevant to the water environment assessment, not hydrologically connected to the site, or being sufficiently far upstream as to be unaffected by the Proposed Scheme. Those identified as being hydrologically relevant and connected with the Proposed Scheme have been summarised with reference to SNH Key Site Documents via the SNH Gateway website<sup>iii</sup>.



**Table 2.1: Relevant International and National Designations within 5km of the Proposed Scheme**



Site Name	Site Description
Alvie SSSI	<p>Alvie SSSI is located adjacent to the southern end of the Proposed Scheme and its boundary is aligned immediately adjacent to the existing A9 southbound carriageway in several locations. It is 3km southwest of Aviemore at NGR NH 858 094, occupying an area of 339ha and comprises a large area of native woodland, loch and wetland habitats. The Proposed Scheme encroaches upon the designated area in several locations between the southern end of the Proposed Scheme and Lynwilg Farm.</p> <p>There are three lochs within the designated area, with Loch Alvie being the largest. All three lochs are surrounded by inter-connected wetland habitats including a range of diverse fen and mire communities. The notified features of this SSSI includes the hydromorphological mire range and its importance as a breeding area for goldeneye.</p>
River Spey SAC & SSSI	<p>The River Spey is designated as both a SAC and a SSSI with the designated boundaries extending along the majority of the full length of the river. The River Spey flows roughly parallel to and downstream of the Proposed Scheme for approximately 20km. The majority of watercourses crossed by the Proposed Scheme flow directly into this SAC and SSSI.</p> <p>The SAC designated area also extends up several tributaries of the River Spey within the study area and is crossed by the existing A9 at the Allt-na-Criche (Lynwilg) tributary at NGR NH 897 226, the River Dulnain at Carrbridge (NGR NH 896 885) and the Allt Ceatharnach at NGR NH 891 231.</p> <p>The River Spey is considered to have very good water quality and supports a variety of freshwater and riparian habitats including beds of shingle, gravel, sand and silt, islands, fringing woodlands and marshes. The SAC qualifying interests for which the site is designated includes its support of populations of otter, freshwater pearl mussel, sea lamprey, and Atlantic salmon; which are, likewise, the notified features of the SSSI designation.</p>
Craigellachie SSSI & NNR	<p>Craigellachie is designated as both a SSSI and a NNR and is located immediately adjacent to the existing A9 northbound carriageway at Aviemore for approximately 3km. The designated area is centred on NGR NH 882 121 and occupies 377.7ha.</p> <p>The site is notified for upland birch woodland and for its invertebrate interest, specifically moths. The site also comprises two small lochs, including Loch Puladdern, which is noted as part of the site's intricate mixture of habitats.</p> <p>The Proposed Scheme encroaches upon much of the designated area's eastern boundary, where Loch Puladdern is located.</p>
Loch Vaa SPA & SSSI	<p>Loch Vaa is designated as both a SPA and a SSSI and shares the same designation boundary. This boundary is aligned immediately adjacent to the southbound side of the A95 road which is within 100m of the Proposed Scheme, and separated by the Highland Main Line (HML) railway. The loch is located approximately 4km northeast of Aviemore at NGR NH 914 176, and occupies an area of 44.6ha.</p> <p>The designated areas surround a small, nutrient poor (oligotrophic) spring-fed loch. The Loch Vaa SPA qualifies by supporting breeding populations of slavonian grebe and goldeneye; which are, likewise, the notified features of the SSSI. The Loch Vaa designated site also features a series of small species-rich bays along the indented shoreline.</p>

## 2.3 Surface Water Catchment and Channel Descriptions



- 2.3.1 The Proposed Scheme is located almost entirely within the River Spey hydrological catchment with its northernmost extent just encroaching upon the River Findhorn catchment. The Proposed Scheme crosses several larger tributaries of the River Spey including the River Dulnain and its tributary Allt Ruighe Magaig, the Allt an Fhearna and Allt-na-Criche; in addition to numerous minor burns and ditches which flow directly into the Spey.
- 2.3.2 The interaction and proximity between the Proposed Scheme and these watercourses is illustrated in Figure 11.1 Surface Water.
- 2.3.3 Individual watercourses are discussed below, including summary hydromorphology baseline descriptions; further hydromorphology details are available in Appendix.11.2 Hydromorphology Assessment.



**Table 2.2: Description of watercourses within the Proposed Scheme Study Area**



River Description	Photograph
<p><b>River Spey</b></p> <p>The River Spey is the longest river in Scotland, rising 2km northwest of Loch Spey in the Monadhliath Mountains at 500m AOD (above Ordnance Datum) and flowing northeast to discharge into the Moray Firth at Spey Bay. The river drains a total area of 2948km<sup>2</sup>. The river is characteristic of an alpine watercourse with high flow levels often attributed to snow melt. The upper reaches drain upland landscapes such as open moorland and conifer plantation forestry, with arable agricultural land in lower valley floors. The upper and lower reaches of the watercourse are of a steep gradient and fast flowing with the middle reaches having a gentle gradient with a slower flow.</p> <p>The Proposed Scheme does not cross the River Spey, but is orientated roughly parallel with the river in the vicinity of Aviemore, with the nearest point located 200m southeast of the existing A9 carriageway at NGR NH 885 104. In this area, the river exhibits a gentle channel gradient with a moderate flow and a meandering course. Bed and bank sediments mainly comprise cobbles and gravel with deposition visible on inside channel meanders.</p>	
<p><b>Allt an Fhearna</b></p> <p>The Allt an Fhearna has a catchment area of approximately 22.4km<sup>2</sup>, with the headwaters rising on the steep mountainous slopes between An Suidhe, Carn Coire Dhugain and Garbh-mheall rising to an altitude of 590m AOD. The river flows east, across a steep gradient course and is crossed by the existing A9 carriageway at NGR NH 854 092, approximately 700m upstream of its confluence with Loch Alvie at NGR NH 859 095. Loch Alvie drains to the east via the Allt Dibheach, which discharges to the River Spey at NGR NH 884 100.</p> <p>The channel has been historically modified (straightened), but does possess a diverse range of sedimentary features and processes, including mid-channel and marginal gravel bars, riffles and large woody debris. The channel suggests some lateral adjustment and incision occurring upstream of the existing A9 crossing and is considered a sediment exchange system. Downstream the channel is considered a stable transfer system.</p>	

River Description	Photograph
<p><b>Allt Chrioichaidh</b></p> <p>The Allt Chrioichaidh is a small mountainous watercourse rising between the peaks of An Sguabach, Geal-charn Mor and Creag Ghleannain, which reach an altitude of 700m AOD. The catchment is approximately 2.9km<sup>2</sup> draining steep moorland slopes via an incised channel before discharging into Loch Alvie at NGR NH 859 096. Upstream of this confluence the watercourse is crossed by the existing A9 carriageway at NGR NH 857 095.</p> <p>The channel upstream of the crossing has formed a step-pool sequence indicating a reasonable amount of stream power potential but with no evidence of erosion or deposition suggesting a stable transfer system. The channel is significantly modified around the existing crossing (see photo). Downstream of the crossing, there is some evidence of lateral adjustment with some bank erosion, and some incision around the culvert outlet; here the channel is considered to be a stable sediment exchange system.</p>	
<p><b>Ballinluig Drain</b></p> <p>This is a very small field drain on the northbound side of the A9 carriageway, joins a roadside drainage ditch, and is likely to be ephemeral flow. The channel is indistinct through grass.</p>	<p>No photo.</p>
<p><b>Caochan Ruadh</b></p> <p>The Caochan Ruadh is a small upland watercourse and has a catchment area of approximately 1.83km<sup>2</sup>. It initially drains open moorland, flowing predominantly southeast via a steep, narrow channel prior to flowing through modified field drains and a small network of ponds, before being joined by a smaller tributary stream approximately 35m upstream of the existing A9 crossing at NGR NH 866 101. The burn subsequently discharges to Loch Alvie at NGR NH 866 099.</p> <p>At the existing crossing location the channel is narrow, approximately 1m wide with a shallow channel gradient. Approximately 40m upstream of the existing A9 crossing, a track with a small bridge crosses the watercourse at NGR NH 866 101 (see photo for upstream view). Flows were highly energetic upstream of the crossing location at the time of survey, with a number of chutes and cascades of step features, with some areas of rippled flow. Erosion and bank slips were common along the steeper parts upstream of the channel and there were occasional gravel bars suggesting that some lateral adjustment was occurring, but overall the channel was relatively stable. Downstream of the crossing, there were no visible signs of erosion, although there was some large woody material present. At this location the channel is considered to be a stable sediment transfer system.</p>	







River Description	Photograph
<p><b>Ballinluig Burn</b>            An unnamed tributary of Loch Alvie rises on the south eastern slopes of Creag Ghleannain at 320m AOD and has a catchment area of 1.05km<sup>2</sup>. The watercourse flows predominantly southwards and is crossed by the existing A9 carriageway at NGR NH 869 102, near Ballinluig, continuing south to discharge to Loch Alvie at NGR NH 870 099. While unnamed on the OS maps this stream is referred to as the Ballinluig Burn throughout this chapter for ease of reference.</p> <p>The channel has been historically straightened and crossed several times by numerous access roads and the A9. Rippled flows were observed upstream of the crossing, with some cascades over infrequent steps, but there was little sign of any fluvial activity, with few areas of erosion and no deposition features. There were few signs of instability and flows were slightly less energetic downstream of the crossing. Overall, the channel is considered to be a stable sediment transfer system.</p>	
<p><b>Lynwilg Drain 1</b>            This is an existing A9 drainage culvert. Flows are likely to be ephemeral.</p>	<p>No photo.</p>
<p><b>Lynwilg Drain 2</b>            This is an existing PED drainage culvert position 280m west of the junction with the B1952, bordered by agricultural fields. There was no evidence of a natural watercourse and no flows observed at the time of visit. Flows are ephemeral.</p>	



River Description	Photograph
<p><b>Allt-na-Criche (Lynwilg)</b></p> <p>The Allt-na-Criche has a catchment area of 6.28km<sup>2</sup> and drains headwaters that rise at approximately 630m AOD between the steep slopes of Cairn Creag Ghleannain and Carn Dearg Mor. From its source, the watercourse flows southeast and is crossed by the existing A9 carriageway at NGR NH 884 106. At this crossing the watercourse is heavily modified with a straightened channel and bank modifications. The B9152 and HML cross the watercourse 50m and 90m downstream of the existing A9 crossing location, respectively, before its confluence with the River Spey at NGR NH 885 104.</p> <p>Upstream of the crossing, there are a number of step-pools and large gravel bars. The channel overall is primarily a sediment transfer system, and largely stable except for some isolated areas of bank failure. Downstream of the crossing, there are few signs of fluvial erosion; however, there are a number of side bars underneath the crossings. The channel appears to be narrowing through the preferential deposition of coarse material, however this may be localised underneath these crossings.</p>	 A photograph showing a river channel flowing through a stone-lined culvert. The water is turbulent and white with foam. The culvert is supported by concrete pillars. In the background, a bridge with a metal railing spans over the culvert. The surrounding area is grassy with some trees.
<p><b>Kinakyle Drain</b></p> <p>This is an existing A9 drainage culvert and flows are ephemeral. This drain is under the A9 where the road runs parallel to the railway line. To the west the adjacent hill slope rises steeply to Craigellachie while there is relatively flat farmland on the oxbow meander of the flood plain to the east.</p>	 A photograph of a circular culvert opening in a brick wall. The opening is dark and surrounded by green grass and some fallen leaves. The brickwork is visible on either side of the opening.



