

## 20. Cumulative Effects

### 20.1. Introduction

- 20.1.1. This chapter presents an assessment of the potential for cumulative effects as a result of the Proposed Scheme, and those of the Proposed Scheme in combination with committed developments and other major proposed development projects, including other projects forming part of the A9 dualling programme.
- 20.1.2. Each of the assessments reported in Chapters 8 through to 19 of this ES have, where relevant, already taken into account the potential for cumulative effects within a specific topic area as a result of a number of different activities affecting a single receptor.
- 20.1.3. Traffic modelling (TMfS15) indicates that although individual A9 dualling projects are generally unlikely to notably affect the traffic demand at a local level, the cumulative effect of full implementation of the wider programme of A9 dualling works may be to increase traffic flows on the A9.
- 20.1.4. Traffic data utilised in this EIA include the traffic flow increase predicted as a consequence of implementing the full programme of works to dual the A9. This applies to the following chapters and assessments (thereby negating the need for further assessment):
- Chapter 9: People and Communities – All Travellers (NMUs and Driver Stress);
  - Chapter 11: Road Drainage and the Water Environment;
  - Chapter 16: Air Quality; and
  - Chapter 17: Noise and Vibration.

### 20.2. Approach and Methods

- 20.2.1. The assessment of cumulative effects has been carried out to fulfil the requirement to consider such effects, as set out in Schedule 4 (Part 1) of the EIA Regulations which pertains to information to be included in the Environmental Statement.
- 20.2.2. Two types of cumulative effects interactions have been considered in this chapter:
- Type 1 Cumulative Effects – the combined effect of a number of individual impacts arising as a result of the Proposed Scheme on a single sensitive receptor/resource.
  - Type 2 Cumulative Effects – the combined effects of the Proposed Scheme with other 'reasonably foreseeable' development schemes on a single sensitive receptor/resource.

#### Type 1 Cumulative Effects Assessment

- 20.2.3. The assessment of Type 1 cumulative effects is primarily focused upon the significant residual impacts summarised in Chapter 22 (Summary of Significant Residual Impacts) as these generally have the greatest potential to contribute to a significant cumulative effect. However, there is potential that multiple non-significant impacts, in combination, could result in a significant cumulative effect, and therefore all residual impacts were reviewed.
- 20.2.4. To consider the potential for a combined effect of different environmental topic-specific impacts on a single receptor/resource, a two-step process has been followed:

Step 1 – Review of the residual impacts from the individual topic assessments, as set out in chapters 8 to 19, where there is potential for interaction with other topic areas and subsequent identification of potential combined effects at sensitive receptors. Where the same sensitive receptor is identified, in relation to two or more individual topics, this receptor has been considered further at Step 2.

Step 2 - Consideration of the potential for resultant combined effects both during the construction and/ or operation of the Proposed Scheme. The relevant residual inter-topic impacts are grouped and, applying professional judgement, the potential for significant combined effects upon the receptors is assessed.

## Type 2 Cumulative Effects Assessment

- 20.2.5. Assessment of potential cumulative effects of the Proposed Scheme in combination with other reasonably foreseeable developments (Type 2 cumulative effects) has been carried out at two levels. The first being a high-level appraisal of potential inter-project (A9 Dualling Programme) cumulative effects and the second within a defined study area.
- 20.2.6. The following steps in the assessment were undertaken.
- Step 1 – Identification of ‘reasonably foreseeable’ developments. In accordance with DMRB HA205/08<sup>i</sup> ‘reasonably foreseeable’ is interpreted as projects that are ‘committed’ including:
    - trunk road and motorway projects which have been confirmed (i.e. gone through the statutory processes)
    - other relevant projects of the A9 dualling programme irrespective of status
    - committed developments with consented, or yet to be determined, planning applications, as granted by the local planning authority/authorities, and for which formal EIA is a requirement or for which non-statutory EIA has been undertaken to support the planning application
- 20.2.7. A review of other major developments beyond those that are ‘committed’ has also be undertaken to ascertain whether any should justifiably also be included in the assessment by virtue of their scale, location or timing.
- Step 2 – Consideration of potentially significant cumulative effects from identified ‘reasonably foreseeable’ developments. Once developments have been identified and agreed, professional judgement will be used to ‘scope out’ any of the developments that are not considered likely to have in-combination significant cumulative effects. For example, this may be based on location, type of development, development status. This will allow the assessment to focus on those ‘reasonably foreseeable’ developments that may potentially result in significant cumulative effects in combination with the Proposed Scheme.
  - Step 3 – Based on the ‘reasonably foreseeable’ developments identified as having the potential for significant Type 2 cumulative effects, a topic by topic consideration was carried out, relying on professional judgement to determine the potential for combined effects.
- 20.2.8. The study area was defined as up to 500m (based on professional judgement) from the Proposed Scheme for the purposes of initial identification of committed developments. However, a wider area search of additional projects that may contribute to a cumulative effect was then undertaken through review of planning information such as development plans (refer to Chapter 19: Policies and Plans), which included the projects of the A9 dualling programme.

