

20 Cumulative Effects

20.1 Introduction

- 20.1.1 This chapter presents an assessment of the potential cumulative effects associated with the Proposed Scheme, as described in **Chapter 5**. The requirement for an assessment of cumulative effects is set out in EIA Directive (85/33/EEC) which, along with amendments, was codified by Directive 2011/92/EU, which was further amended in 2014 by Directive 2014/52/EU.
- 20.1.2 Whilst it is recognised that the A9 Dualling Programme as a whole (Perth to Inverness) could potentially give rise to cumulative effects related to traffic volume change, this chapter considers:
- The combined effect of a number of individual impacts arising as a result of the Proposed Scheme on a single sensitive receptor/ resource (Type 1 cumulative effects)
 - The combined effects of the Proposed Scheme with other reasonably foreseeable development schemes on a single sensitive receptor/ resource (Type 2 cumulative effects)

20.2 Approach and Methodology

Scope and Guidance

- 20.2.2 Design Manual for Roads and Bridges (DMRB) HA218/08 'Glossary of Terms Used in DMRB Volume 11, Sections 1 and 2' (Highways Agency et al., 2008) refers to the European Commission (EC) 'Guidelines for the Assessment of Indirect and Cumulative Impacts and Impact Interactions' (EC, 1999) for a common definition of cumulative impacts. It is this definition that has been applied in the methodology used for this EIA:

"Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project."

- 20.2.3 As far as this EIA is concerned, HA218/08 confirms that:

"a cumulative impact may arise as the result of:

a) the combined impact of a number of different environmental topic-specific impacts from a single environmental impact assessment project on a single receptor/ resource

b) the combined impact of a number of different projects within the vicinity (in combination with the environmental impact assessment project) on a single receptor/ resource".

Type 1 Cumulative Effects

- 20.2.4 An assessment was undertaken of the potential for cumulative effects on individual resources and receptors resulting from different residual impacts from the Proposed Scheme, based on the topic-specific assessments presented in **Chapters 8-18**.
- 20.2.5 In the absence of an established methodology for assessing interactions that lead to Type 1 effects, but with cognisance of the EC 'Guidelines for the Assessment of Indirect and Cumulative Impacts and Impact Interactions' (1999) and the descriptive checklist approach, a two-step process was followed as set out below.

Step 1: Review of Residual Impacts

- 20.2.6 The primary focus was upon significant residual impacts; however, the potential for a combination of minor (non-significant) residual impacts to result in a significant cumulative impact on an identified resource or receptor has also been considered.
- 20.2.7 The residual impacts are identified in the individual topic assessments, as set out in **Chapters 8-18**.
- 20.2.8 Where there was potential for interaction with other topic areas and subsequent identification of potential combined effects at sensitive receptors, cumulative effects were considered. Where the same sensitive receptor was identified, in relation to two or more individual topics, this receptor was considered further at Step 2.

Step 2: Consideration of Resultant Combined Effects

- 20.2.9 Consideration was then given to the potential for resultant combined effects both during the construction and/ or operation of the Proposed Scheme. This step focused on the potential sensitive receptors for combined effects identified in Step 1.
- 20.2.10 The relevant residual inter-topic effects were then grouped together, and the potential for significant combined effects upon the receptors was assessed. Supporting commentary is provided in the impact assessment in **section 20.4**. Professional judgement was employed to determine whether or not the effects are considered to be significant.

Type 2 Cumulative Effects

- 20.2.11 The potential for cumulative impacts from the Proposed Scheme in combination with other reasonably foreseeable projects and developments (Type 2 cumulative effects) has been carried out at two levels:
- Level 1: a high-level appraisal of potential inter-project (i.e. A9 Dualling Programme Projects) cumulative effects
 - Level 2: a high-level appraisal of potential cumulative effects with other reasonably foreseeable developments, within a defined study area encompassing 500m either side of the existing A9 (the selection of a 500m study area for the localised assessment was based on professional judgement, and was extended where necessary, on a case by case basis, to account for any notable developments just beyond the margins of the 500m study area)
- 20.2.12 A three-step process has been undertaken to identify potential cumulative effects:

Step 1: Identification of 'Reasonably Foreseeable' Developments

- 20.2.13 In accordance with the DMRB, 'reasonably foreseeable' is interpreted to include other projects that are 'committed' including:
- Trunk road and motorway projects which have been confirmed (i.e. going through the statutory processes). For the purpose of this assessment, this shall include consideration of projects that form part of the A9 Perth to Inverness Dualling Programme. Note however, that outwith material demand and waste issues, some A9 Projects can be scoped out due to topographic separation and distance (e.g. Project 3 is unlikely to result in direct cumulative impacts in combination with Project 7).
 - Development projects with valid planning permissions, 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. This was also expanded where applicable to include developments in the planning system which have yet to be determined.