River Description	Photograph
<p><b>Birch View Drain</b> This is a small hillside watercourse draining wooded area on the northbound side of the A9 carriageway that joins a roadside drainage ditch. This drain runs from the western embankment of the A9 where the road runs parallel to the railway track in the east. Again, the slope above rises relatively steeply to Craigellachie, but here the road is surrounded by forestry.</p>	
<p><b>Aviemore Drain 1</b> This is an existing A9 drainage chamber / culvert conveying flows from a drainage ditch on the northbound side of the road. Flows are ephemeral.</p>	

River Description	Photograph
<p><b>Aviemore Drain 2</b> This is an existing A9 drainage chamber / culvert conveying flows from a drainage ditch on the northbound side of the road. Flows are ephemeral.</p>	
<p><b>Aviemore Drain 3</b> This is an existing A9 drainage chamber / culvert conveying flows from a drainage ditch on the northbound side of the road. Flows are ephemeral.</p>	



River Description	Photograph
<p><b>Milton Drain 1</b></p> <p>This is an existing A9 drainage chamber / culvert conveying flows from a drainage ditch on the northbound side of the road. Flows are ephemeral. The drain is located on the edge of woodland where it adjoins the outskirts of Aviemore town.</p>	
<p><b>Aviemore Burn (Steallan Dubh/Milton Burn)</b></p> <p>The Aviemore Burn has a catchment area of 7.45km<sup>2</sup> and predominantly drains forestry via several smaller tributaries, including the Steallan Dubh and Milton Burn, on the northbound side of the existing A9 carriageway. These tributaries converge upstream of the existing A9 before flowing east to the existing A9 crossing location at NGR NH 893 139. The watercourse then flows south via a straightened and realigned channel that has been diverted to accommodate properties on the western fringe of Aviemore, before flowing southeast through the town to discharge to the River Spey at NGR NH 898 125.</p> <p>A range of energetic flows have been observed, including chute flow over and around boulders, cascades, rippled flow, and some ponding. There are few obvious signs of erosion, and only localised deposits. Overall, the channel is considered primarily to be a stable sediment transfer system.</p>	


River Description	Photograph
<p><b>Milton Drain 2</b></p> <p>This is an existing A9 drainage culvert. Flows are ephemeral. This drain flows through an area of relatively open land where the surrounding area of Aviemore outskirts has been developed on both sides.</p>	
<p><b>The Shieling / Easter Aviemore Burn</b></p> <p>This is an unnamed tributary of the River Spey with a catchment area of 1.4km<sup>2</sup> that drains forest and grassland on the northbound side of the existing A9 carriageway. It flows predominantly southeast towards the crossing location at NGR NH 894 142. From this location the watercourse flows generally east, skirting the Shieling, Easter Aviemore and the northern fringe of Aviemore, before discharging to the River Spey at NGR NH 907 140. While unnamed on the OS maps this stream is referred to as the Shieling / Easter Aviemore throughout this chapter for ease of reference.</p> <p>Step-pools were noted, helping to create chute flow, cascades and rippled flows and overall there was little erosion or deposition to indicate instability. The channel is considered to be functioning as a stable sediment transfer system.</p>	



River Description	Photograph
<p><b>Granish Drain 1</b>            This is an existing A9 drainage chamber / culvert. Flows are ephemeral. This is situated in a scrubby area of the A9 verges on the outskirts of Aviemore.</p>	
<p><b>Granish Drain 2</b>            This is an existing A9 drainage chamber / culvert. Flows are ephemeral. This is immediately to the south of Allt na Criche (Granish) bifurcation south as described below.</p>	<p>No photo</p>
<p><b>Allt na Criche (Granish) bifurcation south</b>            This is a small watercourse draining slopes to the west of the A9. The channel is a bifurcation of the Allt na Criche (Granish) watercourse which has been historically modified. There is a plastic pipe in place at the point of bifurcation which is assumed to have been installed to maintain flow via this channel and there is further modification at the A9 crossing location. The watercourse is, however, well established and possesses morphological features such as step-pool sequences. This is flowing through a relatively undulating wooded area on the outskirts of Aviemore.</p>	



River Description	Photograph
<p><b>Granish Drain 3</b>            AThis is an existing A9 drainage chamber / culvert. Flows are ephemeral. As above, this drain is located in open undulating ground east of the A9 section running parallel with General Wade’s Military Road known as the B9152.</p>	
<p><b>Allt na Criche (Granish)</b>            Allt na Criche rises on the southern slopes of Carn Avie and has a catchment area of approximately 2.94km<sup>2</sup>. The watercourse flows southeast towards Sluggangranish, before turning northeast to flow parallel with the northbound carriageway of the existing A9 for approximately 1.2km. Within this reach two separate bifurcating channels branch off from the main stem and flow towards the existing A9, in the vicinity of Sluggangranish and Granish respectively. The main stem of the watercourse continues to flow northeast, draining forestry on the south eastern slopes of Carn Avie before encountering the existing A9 crossing at NGR NH 901 157 (photo 1). From this location, the watercourse flows east to drain to Loch nan Carraigean at NGR NH 907 156.</p> <p>Flows in the main channel, in the vicinity of the existing crossing, range from rippled to chute flow, and unbroken standing waves have been noted in some locations, as well as some ponded flows behind the boulders. Some areas of erosion have been noted and some fine sediment deposition along the bed. Overall the channel is considered to be functioning primarily as a stable transfer system.</p> <p>The bifurcated channel near Sluggangranish flows southeast away from the main channel, initially in culvert but emerging immediately to the west of the existing A9. It passes under the A9 at NGR NH 897 147, at the same location as an access underpass, before flowing southeast to join the previously discussed unnamed Spey tributary on the northern edge of Aviemore.</p> <p>The bifurcated channel near Granish flows southeast away from the main stem in a bunded channel, and passes under the existing A9 carriageway at NGR NH 898 150 in a long culvert. It should be noted that during a visit in April 2016 the channel bunds had been damaged by cattle trampling such that no flow was reaching the A9 culvert, nevertheless flow was ponding in low lying ground in the adjacent field. Although no flow was observed entering the culvert a significant amount of running</p>	







River Description	Photograph
<p>water could be heard within the culvert, suggesting a possible inflow from the existing A9 drainage. The channel reappears at NGR NH 899 150 flowing via a manmade concrete channel (photo 2) for approximately 6m before being crossed by a track. It then continues to flow southeast and is crossed by the B9152 road at NGR NH 900 149. No channel is shown on OS mapping downstream of this location; however, it is likely that this branch discharges to a small cluster of standing waterbodies, the largest being Lochan Ban, centred on NGR NH 902 150 at Granish.</p>	
<p><b>Avielochan Drain 1</b> This is an existing A9 drainage chamber / culvert. Flows are ephemeral but likely to be affected by existing A9 drainage. Here the A9 runs through a relatively low lying woodland valley above the west bank of the River Spey. This is an existing A9 drainage chamber / culvert. Flows are ephemeral.</p>	



River Description	Photograph
<p><b>Avie Lochan Burn South</b></p> <p>This is an unnamed tributary of Avie Lochan with a catchment area of 1.5km<sup>2</sup>, drains forestry on the northbound side of the existing A9 carriageway, and flows east to the crossing location at NGR NH 902 164. On the northbound side of the crossing the channel is wide with concrete bed and banks and a large stepped channel bed on the approach to the existing culvert. Downstream of the crossing the channel continues to flow east to discharge to Avie Lochan at NGR NH 904 164.</p> <p>The channel possesses a diverse range of flow types, primarily comprising energetic flows such as chute and cascade, but where sheltered, pond areas form. Despite the high energy, very little erosion has been observed; however, the river system displays some deposition features mostly corresponding with natural fluvial activity (point bars) and not widespread. Overall, the channel is considered to be functioning as a stable transfer system, with some function as a minor sink for fine sediment.</p>	
<p><b>Avielochan Drain 2</b></p> <p>This is an existing A9 drainage chamber / culvert. Flows are ephemeral.</p>	<p>No photo.</p>



River Description	Photograph
<p><b>Avie Lochan Burn North</b>            Another small unnamed tributary of Avie Lochan is located approximately 350m north of the previous tributary described, and drains forestry on the northbound side of the existing A9 carriageway. The river flows east to a crossing location at NGR NH 903 167. Upstream the gradient is very steep and the channel has been stepped down the slope; there was little flow observed during the walkover survey. Downstream, on the southbound side, there is a small manmade structure which is suspected to be related to water abstraction.            The watercourse is too small for a catchment size to be derived using FEH software.</p>	
<p><b>Avielochan Drain 3</b>            This is an existing A9 drainage chamber / culvert. Flows are ephemeral. Across the A9 road to the west this drain inlet is located in relatively open land just below a forested area.</p>	
<p><b>Avielochan Drain 4</b>            This is an existing A9 drainage chamber / culvert. Flows are ephemeral.</p>	<p>No photo</p>