20.2.9. Approved applications that have either lapsed or been completed are assessed as existing land use. However, where consultation with landowners and the planning authority has confirmed the presence of a planning application where development has been initiated but not completed this is included in the assessment.

### Assumptions and Limitations

20.2.10. The cumulative effects assessment has drawn upon currently available information on other 'reasonably foreseeable' developments, including planning applications registered with the local planning authorities and the other projects of the A9 dualling programme. It has not been possible to quantify potential cumulative effects in relation to the latter as the projects programmes vary and consequently not all projects are at the same stage of design development.

## 20.3. Potential Cumulative Effects

### Type 1 Cumulative Effects (of the Proposed Scheme)

20.3.1. The following section considers the potential combinations of environmental topic area impacts acting upon specific receptors during construction and operation.

#### Construction

20.3.2. Chapter 5 (The Proposed Scheme) provides currently available information regarding the timing/programming and type of construction activities anticipated. The specifics will be dictated by the Contractor(s) detailed design and construction methodology.

20.3.3. During construction, properties closest to the works may be subject to temporary disturbance such as noise and vibration and changes to air quality, visual impacts and access to/from properties.

20.3.4. Receptors with the greatest potential for Type 1 cumulative effects during construction are identified in Table 20.1 below.

**Table 20.1: Type 1 Cumulative Effects - Construction**

Receptor	Summary of Residual Significant Impacts with Potential for Interaction	Cumulative Effect
Druim Mhor (ch.2200)	Access disruption of local roads due to works associated with Aviemore South GSJ, a SuDS pond and access track and new underbridge works at CP1 – moderate  Moderate adverse visual impact.	Significant
Lynwilg Farm (ch.3000)	Access disruption of local roads due to works associated with Aviemore South GSJ, a SuDS pond and access track and new underbridge works at CP1 – moderate  Moderate-substantial adverse visual impact.	Significant
Kinakyle (ch.4300)	Local road travel disruption due to construction of rock trap ditch, remedial works to rock face south of Aviemore and improvement works to RoW HB83 – moderate  Moderate-substantial adverse visual impact.	Significant

Receptor	Summary of Residual Significant Impacts with Potential for Interaction	Cumulative Effect
Birch View (ch 4570)	Local road travel disruption due to construction of rock trap ditch, remedial works to rock face south of Aviemore and improvement works to RoW HB83 – moderate  Moderate-substantial adverse visual impact.	Significant
March Cottage (ch.4610)	Local road travel disruption due to construction of rock trap ditch, remedial works to rock face south of Aviemore and improvement works to RoW HB83 – moderate  Moderate-substantial adverse visual impact.	Significant
Kinmundy (ch.4730)	Local road travel disruption due to construction of rock trap ditch, remedial works to rock face south of Aviemore and improvement works to RoW HB83 – moderate  Moderate-substantial adverse visual impact.	Significant
NCN7 at Slochd (ch.23800)	Users of NCN7 – moderate  Moderate adverse visual impact.	Not Significant – (Effects on all travellers includes consideration of visual amenity impacts on NMUs.)