- 20.2.14 A review of other major developments beyond those that are ‘committed’ has also been undertaken to ascertain whether any should justifiably also be included in the assessment, by virtue of their scale, location or timing.
- 20.2.15 Following consultation with the relevant local planning authority/ authorities, a full list of developments to be considered in the Type 2 Cumulative Effects Assessment was prepared, as set out in **Appendix 20.1** (contained in **Volume 2**).

Step 2: Consideration of Potentially Significant Cumulative Effects from ‘Reasonably Foreseeable’ Projects

- 20.2.16 Once the full list of developments had been identified and agreed, professional judgement was used to ‘scope out’ any of the developments that were not considered likely to have in combination significant cumulative effects; for example, based on location, type of development, or development status. This allowed the assessment to focus on those that may potentially result in significant cumulative effects in combination with the Proposed Scheme.

Step 3: Assessment of Type 2 Cumulative Effects

- 20.2.17 A systematic, topic by topic, consideration of potential Type 2 cumulative effects was then carried out. Professional judgement was employed to determine whether or not effects are considered to be significant.

Limitations to Assessment

- 20.2.18 In the absence of detailed construction phasing information for all of the A9 Dualling projects, the Type 2 cumulative effects assessment relied upon extrapolation of information provided in the published Transport Scotland ‘Project Level Programme for Design and Development Work’ (Transport Scotland, 2014).
- 20.2.19 Local Development Plan land allocations were not considered within the Type 2 cumulative effects assessment unless part of live or consented planning applications.
- 20.2.20 It has not been possible to undertake a detailed quantitative assessment of the cumulative effects of the Proposed Scheme on material demand, waste and embodied carbon, as quantified information is not available, at the time of writing, across all A9 Dualling projects.

20.3 Combined Impacts of the Scheme (Type 1)

- 20.3.1 The potential for combined impacts on one receptor/ resource has been assessed in relation to the topic-specific residual impacts identified in **Chapters 8-18**.

Step 1: Review of Residual Impacts

- 20.3.2 A small range of potential significant residual impacts have been predicted during construction and operation of the Proposed Scheme, even with the implementation of mitigation, as identified in **Chapters 8-18**. Other non-significant residual impacts have also been identified. All residual impacts with the potential for combined effects on individual receptors are set out in **Table 20-1** below:

Table 20-1: Likely Type 1 Cumulative Effects on Receptors by Topic

Topic	Residual Significant Impacts with Potential for Interaction with Other topics	Sensitive Receptors with Potential for Combined Effects
Construction Phase Impacts		
People and Communities – Community and Private Assets	Dalnaspidal community severance during construction is considered to be Slight Adverse . Construction stage access to residential dwellings and commercial properties at Dalnaspidal is considered to be Slight Adverse	Dalnaspidal – residents and business owners
	Construction phase closure of NCN7 and impacts on amenity to be experienced by NMUs is considered to be Substantial/ Moderate	Users of NCN7 (NMU 1)
	Diverted access and impacts on NMU amenity using General Wade's Military Road (NMU5) is considered to be Moderate Adverse during the construction phase	Users of General Wade's Military Road (NMU 5)
	Potential residual impact on Balsporran Cottages is considered to be Slight Adverse as a result of impacts on access, and on business viability, during construction	Balsporran Cottages
	Potential residual impact on Drumochter Lodge is considered to be Slight Adverse during construction as a result of impacts on access	Drumochter Lodge
Visual	Potential residual impact during construction on views from Dalnaspidal (using Station Cottages, viewpoint 3 as the representative viewpoint) is considered to be Substantial	Station Cottages Dalnaspidal – residents and business owners
	Potential residual impacts on views from NCN7 (NMU 1) at Station Cottages are considered to be Substantial during the construction phase	Users of NCN7 (NMU 1) at Station Cottages
	Potential residual impacts on views from NCN 7 (NMU 1) at Dalnaspidal are considered to be Substantial/ Moderate Adverse during the construction phase	Users of NCN7 (NMU 1) at Dalnaspidal
	Potential Substantial/ Moderate Adverse residual impacts on views from NCN 7 (NMU 1) at Drumochter Pass during the construction phase	Users of NCN7 (NMU 1) at Drumochter Pass
	Potential Substantial Adverse residual impacts on views from NCN 7 (NMU 1) north of Drumochter Lodge during the construction phase	Users of NCN7 (NMU 1) north of Drumochter Lodge
	Potential Moderate Adverse residual impacts on views from General Wade's Military Road (NMU 5) during the construction phase	Users of General Wade's Military Road (NMU 5)
	Potential residual impacts on views experienced by residents are considered to be Substantial Adverse during the construction phase	Balsporran Cottages
	Potential residual impacts on views experienced by residents are considered to be Substantial Adverse during the construction phase	Drumochter Lodge
Operational Impacts		
People and Communities – Community and Private Assets	At operation, residual socio-economic and impacts on community severance at Dalnaspidal are considered to be Slight Beneficial .	Dalnaspidal – residents and business owners
	Land-take from the property is considered to be Slight Adverse	Drumochter Lodge
	Access change to the property is considered to be Slight Adverse northbound and Slight Beneficial southbound. Overall change is Neutral .	Balsporran Cottages
	Impact on amenity of NMUs is considered to be Slight Adverse	Users of NCN7 (NMU1)
Visual	Impact on residents' views (using Station Cottages as representative viewpoint) is considered to be Moderate/ Slight (not significant)	Station Cottages Dalnaspidal – residents and business owners
	Impact on office workers and residents' views, and the impact on the view of outdoor users (gamekeepers), is considered to be Moderate Adverse	Drumochter Lodge
	Impact on residents' views, impact on views by hill walkers at this location is considered to be Moderate/ Slight (not significant)	Balsporran Cottages
	NMUs are considered to experience Moderate/Slight (not significant) visual impacts at viewpoint receptor 1 at Dalnaspidal and a Moderate impact at viewpoints 11 at Drumochter Pass and 18 north of Drumochter Lodge)	Users of NCN7
Noise	Impact on residential properties is considered to be Slight Adverse	Dalnaspidal – residents
	Impact on residential properties is considered to be Slight/ Moderate Benefit	Station Cottages
	Impact on property is considered to be Slight/ Moderate Adverse	Drumochter Lodge
	Impact on property is considered to be Slight Benefit	Balsporran Cottages

20.3.3 Two chapters, **Chapter 11** and **Chapter 14**, reported significant impacts on other receptors not listed above at the operational stage; these are beneficial in relation to flood risk and the water environment and adverse in relation to visual impacts. However, as these were not considered to have any potential for interaction with each other or with other topics, they have not been reported in **Table 20-1** above. No other chapters reported significant residual impacts at either the construction or operational stages.

Step 2: Consideration of Resultant Combined Effects

Construction

20.3.4 Of the potential residual impacts identified in **Table 20-1**, it can be seen that the construction phase has the potential to cumulatively affect five receptors, namely NCN7 (NMU 1), General Wade's Military Road (NMU 5), Dalnaspidal (residents and business owners), Balsporran Cottages and Drumochter Lodge.

20.3.5 However, the impacts relating to NCN7 (NMU1) and General Wade's Military Road (NMU5) are those reported in relation to Visual impacts and Effects on All Travellers. As the Effects on All Travellers assessment chapter includes consideration of visual amenity impacts on NMUs, and given that the assessment of amenity already combines consideration of noise, air quality, visual amenity and journey length impacts, it is not necessary to further combine the reported visual impacts as additional cumulative effects (as this would effectively be double counting).

20.3.6 In relation to Dalnaspidal, residents and business owners may experience **Slight Adverse** impacts relating to community severance and access to residential dwellings and commercial properties. The potential residual impact during construction on views from Dalnaspidal (using Station Cottages, viewpoint 3, as the representative viewpoint) is considered to be **Substantial**. The impact on access is not considered to be significant, as set out in **Chapter 8**; therefore, whilst the impact on views is substantial, overall there is not considered to be a significant cumulative effect.

20.3.7 In relation to Balsporran Cottages, owners/ visitors may experience a **Slight Adverse** impact in terms of access to the property, and a **Substantial** impact on views. As with Dalnaspidal, the impact on access is not considered to be significant, as set out in **Chapter 8**; therefore, whilst the impact on views is substantial, overall there is not considered to be a significant cumulative effect.

20.3.8 The owners of Balsporran Cottages could additionally experience an **Adverse** impact on business viability, which together with the impacts on views and access is considered to represent a **significant cumulative effect** on the business owners during the construction phase.