River Description	Photograph
<p>Laggantygown Drain 1            This is an existing A9 drainage ditch / culvert. Flows are ephemeral. The picture view is downstream from the structure itself approximately 25m away from Laggantygown Pond.</p>	
<p>Laggantygown Drain 2            This is an existing A9 drainage ditch / culvert. Flows are ephemeral. This drain is in a very similar location to Laggantygown Drain 1 adjacent to woodland to the west and an open farmland area to the east.</p>	
<p>Laggantygown Drain 3            This is an existing A9 drainage ditch / culvert. Flows are ephemeral.</p>	<p>No photo</p>



River Description	Photograph
<p><b>Loch Vaa Drain 1</b> This is an existing A9 ditch / drainage culvert. Flows are ephemeral. The drain is located in a gently sloping area of woodland approximately 270m to the west of Loch Vaa.</p>	 A photograph showing a narrow, shallow ditch or culvert cut into the ground in a wooded area. The ditch is filled with water, and the surrounding ground is covered with fallen leaves and some green grass. The water appears to be flowing through the ditch.
<p><b>Loch Vaa Drain 2</b> This is an existing A9 drainage culvert. Flows are ephemeral. This drain flows out in an area of relatively gentle slope in wooded ground between the A9 and the railway track.</p>	 A photograph of a stone culvert structure. The culvert is built from large, grey, rectangular stones and is partially covered with moss and lichen. It is situated in a wooded area with grass and other vegetation around it.



River Description	Photograph
<p><b>Allt Cnapach Drain 1</b> This is an existing A9 drainage ditch / culvert. Flows are ephemeral. This drain lies approximately 200m west of Kinveachy settlement again in an area of relatively open woodland.</p>	
<p><b>Allt Cnapach</b> Allt Cnapach is a small watercourse with a catchment area of 1.2km<sup>2</sup> that drains forestry on the northbound side of the existing A9 carriageway at Kinveachy. The watercourse flows east to be crossed by the A9 at NGR NH 910 185 and the adjacent HML. OS mapping and aerial images suggest that the watercourse drains to groundwater at NGR NH 913 184, approximately 350m downstream, east-southeast of the existing crossing.</p> <p>Upstream of the crossing, the channel exhibits energetic and diverse flow types along its course, dominated by a series of cascades over steps. There is minimal evidence of erosion and deposition; overall the channel is a stable transfer. Downstream, the flows are mainly rippled, however the channel becomes increasingly ponded downstream as the channel it has been increasingly more modified and affected by downstream impoundments. The reach at the existing A9 crossing is considered to be a sediment transfer and downstream sink; overall the channel is considered stable.</p>	



River Description	Photograph
<p><b>Kinveachy Drain 1</b> This is an existing A9 drainage ditch / culvert. Flows are ephemeral. The watercourse drains the wooded slopes to the west of the A9 road in an area overlooking more open land in the adjacent valley below to the east.</p>	 A photograph showing a black corrugated metal culvert opening in a grassy area. The culvert is partially obscured by dry leaves and twigs. The surrounding vegetation is green and brown, suggesting an autumn or winter setting.
<p><b>Kinveachy Drain 2</b> This is an existing A9 drainage basin / outfall. Flows are ephemeral. The watercourse drains the wooded slopes to the west of the A9 road in an area overlooking more open land in the adjacent valley below to the east.</p>	 A photograph showing a black corrugated metal culvert opening in a rocky, leaf-covered area. The culvert is surrounded by grey stones and brown autumn leaves. A fern frond is visible in the upper left corner of the image.


River Description	Photograph
<p><b>Kinveachy Drain 3</b> This is an existing A9 drainage ditch / culvert. Flows are ephemeral. The watercourse drains the wooded slopes to the west of the A9 road in an area overlooking more open land in the adjacent valley below to the east.</p>	 A photograph showing a wooded slope. The ground is covered with a dense layer of brown, dried ferns and green moss. Several thin, light-colored tree trunks are visible, and the background shows more trees in a forest setting.
<p><b>Docharn Drain</b> This is an existing A9 drainage ditch / culvert. Flows are ephemeral. The view downstream shows that forested land occupies the surrounding area.</p>	 A photograph of a forested area. The ground is covered with green moss and some yellow leaves. Several thin, light-colored tree trunks are visible, and the background shows more trees in a forest setting.







River Description	Photograph
<p><b>Feith Mhor Drain 1</b> Feith Mhor Drains 1 to 7 and Feith Mhor Tribs 1 &amp; 2 are located between Docharn Wood to the east and below Carn Lethen summit in the west. It is an existing A9 drainage ditch. Flows are ephemeral.</p>	
<p><b>Feith Mhor Drain 2</b> This is an existing A9 drainage ditch. Flows are ephemeral.</p>	



River Description	Photograph
<p><b>Feith Mhor</b></p> <p>Feith Mhor is a tributary of the River Dulnain, rising in the low lying hills to the south east of Carrbridge and the current A9, and with an approximate catchment area of 12.1km<sup>2</sup>. The watercourse drains forestry and grassland and predominantly flows northeast to be crossed by the existing A9 at NGR NH 908 207 and then the HML, approximately 130m downstream. The channel continues to flow northeast to its confluence with the River Dulnain downstream of Carrbridge, at NGR NH 943 241.</p> <p>Upstream of the current A9 crossing, a series of knickpoints can be observed with energetic cascades and evidence of incision. Lengths of rippled and smooth running flows, however, are more common, with riffles also present. Downstream the flows become more uniform as the gradient reduces. Large trees have been noted to be regulating flows, creating both pooled and rippled flows. The channel on the whole is a stable sediment transfer system.</p>	
<p><b>Feith Mhor Trib 1</b></p> <p>This is an ephemeral field drain.</p>	



River Description	Photograph
<p><b>Feith Mhor Drain 3</b> This is an existing A9 drainage ditch / culvert. Flows are ephemeral.</p>	
<p><b>Feith Mhor Trib 2</b> This is an existing A9 drainage ditch / culvert. Flows are ephemeral. It is a very small watercourse with a range of bed material and potential for some morphological features to be present further upstream and downstream from the existing A9 crossing.</p>	

River Description	Photograph
<p>Feith Mhor Drain 4 This is an existing A9 drainage ditch / culvert. Flows are ephemeral.</p>	
<p>Feith Mhor Drain 5 This is an existing A9 drainage ditch / culvert. Flows are ephemeral.</p>	



River Description	Photograph
<p><b>Feith Mhor Drain 6</b> Feith Mhor drains 6 &amp; 7 are in close proximity and drain an area of boggy woodland area of relatively shallow slope traversed by the A9. This is an existing A9 drainage ditch / culvert. Flows are likely to be ephemeral.</p>	
<p><b>Feith Mhor Drain 7</b> This is a small field / forest drain originating from a flat area of marshy grassland on the west side of the A9. Flows are likely to be ephemeral.</p>	



River Description	Photograph
<p><b>Carrbridge Drain 1</b> Carrbridge Drains 1 &amp; 2 drain relatively flat land below the forestry area near the banks of the river Dulnain. This view shows the pipe and chamber of Carrbridge Drain 1. This is an existing A9 drainage ditch / culvert. Flows are likely to be ephemeral.</p>	
<p><b>Carrbridge Drain 2</b> This structure is located in the area as described above for Carrbridge Drain 1. It is an existing A9 drainage ditch / culvert. Flows are likely to be ephemeral.</p>	



River Description	Photograph
<p><b>River Dulnain</b></p> <p>The River Dulnain is a major tributary of the River Spey with an upstream catchment area of 272.2km<sup>2</sup> from the NRFA gauging station 8009<sup>iv</sup> (NGR NH 977 247). The headwaters rise in the Monadhliath Mountains at an altitude of approximately 800m AOD, flowing northeast towards the confluence with the River Spey at NGR NJ 004 238. The River Dulnain is crossed by the existing A9 carriageway at NGR NH 897 226 and then the HML, approximately 90m downstream.</p> <p>Upstream of the A9 crossing the channel exhibits many large mobile gravel bars and few signs of significant active erosion. Flows are energetic and dynamic, with standing waves and rippled flow prevalent. Downstream of the A9 crossing, bank erosion has been noted on the Right Hand Bank (RHB) immediately downstream of the railway. The channel is considered overall to be a stable transfer system.</p>	 An aerial photograph showing the River Dulnain flowing through a wooded area. The river is dark blue and appears to be crossing a bridge or structure. The surrounding landscape is hilly and covered in trees.
<p><b>Ceatharnach Trib</b></p> <p>An existing A9 drainage ditch / culvert. Flows are likely to be ephemeral.</p>	 A close-up photograph of a drainage ditch or culvert. The ditch is filled with water and surrounded by tall, dry grass and other vegetation. The water appears to be flowing through a narrow channel.



River Description	Photograph
<p>Allt nan Ceatharnach (Allt Ruighe Magaig/Baddengorm Burn)</p> <p>The Allt nan Ceatharnach has a catchment area of 17.2km<sup>2</sup> and rises on the hills of Carn Loisgte, Creag a' Bhainne and Can a' Chuaille. It is formed from three major tributaries, the Allt Ruighe Magaig, the Allt a' Bhainne and the Bogbain Burn. Draining open grassland and forestry, the burn flows broadly south and is crossed by the HML at NGR NH 892 233. A further 160m downstream the river is crossed by the existing A9 at NGR NH 891 232, before flowing south to the confluence with the River Dulnain approximately 1.2km downstream.</p> <p>In the vicinity of the existing A9 crossing there are a good range of high energy flows, including cascades, broken and unbroken standing waves over the boulder formations and fallen trees; however, there were higher flows than considered normal at the time of the survey. Some bank erosion was noted on the Left Hand Bank (LHB), but mostly appeared quite stable. Terraces on the RHB suggested the channel had previously shifted its course, but there was little evidence to suggest this process was ongoing. Overall, the channel is considered to be a stable transfer system.</p>	
<p>Ceatharnach Drain</p> <p>This is an existing A9 drainage ditch / culvert. Flows are likely to be ephemeral.</p>	






River Description	Photograph
<p><b>Bogbain Trib</b> This tributary is a small forest drain flowing from south west to north east and is crossed by the A9 and the HML railway. Flows are likely to be ephemeral.</p>	 A photograph showing a small stream flowing through a forest. The water is clear and flows over rocks. The surrounding vegetation includes mosses and small trees.
<p><b>Bogbain Drain</b> This is an existing A9 drainage ditch. Flows are likely to be ephemeral.</p>	 A photograph showing a drainage ditch in a forest. The ditch is a narrow channel of water flowing through a dense thicket of trees and undergrowth. A person in a high-visibility vest is visible in the background.