20.3.5. Construction activity has the potential to result in cumulative effects at 6 properties towards the southern end of the Proposed Scheme, as well as NCN7 at the northern end of the Proposed Scheme. Properties will experience significant residual impacts in terms of disruption to travel on local roads combined with significant residual visual impacts due to proximity to the works. Consequently, significant cumulative effects during the construction phase are predicted in relation to all 6 properties included in Table 20.1 above.

20.3.6. Because the assessment of Effects on All Travellers already includes consideration of visual amenity impacts on NMUs, the cumulative effect upon NCN7 is not considered significant.

20.3.7. The potential for a combination of non-significant construction phase residual impacts to result in a significant cumulative effect has also been considered but no other significant cumulative effects are predicted.

### *Operation*

20.3.8. One receptor has been identified as having the potential to be subject to a Type 1 cumulative effect during operation as set out in Table 20.2 below.

**Table 20.2: Type 1 Cumulative Effects - Operation**

Receptor	Summary of Residual Significant Impacts with Potential for Interaction	Cumulative Effect
Ballinluig Farm and Land Holding (LH)3 to LH5 (see Figure 8.3 sheets 1 & 2)	Permanent loss of better quality agricultural land of the estate (LCA 3.2 and 4.2) adjacent to A9 - Moderate / substantial Ballinluig Assessment Winter Year 1 (WY1) Moderate adverse visual impact Assessment Summer Year 15 (SY15) Negligible-slight adverse visual impact	Not Significant

- 20.3.9. The combination of significant loss of agricultural land and significant visual impacts has the potential to result in a significant cumulative effect for Ballinluig Farm, however, once mitigation planting becomes effective in Summer Year 15, visual impacts will reduce to negligible to slight adverse and therefore not significant. Based on the limited duration of the visual impact, the cumulative effect is therefore not considered to be significant.
- 20.3.10. Non-significant residual operational impacts have also been examined to determine the potential for a combination of such impacts to result in a significant cumulative effect, however, no effects of this nature have been identified.

### Type 2 Cumulative Effects (Other Developments)

- 20.3.11. The wider A9 dualling programme from Perth to Inverness has been included in the assessment of cumulative effects with a full list of projects provided in Table 20.4.
- 20.3.12. Other 'reasonably foreseeable' developments in the vicinity of the Proposed Scheme include a number of planning applications as summarised in Table 20.3.
- 20.3.13. Table 20.3 identifies which of these developments has been taken forward into the assessment of cumulative effects and outlines the rationale for selection (Figure 8.2 identifies the location of the developments included in the assessment).

**Table 20.3: Reasonably Foreseeable Developments**

Ref No. (THC/CNPA Application Ref.)	Development Description	Development Status	Considered in Assessment of Cumulative Effects
18/00315/FUL	Development Site on Former Filling Station Grampian Road Aviemore Erection of 32no apartments with associated works (amended design)	Pending determination	No (on the basis of development type and location)
18/00097/SCRE	Land South of Dalfaber Drive Aviemore Two storey Community Hospital facility, General Practitioner Surgery, Dental Surgery, and Community and Social Work facilities	Pre-application (non-EIA development)	No (on the basis of development status and location)
16/04604/FUL	Granish Quarry and Waste Recycling Centre Granish Aviemore	Pending determination	No