20.3.9 Drumochter Lodge will experience a **Slight Adverse** impact in terms of access to the property, and a **Substantial** impact on views. As with Dalnaspidal and Balsporran Cottages, the impact on access is not considered to be significant, as set out in **Chapter 8**; therefore, whilst the impact on views is substantial, overall there is not considered to be a significant cumulative effect.

Operation

20.3.10 During operation, as shown in **Table 20-1** there is the potential for cumulative effects on five receptors, namely Dalnaspidal (residents and business owners), Station Cottages, NCN7 (NMU 1), Balsporran Cottages and Drumochter Lodge.

20.3.11 However, for NCN7 (NMU1), the impacts are those reported in relation to Visual impacts and Effects on All Travellers. As the Effects on All Travellers assessment chapter includes consideration of visual amenity impacts on NMUs, and given that the assessment of amenity already combines consideration of noise, air quality, visual amenity and journey length impacts, it is not necessary to

further combine the reported visual impacts as additional cumulative effects (as this would effectively be double counting).

- 20.3.12 In relation to Dalnaspidal, impacts on views which residents and business owners may experience (using Station Cottages, viewpoint 3 as the representative viewpoint) are considered to be **Moderate/ Slight** (not significant). It is noted that at Station Cottages noise impacts during operation are predicted to be of **Slight/ Moderate** benefit; however, with the reported impacts on views and noise using other receptors in Dalnaspidal (**Slight Adverse** at Dalnaspidal Lodge and Staff Cottage) a potential cumulative effect on residents and business owners in Dalnaspidal cannot be discounted. However, as visual impacts are **Moderate/ Slight**, as set out in **Chapter 14**, and noise impacts are **Slight**; the combination of the two reported impacts is not significant.
- 20.3.13 It should also be noted that, as reported in **Chapter 8**, residents and business owners in Dalnaspidal will experience **Slight Beneficial** impacts relating to socio-economic impacts and community severance and, in the longer term (Do-min 2026 to Do something 2041), the noise impacts at Dalnaspidal would reduce to **Negligible Adverse**.
- 20.3.14 In relation to Balsporran Cottages, impacts relating to access to the property are predicted to be **Slight Adverse** travelling southbound, and **Slight Beneficial** travelling northbound, whilst impacts on views are anticipated to be **Moderate/ Slight** (not significant). As noise impacts are reported as **Slight Beneficial**, a significant cumulative effect is not predicted.
- 20.3.15 In terms of Drumochter Lodge, it is anticipated that users will experience **Moderate Adverse** impacts on views and a **Slight/ Moderate Adverse** impact from noise. It is also noted that in the longer term (Do-min 2026 to Do something 2041), the noise impacts at Drumochter Lodge would reduce to **Negligible Adverse**. Overall, no significant cumulative effect is predicted.

Summary of Type 1 Cumulative Effects

- 20.3.16 In summary, it was concluded that whilst three receptors have the potential to be subject to cumulative effects as a result of the construction and/ or operation of the Proposed Scheme, only construction-stage impacts on Balsporran Cottages, as a business, are considered to be significant.
- 20.3.17 There are not considered to be any significant residual cumulative effects on any of the receptors identified in **Table 20-1** once the Proposed Scheme is operational.
- 20.3.18 As mentioned in **paragraph 20.2.6** above, the potential for a combination of minor (non-significant) residual impacts to result in a significant cumulative impact on an individual resource or receptor has also been considered. This process was undertaken by reviewing minor residual impacts in the assessment process and reporting any which affect the same receptor in **Table 20-1** (e.g. **slight** and **moderate/ slight** (not significant) impacts). No significant cumulative effects were predicted.

20.4 Combined Impacts of the Proposed Scheme in Combination with Other Reasonably Foreseeable Projects (Type 2)

- 20.4.1 The impacts of the Proposed Scheme in combination with other reasonably foreseeable projects has been assessed in relation to individual receptors and resources identified in **Chapters 8-18**.

Step 1: Identification of 'Reasonably Foreseeable' Developments

- 20.4.2 In the first instance, all trunk road and motorway projects, planning permissions, planning applications under consideration and sites allocated in LDP documents within the study area were

identified following consultation with the Local Planning Authorities. The full list of projects can be found in **Appendix 20.1 (Volume 2)**.