River Description	Photograph
<p><b>Bogbain Burn</b></p> <p>Bogbain Burn is situated at Black Mount and is formed from several headwaters which rise on the southeastern slopes of Carn a' Chuaille and Carn nam Bain-tighearna, and subsequently converge to the north of the HML. The burn then flows broadly southeast through forestry plantation, roughly parallel with the existing A9, and is crossed several times by the railway and the A938 before joining the Allt nan Ceatharnach at NGR NH 888 239. In this area (NGR NH 871 243) the burn is confined within a narrow, steep sided valley and is approximately 2m wide with a cobble and gravel bed.</p>	
<p><b>Black Mount Drain 1</b></p> <p>This is a small forest drain crossed by the A9 and drains a relatively shallow slope in undulating open boggy ground. Flows are likely to be ephemeral.</p>	



River Description	Photograph
<p><b>Black Mount Drain 2</b> This is an existing A9 drainage ditch / culvert. Flows are ephemeral.</p>	
<p><b>Slochd Drain 1</b> Slochd Drains 1, 2, 3, 4, 5, 6 &amp; 7 are all located along a 340m stretch of the A9 road that rises to higher ground northwards. This is a small forest drain crossed by the A9 and side road. Flows are likely to be ephemeral.</p>	

River Description	Photograph
<p><b>Slochd Drain 2</b> This is a small forest drain crossed by the A9 and side road. Flows are likely to be ephemeral.</p>	 A photograph showing a small, narrow stream flowing through a snowy forest. The water is dark and appears to be flowing over rocks. The surrounding area is covered in snow and sparse, brown vegetation.
<p><b>Slochd Drain 3</b> This is a small forest drain crossed by the A9 and side road. Flows are likely to be ephemeral.</p>	 A photograph showing a small, narrow stream flowing through a snowy forest. The water is dark and appears to be flowing over rocks. The surrounding area is covered in snow and sparse, brown vegetation.

River Description	Photograph
<p><b>Slochd Drain 4</b> This is small forest drain crossed by the A9 and side road. Flows are likely to be ephemeral.</p>	
<p><b>Slochd Drain 5</b> This is an existing A9 drainage ditch / culvert. Flows are ephemeral.</p>	

River Description	Photograph
<p><b>Slochd Mhuic (Allt an Aonaich)</b></p> <p>The Slochd Mhuic has a catchment area of 7.3km<sup>2</sup> draining upland moor and forestry. A heavily modified section of the headwater drains Slochd Summit, flows southeast, and is crossed several times over a distance of approximately 1.3km by the existing A9 carriageway (NGR NH 841 250, NGR NH 838 254, NGR NH 835 256 and NGR NH 835 256). The watercourse continues south, running broadly parallel to the existing A9, to the confluence with Allt Ruighe an t-Sabhail, at NGR NH 843 243. From here the Sloch Mhuic flows predominantly south for approximately 4km, converging with several large streams to become the Allt an Aonaich, which converges with the River Dulnain at NGR NH 864 217.</p> <p>The headwaters of the burn are very heavily modified where it criss-crosses the existing A9, HML and cycle path, with 7 culverts of varying lengths, several straightened reaches, a concrete channel over 400m long and several piped inflows from existing road and rail discharges and one cascade chamber.</p> <p>Downstream of the heavily modified reach the observed flows were mainly rippled, with some cascades over boulders and some very small steps. Overall there was no erosion and little deposition, except for some fine sediment on the bed. The channel did not possess the capacity to undertake any fluvial activity and was mostly a stable sediment transfer system.</p>	
<p><b>Slochd Drain 6</b>          This is an existing A9 drainage ditch / culvert. Flows are ephemeral.</p>	<p>No photo</p>
<p><b>Slochd Drain 7</b>          This is an existing A9 drainage ditch / culvert. Flows are ephemeral.</p>	<p>No photo</p>

River Description	Photograph
<p><b>Slochd Mhuic Trib</b></p> <p>This shows an overview of the area surrounding Slochd Mhuic Trib looking along the A9 where the land rises steeply to Torr Mor directly above to the southwest and up to Cairn nam Bain-tighearna on the northeast. An existing A9 drainage chamber / culvert, drains the steep cutting on the southbound side of the road. Flows are ephemeral.</p>	
<p><b>Allt Cosach</b></p> <p>Allt Cosach is a small tributary of the River Findhorn with a catchment area of 3.8km<sup>2</sup> and is located within 150m of the Proposed Scheme. It flows northwest, roughly parallel with the existing A9 for approximately 400m and converges with the River Findhorn approximately 3km downstream at NGR NH 806 287.</p>	

River Description	Photograph
<p><b>Allt Cosach Trib 1</b></p> <p>The Allt Cosach Trib 1 is a small artificial drainage channel with a catchment area of &lt;math&gt;&lt;0.1\text{km}^2&lt;/math&gt;, located between the HML and the A9 carriageway, originating approximately 1.2km northwest of Slochd Summit. It flows northwest between the road and railway and is then crossed by the existing side road rail bridge before it converges with the Allt Cosach at NGR NH 823 262.</p> <p>This watercourse is likely to be affected by existing road/rail discharges.</p>	
<p><b>The River Findhorn</b></p> <p>The River Findhorn is one of the longest rivers in Scotland, with headwaters rising in the Monadhliath Mountains at 940m AOD (above Ordnance Datum), approximately 23km southwest of Slochd, flowing generally northeast to the Moray Firth. The catchment drains a total area of 786km (based on catchments derived from the Flood Estimation Handbook) with the Proposed Scheme interacting indirectly via the Allt Cosach tributary.</p> <p>The upper reaches of this catchment drain land characterised by upland landscapes such as open moorland and conifer plantation forestry, with channel morphology often of steep gradient and typically flashy.</p> <p>The River Findhorn is crossed by the existing A9 dual carriageway at NGR NH 808 290, approximately 200m downstream of the Findhorn Viaduct HML crossing. In this area the River Findhorn is characterised by a meandering, moderate gradient channel, wide floodplain, cobble, gravel and boulder bed, and pool and riffle sequences. At the existing A9 carriageway crossing location, the channel width is approximately 20m.</p>	



## 2.4 Surface Water Flow Patterns

- 2.4.1 Surface water drainage patterns in the study area include a number of small artificial drainage channels and minor natural watercourses which drain to larger watercourses, including the main channels of the River Spey and River Findhorn. Watercourse flow values vary depending on the size of watercourse catchment, seasonality and due to characteristics within each catchment, such as rainfall, and underlying soils and geology.
- 2.4.2 Two notable SEPA gauging stations are located downstream of the Proposed Scheme. The River Spey at Boat of Garten (NGR NH 946 192) is located approximately 9.5km downstream from the Proposed Scheme, and has a hydrological catchment area of 1267.8km<sup>2</sup>. The River Dulnain at Balnaan Bridge (NGR NH 977 247) is located approximately 11km downstream of the Proposed Scheme crossing location of the River Dulnain, and has a hydrological catchment of 272.2km<sup>2</sup>. NRFA gauged data<sup>iv</sup> for the Spey at Boat of Garten reports a mean flow of 29.33m<sup>3</sup>/s and a Q95 low flow (i.e. the flow exceeded 95% of the time) of 8.55m<sup>3</sup>/s and for the Dulnain at Balnaan Bridge a mean flow of 6.04m<sup>3</sup>/s, and Q95 of 1.1m<sup>3</sup>/s, as shown in Table 2.3.
- 2.4.3 For the smaller ungauged watercourses within the study area theoretical runoff rates have been estimated for the full extent of each defined stretch of catchment, i.e. for the flow of the Allt-na-Criche (Lynwilg) upstream of the existing A9 crossing location.. Low flow measurements have been determined from the LowFlows 2 software and are quoted as Q95 (i.e. the flow exceeded 95% of the time). Mean flows have also been determined from the LowFlows 2 software. This data is shown in Table 2.3. Note that the Northern Avie Lochan Burn is too small for a catchment size to be derived using FEH software to enable subsequent flow calculations.