Ref No. (THC/CNPA Application Ref.)	Development Description	Development Status	Considered in Assessment of Cumulative Effects
	Extend mineral working area		(on the basis of type of development at existing facility)
2017/0463/DET	Land North West of Dalfaber Farm, Dalfaber Drive, Aviemore Application to satisfy Condition 2b of planning permissions PPA-001-2016 and PPA-001-2017 for 75 residential units	Pending determination	No (on the basis of development status and location)
16/02611/FUL	Land 30m West of 31 Allt Mor Aviemore Proposed 24 private flats, 8 private terrace units and 10 affordable units	Approved – 15/09/2017	Yes (on the basis of location adjacent to Proposed Scheme and status – consented but not constructed)
17/00659/FUL	Land 80m West of Aviemore News Grampian Road Aviemore Erection of class 1, 2 and 3 (with take away function) kiosks with associated adjusted car parking arrangements and ancillary works	Approved - 13/09/2017	No (on the basis of type of development)
17/0086/DET	An Camas Mor Inverdrue Aviemore Application under Section 42 to variation condition 1 of Planning Permission in Principle (CNPA Ref 09/155/CP) (1500 dwellings)	Approved – 18/08/2017	No (on the basis of development location)
16/0394/DET	Cairngorm Service Station Grampian Road Aviemore PH22 1PT Erection of 60 Bedroom Premier Inn Hotel with Associated Landscaping, Service Area and Car Parking	Approved – 03/05/17	No (on the basis of development status and location)
17/00855/FUL	Granish Farm Cottage Aviemore PH22 1QD Proposed replacement of existing farm cottage	Approved – 07/04/17	No (on the basis of type of development)
16/05650/FUL	Filling Station 62 Grampian Road Aviemore Highland Redevelopment of the whole facility with new below ground tanks, new canopy and new sales building	Approved – 02/02/17	No (on the basis of type of development and location)
5/00209/REMBS & 05/00207/FULBS	Horse Field (Land North of Scandinavian Village) Aviemore	Approved - 04/03/2008	Yes



Ref No. (THC/CNPA Application Ref.)	Development Description	Development Status	Considered in Assessment of Cumulative Effects
	5/00209/REMBS: Erection of 140 dwellings, construction of roads and services and landscaping 05/00207/FULBS: Erection of 21 houses, associated infrastructure and landscaping		(on the basis of location adjacent to Proposed Scheme and status – consented but only partially constructed)

### Construction

- 20.3.14. The A9 dualling construction programme and phasing of individual projects is not yet known, however the majority of the A9 programme is anticipated to be constructed from 2019 to 2025, with individual projects typically taking up to 4 years to complete, depending on size and complexity.
- 20.3.15. The findings of the assessment of Type 2 cumulative effects during construction is summarised in Table 20.4 below (with commentary below Table 20.4) and considered the following potential effects:
- Effects on people and property (disruption/disturbance, air quality, noise and vibration and visual effects);
  - Effects on vehicle travellers (views from the road);
  - Effects on long-distance NMU routes;
  - Effects on driver stress;
  - Effects on hydrological connections within the River Spey catchment (including water quality and flood risk); and
  - Effects on material resources (including embodied carbon) and waste generation.
- 20.3.16. An in-combination assessment of the effects of the Proposed Scheme with other plans and projects on Natura sites, including the River Spey Special Area of Conservation (SAC), is included in a separate Habitats Regulations Assessment (HRA). The HRA concluded that there will be no significant Type 2 cumulative effects.
- 20.3.17. Cumulative effects in terms of woodland/habitat loss are considered under operational cumulative effects, below.