**Table 2.3: Estimated Watercourse Flow Values**

Watercourse	Approx. Catchment Area (km <sup>2</sup> )	Mean Flow Q <sub>mean</sub> (m <sup>3</sup> /s)	Low Flow Q <sub>95</sub> (m <sup>3</sup> /s)
River Spey at Boat of Garten	1268	29.33*	8.55*
Allt an Fhearna	22.4	0.50	0.106
Allt Chrìochaidh	2.9	0.07	0.018
Caochan Ruadh	1.8	0.04	0.009
Ballinluig Burn	1.1	0.02	0.004
Allt-na-Criche (Lynwilg)	6.2	0.14	0.036
Aviemore Burn	7.3	0.15	0.025
Easter Aviemore Burn	1.4	0.02	0.004
Allt na Criche (Granish)	3.0	0.06	0.011
Avie Lochan Burn South	1.5	0.03	0.005
Allt Cnapach	1.2	0.02	0.005
Feith Mhor	12.1	0.16	0.031
River Dulnain at Balnaan Bridge	272	6.04*	1.1*
Allt nan Ceatharnach	17.2	0.35	0.045
Bogbain Burn	6.4	0.13	0.017
Allt an Aonaich	21.1	0.43	0.069
Slochd Mhuic	7.3	0.15	0.023
Allt Cosach	3.8	0.07	0.010
River Findhorn at Shenachie	415	14.04	2.13

- 2.4.4 The Hydrology of Soil Types (HOST) is a hydrologically-based classification of soils on the basis of their physical properties and their effects on the storage and transmission of water. It makes use of the fact that the physical properties of soils have a major influence on the hydrological response of a catchment. Other parameters can then be derived from the HOST classification. For the purposes of hydrological assessment, the Baseflow Index (BFI) and Standard Percentage Runoff (SPR) are the most useful parameters. BFI is the long-term ratio of baseflow to total stream flow, where baseflow represents the contribution to total flow from groundwater. BFI values range from 0.1 in relatively impermeable clay catchments to 0.99 in highly permeable chalk catchments. A very low BFI of 0.15 represents a flashy catchment with minimal storage, low BFI values (e.g. 0.3) indicate a catchment with little storage and active runoff, a BFI of 0.7 (or greater) indicates a significant contribution to flow from a major aquifer. SPR is the average percentage of rainfall that causes the short-term increase in flow seen at a catchment outflow following a storm event.
- 2.4.5 Using the Flood Estimation Handbook, the watercourses noted in Table 2.3 have BFI-HOST values ranging between 0.325 – 0.668, with the smaller watercourses generally exhibiting values at the lower end of this range. These outcomes indicate moderate contribution from stored water sources, such as underlying sands and gravels. Smaller watercourses will respond fairly quickly to rainfall events, with a moderate lag time between rainfall occurring and increased stream flow values.
- 2.4.6 The SPR value for the same watercourses range from 29.6 - 53.7%, indicating a moderately flashy response to rainfall, attenuated by local conditions, potentially including forestry cover. The smaller watercourses generally exhibit the greater SPR values, indicating the local geological conditions are less permeable (including underlying peatland) and are more likely to be affected by flash rainfall events. This is typical for smaller watercourses draining the higher altitude areas of upland catchments, which tend to have steeper channel gradients and demonstrate rapid response in flow conditions during and following heavy rainfall events (known as ‘flashy’).

## 2.5 Standing Water

- 2.5.1 Details of the standing waters within the study area are summarised in 2.4.

**Table 2.4: Standing Water Descriptions**

Standing Water Description
<p>Loch Beag</p> <p>Loch Beag is a small standing water body with a surface area of approximately 32,000m<sup>2</sup> (0.03km<sup>2</sup>) located within the Alvie SSSI, upstream to Loch Alvie, centred on NGR NH 861 093. The loch is drained by a small outflow on its north western shore, approximately 490-500m southeast of the Proposed Scheme, which discharges to Loch Alvie 60m downstream.</p>
<p>Loch Alvie</p> <p>The largest standing water body in the study area is Loch Alvie with a surface area of 600,000m<sup>2</sup> (0.6km<sup>2</sup>). The loch and its surrounding area is designated as SSSI and is located southeast of the existing A9 carriageway with the B9152 road and HML positioned immediately to its southeast. The loch is situated within 10m of the Proposed Scheme at its closest point.</p> <p>The Proposed Scheme crosses several inflows to Loch Alvie including the Allt an Fhearna, Allt Chriochaidh, Ballinluig Burn and Caochan Ruadh. Loch Alvie has a small outflow channel in the southeast at Alvie Bridge (NGR NH 871 093) called the Allt Dibheach. This flows east to a small lochan (known as Bogach), located within a larger area of bog before draining to the north and discharging to the River Spey at NGR NH 884 101.</p>
<p>Bogach</p>

### Standing Water Description

Bogach is a small standing water body with a surface area of 61,000m<sup>2</sup> (0.06km<sup>2</sup>) and is centred on NGR NH 881 096, within a shallow marshland area located within the Alvie SSSI. The water body is 1.1km downstream of Loch Alvie and is approximately 300m to the southeast of the Proposed Scheme. The water body is drained by several small watercourses which collect on the northern shore of the marshland and flow northeast to converge with the River Spey at NGR NH 884 101, approximately 300m downstream.

#### Loch Puladdern and Tributary Loch

Loch Puladdern and a connected unnamed loch are situated within the Craigellachie National Nature Reserve and SSSI. Loch Puladdern is centred on NGR NH 891 121 and has a surface area of approximately 8,000m<sup>2</sup> (0.008km<sup>2</sup>). The eastern extent borders the existing A9 northbound carriageway embankment which forms the shoreline, with a culvert inlet and a road drainage outfall pipe located in the vicinity of NGR NH 891 121. The culvert outlet drains to a small pond which is centred on NGR NH 892 121, in the grounds of the MacDonald Resort.

The unnamed water body to the northwest (centred on NGR NH 888 124) of Loch Puladdern drains via a small unnamed watercourse, flowing east then south, approximately 270m away to converge with Loch Puladdern at NGR NH 891 122. This unnamed water body has a surface area similar to that of Loch Puladdern and is located 170m west of the Proposed Scheme.

#### Avie Lochan

Avie Lochan is a small water body with a surface area of approximately 70,000m<sup>2</sup> (0.07km<sup>2</sup>), centred on NGR NH 907 165, approximately 200m east of the existing A9 southbound carriageway but only 90m east of associated A9 road works. The loch is split by the existing A95 in its south western extent, with the small hamlet of Avielochan situated on its northern shoreline. Two small watercourses, flowing east from their sources on the north eastern slopes of An Leth-chreag, are crossed by the existing A9 carriageway at NGR NH 902 164 and NGR NH 904 167, and discharge into the loch on the northwest and southwest shorelines.

#### Loch Vaa

Loch Vaa is designated as a SPA and a SSSI, and is located approximately 220m east of the existing A9 carriageway. The loch is centred on NGR NH 914 175 and has a surface area of approximately 158,000m<sup>2</sup> (0.16km<sup>2</sup>). The loch is surrounded by dense forestry with no significant tributaries or outflows featured on OS mapping.

#### Loch Roid

Loch Roid is located approximately 600m northeast of the small settlement of Kinveachy and 720m east of the existing A9 carriageway at the nearest point. The loch has a surface area of approximately 30,000m<sup>2</sup> (0.03km<sup>2</sup>) with open moorland and forestry characterising the shoreline

#### Ponds

A number of undesignated ponds, each of less than 3000m<sup>2</sup> in surface area have been identified within 250m of the Proposed Scheme. Notable examples include a cluster of small ponds at Ballinluig, centred on NGR NH 862 101, located approximately 140m from the Proposed Scheme and a small pond in the grounds of the MacDonald Aviemore Resort (NGR NH 892 121) within 25m of the existing southbound A9 carriageway.

There are a number of ponds east of the A95 north of Aviemore, including Lochan Ban (NGR NH 903 151) as well as numerous small unnamed ponds. These ponds are likely to be supplied via a combination of surface runoff, direct rainfall and also from groundwater/spring flows, with specific inflows influenced by local conditions.

The nature conservation value of these ponds is judged to be of local importance (Chapter 11: Ecology and Nature Conservation). The flow attenuation value of these ponds is currently unknown, but they may provide a drainage or flood relief function.

## 2.6 Surface Water Quality

- 2.6.1 The WFD is a risk-based classification system. This highlights such issues as stream morphology and existing artificial structures in addition to chemical water quality and

ecological diversity. Heavily modified water bodies, which can no longer be considered to be natural, are classified on the basis of 'ecological potential'. The WFD applies to all surface waters but, for practical purposes, SEPA has defined a size threshold above which a river or loch qualifies automatically for characterisation. For lochs, the threshold is a surface area of 0.5km<sup>2</sup> and rivers must have a catchment area of 10km<sup>2</sup> or more. In addition to these larger water bodies, smaller waters have been characterised where there is justification by conservation interests and to meet the requirements of regulatory legislation such as for drinking water supplies. All surface water bodies have an objective to meet or exceed 'Good' overall status by 2027'.

- 2.6.2 One reach of the River Spey and of the River Findhorn, within the study area, have been characterised under WFD, with larger tributaries of the River Spey also characterised as outlined in Table 2.5 and shown in Figure 11.2. The WFD status of these water bodies is taken from the most recent data available on the SEPA website, year 2015.
- 2.6.3 Note that references to the Allt an Fhearna for the purpose of WFD status use the SEPA WFD Water Body spelling: Allt an Fearna.

**Table 2.5: Current Water Framework Directive Status of Surface Waters, 2016**

Hydrological Catchment	River Spey	Allt an Fhearna	Allt Dibheach	Allt Dibheach	River Dulnain	Feith Mhor	Allt nan Ceatharnach	Slochd Mhuic	River Findhorn
SEPA Water Body Name	River Spey – R. Feshie to R. Nethy	Allt na Fearna – u/s Loch Alvie	Loch Alvie	Allt na Fearna – d/s Loch Alvie	River Dulnain – lower catchment	River Dulnain – Feith Mhor	River Dulnain – Allt Ruighe Magaig	River Dulnain – Allt an Aonaich	River Findhorn – Tomatin to Garbole
Water Body Type	River	River	Lake/Loch	River	River	River	River	River	River
Water Body ID	23097	23126	100181	23125	23106	23113	23112	23110	23012
Heavily Modified	No	No	No	No	No	No	No	No	No
Overall status (2016)	Moderate	Good	Good	Good	Good	Good	Good	Good	Good
Overall ecology	Moderate	Good	Good	Good	Good	Good	Good	Good	Good
Physico-chem	High	Good	High	Good	High	High	High	High	Unreported
pH	High	Good	Unreported	Good	High	High	High	High	Unreported
Dissolved Oxygen	High	High	High	High	High	High	High	High	Unreported
Biological elements	Good	High	High	High	High	High	High	High	High
Fish	Good	High	Unreported	High	High	High	High	High	High
Fish ecology	Unreported	Unreported	Unreported	Unreported	High	Unreported	Unreported	Unreported	Unreported
Fish barrier	Good	High	High	High	High	High	High	High	High
Specific pollutants	Unreported	Unreported	Unreported	Unreported	Pass	Unreported	Unreported	Unreported	Unreported
Hydromorphology	Moderate	Good	Good	High	Good	Good	Good	Good	Good
Morphology	Moderate	Good	High	High	Good	Good	Good	Good	Good
Overall Hydrology	Moderate	High	Good	High	High	High	High	High	High



Hydrological Catchment	River Spey	Allt an Fhearna	Allt Dibheach	Allt Dibheach	River Dulnain	Feith Mhor	Allt nan Ceatharnach	Slochd Mhuic	River Findhorn
SEPA Water Body Name	River Spey – R. Feshie to R. Nethy	Allt na Fearna – u/s Loch Alvie	Loch Alvie	Allt na Fearna – d/s Loch Alvie	River Dulnain – lower catchment	River Dulnain – Feith Mhor	River Dulnain – Allt Ruighe Magaig	River Dulnain – Allt an Aonaich	River Findhorn – Tomatin to Garbole
Hydrology (medium/high flows)	Moderate	High	n/a	High	High	High	High	High	High
Hydrology (low flows)	Moderate	High	n/a	High	High	High	High	High	High

- 2.6.4 As shown in Table 2.5, the majority of the local water bodies have been classified as having 'Good' status, with the exception of the River Spey (River Feshie to River Nethy) which has been classified as Moderate due to morphological alterations to the bed and banks of the watercourse.
- 2.6.5 For water bodies that have not been classified, the normal convention is to assume a classification based on downstream or adjacent water bodies, unless there are specific indications to the contrary. On this basis the Allt Chriochaidh, Caochan Ruadh and the Ballinluig Burn are considered to have Good status as per Loch Alvie.
- 2.6.6 Similarly, the Allt-na-Criche (Lynwilg), Aviemore Burn and the Shieling / Easter Aviemore Burn are considered to have Moderate status as per the River Spey. This is considered an appropriate assessment as each burn has an element of morphological alteration, in similarity to the River Spey.
- 2.6.7 The Allt na Criche (Granish), the Avie Lochan Burns, and the Allt Cnapach, do not drain to a WFD classified surface waterbody as they drain to groundwater, in some cases via unclassified lochs or ponds. In this instance it is assumed that these watercourses have Good status, given their rural location and relatively unmodified appearance.
- 2.6.8 The Bogbain Burn, Slochd Mhuic and Allt Cosach are each considered to have Good status, based on the status of their respective downstream watercourses.
- 2.6.9 Watercourses in the Study Area have been identified as ranging from Low to Very High sensitivity in relation to water quality.
- 2.6.10 Hydromorphological sensitivity has been evaluated based on the A11.2 Hydromorphology Assessment, which applies the Sensitivity Criteria provided in Section 10.2 and with reference to the SEPA hydromorphology classification under the WFD. Individual watercourses in the study area have sensitivities ranging from Low to High.
- 2.6.11 Standing water bodies including lochs, lochans, and larger ponds have been evaluated taking into account their designated status and WFD status as outlined in the Sensitivity Criteria, and in some cases have been assigned to a WFD status based on nearby water bodies' classifications, where appropriate. On this basis, such standing water bodies in the Study Area are considered High to Very High sensitivity.



**Table 2.6: Surface Water Quality Sensitivity Summary**

Receptor	Comment	Sensitivity
River Spey	'Moderate' Overall WFD Status. River Spey SAC.	Very High
Allt an Fhearna	'Good' Overall WFD Status. Within Alvie SSSI, drains to Loch Alvie.	High
Allt Chrioichaidh	Not classified by SEPA. Within Alvie SSSI, drains to Loch Alvie	High
Ballinluig Drain	Not classified by SEPA. A very small field drain on the northbound side of the A9 carriageway, joins a roadside drainage ditch, likely to be ephemeral flow.	Low
Caochan Ruadh	Not classified by SEPA. Within Alvie SSSI, drains to Loch Alvie.	High
Ballinluig Burn	Not classified by SEPA. A small watercourse draining agricultural land. Heavily modified surrounding A9 crossing and track crossing downstream, drains to Loch Alvie.	Medium
Lynwilg Drain 1	Not classified by SEPA. An existing A9 drainage culvert. Flows likely ephemeral.	Low
Lynwilg Drain 2	Not classified by SEPA. An existing A9 drainage culvert. Flows likely ephemeral.	Low
Allt-na-Criche (Lynwilg)	Not classified by SEPA. River Spey SAC.	Very High
Kinakyle Drain	Not classified by SEPA. An existing A9 drainage culvert. Flows ephemeral.	Low
Birch View Drain	Not classified by SEPA. A small hillside watercourse draining wooded area on the northbound side of the A9 carriageway, joins a roadside drainage ditch.	Low
Aviemore Drain 1	Not classified by SEPA. An existing A9 drainage chamber / culvert conveying flows from a drainage ditch on the northbound side of the road. Flows ephemeral.	Low
Aviemore Drain 2	Not classified by SEPA. An existing A9 drainage chamber / culvert conveying flows from a drainage ditch on the northbound side of the road. Flows ephemeral.	Low
Aviemore Drain 3	Not classified by SEPA. An existing A9 drainage chamber / culvert conveying flows from a drainage ditch on the northbound side of the road. Flows ephemeral.	Low
Milton Drain 1	Not classified by SEPA. An existing A9 drainage culvert. Flows ephemeral. Likely to be affected by existing A9 drainage and diffuse pollution.	Low
Aviemore Burn	Not classified by SEPA. A large watercourse draining forestry and moorland via several smaller tributaries on steep slopes to the west, before the A9 crossing where it is heavily and extensively modified on the fringe of the town of Aviemore. The watercourse is likely to be affected by existing A9 road drainage outfalls and sources of diffuse pollution related to forestry, surface runoff and sewage discharges.	Medium

Receptor	Comment	Sensitivity
Milton Drain 2	Not classified by SEPA. An existing A9 drainage culvert. Flows ephemeral. Likely to be affected by existing A9 drainage and diffuse pollution.	Low
Milton Drain 3	Not classified by SEPA. An existing A9 drainage culvert. Flows ephemeral. Likely to be affected by existing A9 drainage and diffuse pollution.	Low
Easter Aviemore Burn	Not classified by SEPA. A small watercourse draining a forested area on the north west fringe of Aviemore, flowing south east and is crossed by the A9 carriageway. It likely to be affected by existing A9 drainage and diffuse pollution.	Medium
Granish Drain 1	Not classified by SEPA. An existing A9 drainage chamber / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Granish Drain 2	Not classified by SEPA. An existing A9 drainage chamber / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Southern bifurcation of Allt na Criche (Granish)	Not classified by SEPA. A small watercourse draining slopes to the west of the A9. The channel is a bifurcation of the Allt na Criche (Granish) watercourse which has been historically modified. It is likely to be affected by existing A9 road drainage and diffuse pollution relating to agriculture. There is one private water supply located approximately 100m upstream of the existing crossing associated with Granish farm and is used only for agricultural purposes.	Medium
Granish Drain 3	Not classified by SEPA. An existing A9 drainage chamber / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Northern bifurcation of Allt na Criche (Granish)	Not classified by SEPA. A small watercourse draining slopes to the west of the A9. The channel is a bifurcation of the Allt na Criche (Granish) watercourse with lack of a distinct channel as it flows through poached agricultural land. It is likely to be affected by existing A9 road drainage and diffuse pollution relating to agriculture. It has been extensively modified in the area surrounding the A9 crossing, including a long culverted section.	Medium
Allt na Criche (Granish)	Not classified by SEPA. A small watercourse draining slopes to the west of the A9. This is the main stem channel associated with the above bifurcated channels and has been historically heavily modified. It is likely to be affected by existing A9 road drainage and diffuse pollution relating to agriculture.	Medium
Avielochan Drain 1	Not classified by SEPA. An existing A9 drainage chamber / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Southern Avie Lochan Burn	Not classified by SEPA. A small watercourse draining slopes to the west of the A9. There is one private water supply sourced from just upstream of the existing A9 crossing and is the only water supply for the single property it serves. The watercourse is likely to be affected by existing road drainage downstream of the crossing.	High
Avielochan Drain 2	Not classified by SEPA. An existing A9 drainage culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Northern Avie Lochan Burn	Not classified by SEPA. A small watercourse draining steep slopes to the west of the A9. Likely to be affected by existing A9 drainage. There is one private water supply sourced from just upstream of the existing A9 crossing.	Medium

Receptor	Comment	Sensitivity
Avielochan Drain 3	Not classified by SEPA. An existing A9 drainage chamber / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Avielochan Drain 4	Not classified by SEPA. An existing A9 drainage chamber / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Laggantygown Drain 1	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Laggantygown Drain 2	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Laggantygown Drain 3	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Loch Vaa Drain 1	Not classified by SEPA. An existing A9 ditch / drainage culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Loch Vaa Drain 2	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Allt Cnapach Drain 1	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Allt Cnapach	Not classified by SEPA. A small watercourse draining forestry on the slopes to the west of the existing A9 and HML railway crossings. It is likely to be affected by existing road and rail drainage.	Medium
Kinveachy Drain 1	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 and HML railway drainage.	Low
Kinveachy Drain 2	Not classified by SEPA. An existing A9 drainage basin / outfall. Flows ephemeral. Likely to be affected by existing A9 and HML railway drainage.	Low
Kinveachy Drain 3	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 and HML railway drainage.	Low
Docharn Drain	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 and HML railway drainage.	Low
Feith Mhor Drain 1	Not classified by SEPA. An existing A9 drainage ditch. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Feith Mhor Drain 2	Not classified by SEPA. An existing A9 drainage ditch. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Feith Mhor	'Good' Overall WFD Status	High