**Table 20.4: Type 2 Cumulative Effects - Construction**

<b>Project</b>	<b>Description</b>	<b>Cumulative Effect (Construction Phase)</b>
A9 Dualling Project 01: Luncarty to Pass of Birnam	Already consented, construction scheduled to commence in 2018. Project 01 will be completed prior to commencement of the construction of the Proposed Scheme and is >100km south of the Scheme.	None
A9 Dualling Project 02: Pass of Birnam to Tay Crossing	Construction timing unconfirmed. Project 02 is approx. 98km south of the start of the Proposed Scheme.	None
A9 Dualling Project 03: Tay Crossing to Ballinluig	Construction timing unconfirmed. Project 03 is approx. 89km south of the start of the Proposed Scheme.	None
A9 Dualling Project 04: Pitlochry to Killiecrankie	Construction timing unconfirmed. Project 04 is approx. 78km south of the start of the Proposed Scheme.	None
A9 Dualling Project 05: Killiecrankie to Glen Garry	Construction timing unconfirmed. Project 05 is approx. 55km south of the Proposed Scheme.	None
A9 Dualling Project 07: Glen Garry to Dalwhinnie	Construction timing unconfirmed. Project 07 is approx. 33km south of the Proposed Scheme but within the River Spey catchment.	Not Significant
A9 Dualling Project 08: Dalwhinnie to Crubenmore	Construction timing unconfirmed. Project 08 is approx. 25km south of the Proposed Scheme but within the River Spey catchment.	Not Significant
A9 Dualling Project 09: Crubenmore to Kincaig	Construction timing unconfirmed. Project 09 is approximately 21km south of the Proposed Scheme but within the River Spey catchment.	Not significant
A9 Dualling Project 10: Kincaig to Dalraddy	Scheme completed 2017.	None
A9 Dualling Project 12: Tomatin to Moy	Construction timing unconfirmed. The southern end of Project 12 coincides with the northern end of the Proposed Scheme. However, the Project 12 scheme involves only minor works at the southern end with the start of the main construction works being approx. 5km north of the Proposed Scheme. Consequently, the same receptors are unlikely to be affected.	Not Significant
Horse Field Residential Development (Land North of Scandinavian Village, adjacent to the east of the Proposed Scheme) Aviemore	Erection of 140 dwellings, construction of roads and services and landscaping. Development is approximately 15% complete by number of dwellings.  There has been a hiatus of several years since completion of first phase of work and no further details are available as to when/if the development will resume.	Not Significant
Allt Mor Residential Development (Land adjacent to the east of the Proposed Scheme in the vicinity of High Burnside) Aviemore	Proposed 24 private flats, 8 private terrace units and 10 affordable units. Consented but not yet constructed.  Construction timing unconfirmed but expected to be completed prior to commencement of construction of the Proposed Scheme.	Not Significant



- 20.3.18. Construction impacts are generally localised and it is considered unlikely that individual receptors will be affected by multiple projects due to the degree of physical/geographical separation. This is particularly the case for the Proposed Scheme where there are essentially buffers between the neighbouring A9 dualling projects to the north (Project 12: Tomatin to Moy) and south (Project 9: Crubenmore to Kincaig), discounting Project 10 Kincaig to Dalraddy which has been completed. Consequently, no adverse cumulative effects in terms of localised disruption/disturbance, air quality, noise and vibration and visual effects are predicted.
- 20.3.19. There is the potential for several A9 dualling construction projects to run concurrently resulting in adverse cumulative effects on views from the road due to the presence of construction works and associated plant. However, this is not considered significant given that existing sections of dual carriageway segregate the Proposed Scheme which will provide the traveller with some degree of respite in the event that the northernmost schemes construction periods overlap. Similarly, if the Proposed Scheme was to be constructed at the same time as the other A9 dualling projects an adverse cumulative effect on driver stress could reasonably be predicted due to slower journeys and delays whilst traffic management is in operation.
- 20.3.20. Projects 07 (Glen Garry to Dalwhinnie) to Project 11 (the Proposed Scheme) are within the River Spey catchment, although no significant adverse cumulative effect is expected given the level of hydrological separation (e.g. the presence of Loch Insh upstream from Project 11) and dilution potential between the projects as well as the likelihood that not all projects will be constructed at the same time.

#### Long-distance NMU routes

- 20.3.21. National Cycle Network Route 7 (NCN7) broadly follows the A9 from the vicinity of Ballinluig to Inverness running in close proximity to the existing A9 within the extents of several A9 dualling projects north of Ballinluig. The Proposed Scheme involves realignment of NCN7 at Slochd and users will also be affected by construction works in the vicinity of Black Mount Junction. An adverse cumulative effect, although not significant, is predicted as several schemes including Project 12 (Tomatin to Moy) involve minor realignments to the NCN7 route and there is the potential that several of these works could coincide resulting in disruption to access by users.

#### Materials and Waste

- 20.3.22. The Proposed Scheme in combination with the other A9 projects will result in adverse significant (regional scale) cumulative effects in relation to carbon emissions (embodied carbon in materials used), natural resources depletion and waste generation.
- 20.3.23. Current data (as provided in Chapter 18: Materials) indicate that within The Highland and Moray and TAYPlan areas there is sufficient capacity to supply aggregate material for the Proposed Scheme. However, it is expected that most of the material can be sourced on site, minimising the requirement for importation of primary resources. Moreover, it is considered that a substantial proportion of the site won material from the other A9 dualling projects will also be suitable for reuse on-site.
- 20.3.24. Demand for off-site primary resources can be further reduced through the reuse of material from other sections of the A9 dualling project. A complete picture of materials balance from all projects is not currently available and therefore the degree to which materials demands could be satisfied across the projects cannot be ascertained at present.