Receptor	Comment	Sensitivity
Feith Mhor Trib 1	Not classified by SEPA. An ephemeral field drain on the east side of the A9. Likely to be affected by existing A9 and HML railway drainage.	Low
Feith Mhor Drain 3	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Feith Mhor Trib 2	Not classified by SEPA. A very small tributary of the Feith Mhor draining forestry and marshy grassland surrounding the existing a9 crossing. Likely to be affected by existing A9 and HML railway drainage.	Medium
Feith Mhor Drain 4	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Feith Mhor Drain 5	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Feith Mhor Drain 6	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows likely to be ephemeral. Likely to be affected by existing A9 drainage.	Low
Feith Mhor Drain 7	Not classified by SEPA. A small field / forest drain originating from a flat area of marshy grassland on the west side of the A9. Flows likely to be ephemeral. Likely to be affected by existing A9 drainage.	Low
Carrbridge Drain 1	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows likely to be ephemeral. Likely to be affected by existing A9 drainage.	Low
Carrbridge Drain 2	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows likely to be ephemeral. Likely to be affected by existing A9 drainage.	Low
River Dulnain	'Good' Overall WFD Status. River Spey SAC.	Very High
Ceatharnach Trib	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows likely to be ephemeral. Likely to be affected by existing A9 drainage.	Low
Allt nan Ceatharnach	'Good' Overall WFD Status. River Spey SAC.	Very High
Ceatharnach Drain	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows likely to be ephemeral. Likely to be affected by existing A9 drainage.	Low
Bogbain Trib	Not classified by SEPA. A small forest drain flowing from south west to north east and is crossed by the A9 and the HML railway. Flows are likely to be ephemeral. Likely to be affected by existing A9 and railway drainage.	Medium
Bogbain Drain	Not classified by SEPA. An existing A9 drainage ditch. Flows likely to be ephemeral. Likely to be affected by existing A9 drainage.	Low
Bogbain Burn	Not classified by SEPA. A large watercourse draining forestry and open moorland surrounding the HML railway. Likely to be affected by existing railway drainage.	Medium

Receptor	Comment	Sensitivity
Black Mount Drain 1	Not classified by SEPA. A small forest drain crossed by the A9. Flows are likely to be ephemeral. Likely to be affected by existing A9 drainage.	Low
Black Mount Drain 2	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by existing A9 drainage.	Low
Slochd Drain 1	Not classified by SEPA. A small drain crossed by the A9 and side road, originating from forestry on the southbound side of the road. Likely to be affected by A9 drainage.	Medium
Slochd Drain 2	Not classified by SEPA. A small drain crossed by the A9 and side road, originating from forestry on the southbound side of the road. Likely to be affected by A9 drainage.	Medium
Slochd Drain 3	Not classified by SEPA. A small drain crossed by the A9 and side road, originating from forestry on the southbound side of the road. Likely to be affected by A9 drainage.	Medium
Slochd Drain 4	Not classified by SEPA. A small drain crossed by the A9 and side road, originating from forestry on the southbound side of the road. Likely to be affected by A9 drainage.	Medium
Slochd Drain 5	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by A9 drainage.	Low
Slochd Mhuic	Not classified by SEPA. This watercourse drains the steep slopes at Slochd either side of the A9 and flows south east along the edge of the road and is crossed several times. It is likely to be affected by existing road drainage.	Medium
Slochd Drain 6	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by A9 drainage.	Low
Slochd Drain 7	Not classified by SEPA. An existing A9 drainage ditch / culvert. Flows ephemeral. Likely to be affected by A9 drainage.	Low
Slochd Mhuic Trib	Not classified by SEPA. An existing A9 drainage chamber / culvert, drains the steep cutting on the southbound side of the road. Flows ephemeral. Likely to be affected by A9 drainage.	Low
Allt Cosach Trib 1	Not classified by SEPA, likely to be affected by existing road and rail discharges. A small headwater/existing A9 PED drain crossed by the Highland Main Line railway.	Low
Allt Cosach	Small burn draining moorland and rough grazing, runs parallel to the A9, C1121 and HML. Not classified by SEPA. Likely to be affected by existing road and rail discharges.	Medium
The River Findhorn	'Good' Overall WFD Status (River Findhorn – Tomatin to Garbole)	High

- 2.6.12 There is no specific water quality data available for the local ponds found within the study area. However, Chapter 12 considers all the ponds surveyed to hold biodiversity value of up to Local level, therefore it is assumed that water quality is of a reasonable quality although anthropogenic pressures are likely.

## 2.7 Water Supplies, Abstractions and Discharges

### Public Water Supplies

- 2.7.1 The public water supply for the study area has a groundwater source and is considered in Chapter 9: Geology, Soils and Groundwater. Within the study area, there were no Scottish Water surface water supply sources identified.
- 2.7.2 A distribution network and a number of Distribution Service Reservoirs (DSRs) for public supply to local properties are present in the study area. This is addressed further within the Utilities section of the Engineering Assessment.

### Private Water Supplies

- 2.7.3 Private water supplies identified to date within 1km of the Proposed Scheme and up to 5km downstream are shown on Figure 11.1 and presented in Table 2.7. The sensitivity of the private water supply sources has been based on the number of properties served. A number of supplies have been confirmed as groundwater sources, with these impacts considered further in Chapter 10: Geology, Soils and Groundwater.
- 2.7.4 Comments have been provided for each supply based on professional judgement, for example, it is likely that surface water supplies are fed from a source up-hill from a property. Sensitivity has been evaluated on the basis of the criteria identified in Section 11.2. Those supplies with justification for not being considered further in this assessment have been further identified as not applicable ('n/a') in the supply sensitivity column.
- 2.7.5 All private water supplies within the study area are located within the River Spey surface water catchment.

**Table 2.7: Private Surface Water Supplies Located Within 1km of the Proposed Scheme and 5km Downstream**

Source Name, Grid Reference and Sub-Catchment	Source Type	Properties Supplied and Estimated no. of Properties Served	Property Grid Reference	Comment and Screening Decision	Screening Result	Sensitivity
PWS Dalraddy (known locally as PWS Alvie Manse)  NH 853 098  Allt Chrochaidh	Surface water abstraction	Supplies three properties: Alvie Manse Wester Dalraddy Cottage Easter Dalraddy Cottage	NH 863 093 NH 864 092 NH 855 087	The source is located on the Allt Chrochaidh, approximately 430m north-east and upstream of the Proposed Scheme. Due to the existing A9 route being located between the source and the properties that the source supplies, pipework for the supplies will pass under the existing A9 route and have the potential to be disrupted as part of the works (this is considered in the Engineering Assessment).  As the source is considered to be hydrologically disconnected from the Proposed Scheme, due to the intervening topography, it is considered that the source will be unaffected by the Proposed Scheme.	Screened out	N/A
PWS Granish  NH 895 815 (holding tank)  Allt na Criche Granish	Surface water abstraction	Supplies one property: Granish Farm	NH 898 144	The exact source location is unknown. However, the nearest source is known to be upstream of the supply holding tank, which is located 100m west and upstream of the Proposed Scheme. Due to the existing A9 route being located between the source and the properties that the source supplies, pipework for the supplies will pass under the existing A9 route and have the potential to be disrupted as part of the works (this is considered in the Engineering Assessment).  As the source is considered to be hydrologically disconnected from the Proposed Scheme, due the intervening topography, it is considered that the source will be unaffected by the Proposed Scheme.	Screened out	N/A
PWS Eilan Cottage  NH 902 164	Surface water abstraction	Supplies one property: Eilan Cottage	NH 906 164	The source is located on an unnamed watercourse, within the Proposed Scheme footprint, featuring a new ditch parallel to the A9 northbound. Due to the existing A9 route being located between the source and the property that the source supplies, pipework for the supply will pass under the existing A9 route and have the potential to be disrupted as part of the works (this is considered in the Engineering Assessment).	Screened in	High

Source Name, Grid Reference and Sub-Catchment	Source Type	Properties Supplied and Estimated no. of Properties Served	Property Grid Reference	Comment and Screening Decision	Screening Result	Sensitivity
Avie Lochan Burn South				It is considered that the supply may have to be relocated, due to the supply being within the Proposed Scheme footprint.		
PWS Avielochan NH 903 168 Avie Lochan Burn North	Surface water abstraction	Supplies one property: Avielochan Farm	NH 904 167	The source is located on an unnamed watercourse, within the Proposed Scheme footprint, featuring a new ditch parallel to the A9 northbound. Due to the existing A9 route being located between the source and the property that the source supplies, pipework for the supplies will pass under the existing A9 route and have the potential to be disrupted as part of the works (this is considered in the Engineering Assessment).  It is considered that the supply may have to be relocated, due to the supply being within the Proposed Scheme footprint.	Screened in	High
PWS West Foregin NH 869 252 Bogbain Burn	Surface water abstraction	Supplies one property: West Foregin	NH 871 250	The source is located on the Allt na Criche, approximately 1.16km upstream of the Proposed Scheme and separated from the Proposed Scheme by Bogbain Burn and a railway line.  As the source is considered to be hydrologically disconnected from the Proposed Scheme, due to the intervening topography, it is considered that the source will be unaffected by the Proposed Scheme.	Screened out	N/A



2.7.6 As can be seen from Table 2.7, a number of the local private water supplies have been eliminated from further assessment, due to lack of hydrological linkage, intervening distance and topography between source and the Proposed Scheme.

## 2.8 SEPA Registered Abstractions and Discharges

2.8.1 A number of abstraction and discharge locations have been identified within 1km of the Proposed Scheme and 5km downstream for surface water abstractions in order to focus on locations with potential hydrological linkage. This is based on information provided by SEPA of licensed locations under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR), and The Waste Management Licensing (Scotland) Regulations 2011.

2.8.2 There are three levels of activity under the CAR<sup>ix</sup>, based on the type and scale of activity. These include:

- General Binding Rules – these are low risk activities which do not need to be notified to SEPA. Therefore they are not included within the dataset below;
- Registrations – these are medium risk activities where SEPA can monitor cumulative impacts and set additional conditions if required; and
- Licence (Simple and Complex) – these are high risk activities which contain site specific conditions and identification of a responsible person to ensure compliance of required conditions. ‘Simple’ and ‘Complex’ licences vary depending upon activity size and risk.

2.8.3 Within the SEPA dataset, licences are listed as ‘Simple Licence’ and ‘Licence’. Unless stated otherwise, any activity listed as ‘licence’ is considered to be a ‘Complex Licence’.

2.8.4 A total of 181 CAR licensed activities were identified, located within 1km of the Proposed Scheme, including up to 5km downstream for surface water abstractions. These include both domestic and industrial uses for both abstractions from and discharges to the water environment within the River Spey and River Findhorn catchments. These are summarised in Table 2.8, by licence type and activity.

**Table 2.8: CAR Licensed Activities within 1km of the Proposed Scheme, including Surface Water Abstractions up to 5km Downstream**

CAR Activity Type	Regulatory Level			
	Licence (Complex)	Simple Licence	Registration	Total
Disposal to Land	0	4	0	4
Engineering	5	13	4	22
Point Source	8	6	59	73
Water Resources	3	0	1	4
Unknown	8	8	62	78
<b>Total</b>	<b>24</b>	<b>31</b>	<b>126</b>	<b>181</b>

2.8.5 With reference to Table 2.8 there are a number of types of activity:

- Disposal to Land – there are four locations of sheep dip activity at Ballinluig Farm covered by a simple licence. These activities range from approximately 30m to 70m upstream of the Proposed Scheme.
- Engineering Activities include:

2.8.6 Registrations – there are four registrations for utilities crossing different watercourses including the River Spey and Milton Burn.

2.8.7 Simple licences – there are 13 simple licences: one boulder placement, one grey bank reinforcement, three removal of bank modifications, two removal of river/loch crossings, three croys/groynes/flow deflectors, two bridges, and one sediment removal. This includes one for river crossing of the Allt an Fhearna and one for in-stream boulder placements in the Steallan Dubh (Aviemore Burn), as part of previous engineering works located within the Proposed Scheme footprint. The remainder cover river crossings, bank modifications and in-stream structures in the Allt Lorgy catchment, between approximately 750m and 1.0km upstream of the Proposed Scheme; and, bank modifications of the River Dulnain, approximately 800m downstream of the scheme.

2.8.8 Complex licences – There are five complex licences: four pipeline/cable crossings and one bridging culvert at High Burnside for construction purposes.

- Point Source Discharge include 73 locations:
  - Registrations – there are 59 registrations for public and private sewage with five being located within the Proposed Scheme footprint at Ryna-Clarsach, Slochd; Red Stag Lodge, Granish; Birch View Kinakyle; Lowarch Cottage, Aviemore.
  - Simple licences – there are six simple licences, one relating to a Scottish Water potable water treatment outfall to a River Spey tributary, west of Inverdrue, with the remainder being for surface water drainage along the A9 between Dalraddy and Slochd, all of which are within the Proposed Scheme footprint.
  - Complex licences – there are eight complex licences, one of which relates to a fish farm at Rothiemurchus with the remainder relating to Scottish Water public sewerage assets. Two of the sewerage assets covered by these licences are located approximately 350m downstream of the Proposed Scheme on the Aviemore Burn, in Aviemore, and another sewerage asset is approximately 700m downstream.
- Water Resources include four locations (also summarised in Table 2.9, below):
  - Registrations – there is one registration for an abstraction near Lochan Ba at Granish Landfill site for industrial processes (approximately 65m downstream of the Proposed Scheme).
  - Complex licences – there are three complex licences which relate to one abstraction, one impoundment and one abstraction return at a fish farm at Rothiemurchus which is River Druie upstream the River Spey and any interaction with the Proposed Scheme. An additional complex licence has been identified relating to an abstraction location 2.9km downstream from the Proposed Scheme on the Allt Cosach, north west of Slochd Summit. This abstraction is associated with a hydropower station. Unknown – there are 78 CAR records of unknown activities.
  - Of the 62 registrations, the majority relate to private properties with the remainder relating to construction, business, mining and quarrying, and other utilities. There are eight simple licences relating to private properties, fisheries, infrastructure business, and utilities. There are eight complex licences relating to utilities, fish farming, and construction. Of the 78 records of unknown activities, there are 22

records within close proximity (100m) of the Proposed Scheme; 18 registrations and four simple licences. 16 of the registrations appear to be related to private contacts with the remaining two relating to construction and utilities. The four simple licences appear to relate to transport infrastructure and utilities. Five records of unknown activities have been identified as being located under the Proposed Scheme footprint. Two of these are registrations located close to Aviemore and are associated with a utility and a private contact. The other three are simple licences; two associated with transport infrastructure (Carrbridge and Slochd) and the other with Scottish Water utilities (in Upper Kinakyle near Aviemore).

**Table 2.9: Abstractions within 1km of the Proposed Scheme or within 5km Downstream**

Abstraction Name NGR Chainage Section	CAR Licence / Registration	Data Source	Abstraction Purpose	River Catchment and Relative Location	Supply Sensitivity
Rothiemurchus Fisheries, Aviemore NH 903 114	Licence CAR/L/1011437	SEPA	Fish Production	River Drurie – Abstraction is hydrologically disconnected from the Proposed Scheme.	n/a
Granish Landfill Site NH 901 149	Registration CAR/R/1012007	SEPA	Industrial or Commercial: Process Water	River Spey – Abstraction 270m downstream of the Proposed Scheme.	Medium
Altchosach Hydrostation NH 807 276	Licence CAR/L/1010493	SEPA	Hydropower	Allt Cosach (280721E, 827618N) - 2.9km downstream from the Proposed Scheme, north west of Slochd Summit.	Medium

2.8.9 A further five sites were identified under The Waste Management Licensing (Scotland) Regulations 2011; one of which relates to recycling activities at Granish, and the remaining four are exemptions relating to composting and recycling, and a Scottish Water WWTP, also in Granish.

2.8.10 There are also eight licences for Pollution Prevention Control permits, three of which relate to a landfill site, two to a batching plant in Granish, and the remaining three relate to a car dealership, a laundry and dry cleaning business in Aviemore.

**Table 2.10: Discharges within 1km of the Proposed Scheme**

Discharge Site Name and location (NGR)	Regulatory Level	Discharge Type	Relative Location	Receiving Water Body
Kincraig to Dalraddy NH 853 089	Simple Licence CAR/S/1130436	Upgrade engineering works	Approximately 300m south west of the proposed scheme footprint.	Allt an Fhearna
Kinakyle, Aviemore WTW NH 892 108	Simple Licence CAR/S/1058177	Backwash outfall	Approximately 300m to the southeast and downstream of the proposed scheme footprint.	Unnamed Tributary of River Spey
Boat House, Rothiemurchus NH 896 106	Registration CAR/R/1077186	Sewage (Private) Primary	Approximately 750m to the southeast and downstream of the proposed scheme footprint.	Milton Burn, Aviemore
Upper Kinakyle, Aviemore NH 894 120	Registration CAR/R/1046855	Sewage (Private) Primary	Approximately 350m to the southeast and downstream of the proposed scheme footprint.	River Spey
Inverdrue PS, Aviemore NH 898 115	Complex Licence CAR/L/1001766	Scottish Water Pumping Station Sewage (Public) Emergency Overflow	Approximately 645m to the east of the proposed scheme footprint.	River Drue
Inverdrue PS, Aviemore NH 899 115	Complex Licence CAR/L/1002696	Scottish Water Sewage (Public) Combined Sewer Overflow	Approximately 680m to the east of the proposed scheme footprint.	River Drue
Aviemore Caravan Site PS NH 895 115	Complex Licence CAR/L/1002673	Emergency Overflow to River Spey	Approximately 340m to the east and downstream of the proposed scheme footprint.	River Spey
Rothiemurchus Fish Farm NH 897 119	Complex Licence CAR/L/1002425	Final effluent	Approximately 310m to the east and downstream of the proposed scheme footprint.	River Drue
Aviemore South PS NH 898 124	Complex Licence CAR/L/1026256	Sewage (Public) Combined Sewage Overflow	Approximately 700m to the east and downstream of the proposed scheme footprint.	River Spey
Burnside Road NH 894 131	Complex Licence CAR/L/1026256	Sewage (Public) Combined Sewage Overflow	Approximately 190m to the east and downstream of the proposed scheme footprint.	Aviemore Burn

Discharge Site Name and location (NGR)	Regulatory Level	Discharge Type	Relative Location	Receiving Water Body
Craig Na Gower Avenue NH 894 132	Complex Licence CAR/L/1026256	Sewage (Public) Combined Sewage Overflow	Approximately 140m to the east and downstream of the proposed scheme footprint.	Aviemore Burn
Craig Na Gower Avenue NH 893 131	Complex Licence CAR/L/1026256	Sewage (Public) Combined Sewage Overflow	Approximately 170m to the east and downstream of the proposed scheme footprint.	Aviemore Burn
A9 Carrbridge Northbound NH 905 212	Simple Licence CAR/S/1033973	Surface water drainage	Within the proposed scheme footprint.	Feith Mhor Drain 7
A9 Carrbridge Northbound NH 906 213	Simple Licence CAR/S/1033973	Surface water drainage	Within the proposed scheme footprint.	Feith Mhor Drain 7
Slochd, Near A9/A938 Black Mount Junction NH 891 236	Simple Licence CAR/S/1082546	SuDS Outfall to Allt Ruighe Magaig (Allt nan Ceatharnach)	Within the proposed scheme footprint.	Allt nan Ceatharnach

## Existing Road Drainage Discharges

- 2.8.11 The existing A9 is understood to discharge unattenuated and untreated runoff, generally via kerbs, gullies and carrier pipes. It has not been possible to identify the location of the existing outfalls due to a lack of complete as-built drawings. However, it is anticipated that there are direct discharges into the majority of the local natural water bodies as well as indirectly via purpose built drainage ditches.

<sup>i</sup> Met. Office (2015) Northern Scotland: climate. Available at: <http://www.metoffice.gov.uk/climate/uk/ns/>. (Accessed 4 December 2015).

<sup>ii</sup> Met Office (2015) UK climate projections. Available at: <http://ukclimateprojections.metoffice.gov.uk/> (Accessed 4 December 2015).

<sup>iii</sup> SNH (2015) SNHi – Information Service, SiteLink. Available at: <http://gateway.snh.gov.uk/sitelink/index.jsp>. (Accessed 4 December 2015).

<sup>iv</sup> NRFA (2016) National River Flow Archive. Available at: <http://nrfa.ceh.ac.uk/> (Accessed 4 December 2015).

<sup>v</sup> SEPA (2010) Land Use Planning System SEPA guidance note 7; Guidance on the Water Framework Directive including river basin planning. Scottish Environment Protection Agency.