- 20.3.25. On and off-site reuse for structural and non-structural uses will be the most likely management option for excess rock and concrete given the prevailing legislation and policy position and the resultant limited waste facility capacity for inert materials.

#### *Operation*

- 20.3.26. Potential Type 2 cumulative operational effects identified in this assessment comprise the following:
- Woodland loss (in particular, woodland listed on the Ancient Woodland Inventory (AWI));
  - Effects on private property (land-take from landholdings that span more than one project boundary);
  - Effects on long-distance NMU routes.

#### *Woodland Loss*

- 20.3.27. Throughout the iterative design process for each of the A9 dualling projects, avoidance, where possible, and minimisation of woodland loss has been at the centre of design development. Examples of ways in which this has been carried out include designing compact junction layouts with reduced footprints and by minimising the lateral extent of earthworks. Although loss of existing woodland has been reduced through sympathetic design, some degree of loss has been unavoidable on the majority of the A9 dualling projects given the array of environmental constraints to be taken into account along the entire route.
- 20.3.28. In accordance with Scottish Government policy<sup>ii iii</sup> each project has aimed to achieve no net loss of woodland and has set out proposals for 1:1 replacement woodland planting to counterbalance the loss. As part of this process woodland connectivity has been considered at both a project and programme level to ensure that current levels of connectivity are at least maintained and where possible enhanced (i.e. reducing fragmentation and augmenting functionality).
- 20.3.29. Whilst replacement planting will mitigate woodland loss over time as new trees become established, areas of mature woodland cited on the AWI have a particularly high intrinsic value and consequently these areas of woodland cannot be considered replaceable. Loss of woodland on the AWI is a significant residual impact of the Proposed Scheme and this impact is mirrored across the other A9 projects and therefore constitutes a significant adverse cumulative effect.

#### *Land-Take from Private Property*

- 20.3.30. Landowners with multiple landholdings impacted by A9 dualling projects include Clune and Corrybrough Estate which will be affected by land-take due to both the Proposed Scheme and Project 12 Tomatin to Moy. However, this is not considered to be a significant adverse cumulative effect given the extent of the proposed land-take.

#### *Long-Distance NMU routes*

- 20.3.31. There are not considered to be any adverse cumulative effects in relation to long-distance cycle route NCN7, in the vicinity of the A9, during operation. Indeed, the introduction of underpasses to provide safe crossing points combined with widening and resurfacing of sections of this route will result in a beneficial cumulative effect.

## 20.4. Conclusion

- 20.4.1. Significant Type 1 cumulative effects (adverse) of the Proposed Scheme are expected for Druim Mhor, Lynwilg Farm, Kinakyle, Birch View, March Cottage and Kinmundy during the construction phase. These effects comprise a combination of travel disruption and visual effects.
- 20.4.2. Significant Type 2 cumulative effects (adverse) of the Proposed Scheme in-combination with other developments include the loss of woodland on the Ancient Woodland Inventory (AWI) and carbon emissions, natural resources depletion and waste generation during construction.
- 20.4.3. There is potential for additional significant cumulative effects (adverse or beneficial), depending on the detailed designs for the other A9 dualling projects. This will be monitored at a strategic level by Transport Scotland.

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<sup>i</sup> The Highways Agency et al. (2008b). DMRB Volume 11, Section 2, Part 5 HA205/08: Assessment and Management of Environmental Effects, August 2008. Highways Agency, Scottish Government, Welsh Assembly Government and Department for Regional Development Northern Ireland.

<sup>ii</sup> Forestry Commission Scotland (2009). The Scottish Government's Policy on Control of Woodland Removal.

<sup>iii</sup> Forestry Commission Scotland (2015). Guidance to Forestry Commission Scotland staff on implementing the Scottish Government's Policy on Control of Woodland Removal.