Step 2: Consideration of Potentially Significant Cumulative Effects from ‘Reasonably Foreseeable’ Projects

- 20.4.3 Using professional judgement as set out in **sub-section 2.2**, a number of developments from the full list in **Appendix 20.1 (Volume 2)** were ‘scoped out’ from further assessment. Those developments not taken forward for the consideration of potentially significant cumulative impacts included planning applications that are not subject to EIA.
- 20.4.4 The resulting list of reasonably foreseeable projects where it was considered necessary to consider potentially significant cumulative effects is set out in **Table 20-2** below:

Table 20-2: List of Other Projects for Cumulative Impact Assessment

Ref No.	Development Name/ Location/ Application No.	Development Description	Development Status	Comments
Project 2	A9 dualling, Southern Section – Pass of Birnam to Tay Crossing	Trunk road and motorway projects being designed prior to statutory processes	Construction 2019	Scheme in preparation
Project 3	A9 dualling, Southern Section - Tay Crossing to Ballinluig	Trunk road and motorway projects being designed prior to statutory processes	Construction 2019	Scheme in preparation – preferred route announced – EIA in preparation
Project 4	A9 dualling, Southern Section - Pitlochry to Killiecrankie	Trunk road and motorway projects being designed prior to statutory processes	Construction 2019	Scheme in preparation – preferred route announced – EIA in preparation
Project 5	A9 dualling, Southern Section - Killiecrankie to Glen Garry (NB this is P5 and P6, which were combined into a single P5 area).	Trunk road and motorway projects being designed prior to statutory processes	Construction 2019	Scheme in preparation – preferred route announced – EIA in preparation
Project 8	A9 dualling, Central Section - Dalwhinnie to Crubenmore	Trunk road and motorway projects being designed prior to statutory processes	Construction 2019	Scheme in preparation – preferred route announced – EIA in preparation
Project 9	A9 dualling, Central Section - Crubenmore to Kincaig	Trunk road and motorway projects being designed prior to statutory processes	Construction 2019	Scheme in preparation – preferred route announced – EIA in preparation
Project 11	A9 dualling, Northern Section - Dalraddy to Slochd	Trunk road and motorway projects being designed prior to statutory processes	Construction 2019	Scheme in preparation – preferred route announced – EIA in preparation
Project 12	A9 dualling, Northern Section - Tomatin to Moy	Trunk road and motorway projects being designed prior to statutory processes	Construction 2019	Scheme in preparation – preferred route announced – EIA in preparation

Step 3: Assessment of Type 2 Cumulative Effects

- 20.4.5 Based on all of the developments listed in **Table 20-2** above, **Table 20-3** summarises the assessment of likely Type 2 cumulative effects and the significance of the combined effect by receptor, which have been identified in **Chapters 8-18**. Note that the operational impacts have been assessed in terms of the final residual impact presented in the topic chapters, e.g. for Landscape and Visual, years 15-25 are reported, rather than the short-term impact in years 0-15.

Table 20-3: Likely Significant Type 2 Cumulative Effects by Receptor

Topic	Potential Type 2 Cumulative Effects, Receptors and Significance	
	Construction	Operation
People and Communities – Community and Private Assets	<p>The highland estates impacted by the Proposed Scheme (Dalnaspidal, Dalnacardoch, North Drumochter and South Drumochter (and its secured agricultural tenancy)) also have land holdings within other A9 Dualling project extents and therefore may experience additional land-take and construction stage disruption/ disturbance to agricultural, forestry and sporting operations.</p> <p>Due to the differing stages of projects within the A9 Dualling programme, these impacts have not yet been fully assessed and defined within a published Environmental Statement (ES).</p> <p>However, it is considered that strategic level phasing between A9 construction projects will manage cumulative impact risks on these land interests during construction. It is therefore assessed that cumulative effects would not be significant and would not affect likely future viability.</p>	
People and Communities – Effects On All Travellers	<p>NMU Routes</p> <p>Whilst the majority of NMU routes identified are project specific, the NCN7 spans the majority of the A9, from Ballinluig to Inverness.</p> <p>Its proximity to the road varies; notably the NCN7 runs very close to the A9 between Pitagowan and Dalwhinnie (Projects 6 to 8) and further north between Tomatin and Moy (Project 12).</p> <p>It is anticipated that in some locations the construction period for A9 Dualling Projects would overlap, and if in proximity, these could have similarly adverse disruption of access impacts to those predicted for the Proposed Scheme in relation to NCN7.</p> <p>Although it is anticipated there will be adverse impacts on the NCN7 during construction, the cumulative impact is not considered significant given the mitigation in place to provide continuity of this route during the construction phase.</p>	<p>NMU Routes</p> <p>Upon operation, there will be no significant cumulative impacts on NMU routes in proximity to the A9.</p> <p>Underpasses will improve safe crossing opportunities, and where possible bus stops will be provided in proximity to communities.</p> <p>Similarly, upgraded lay-bys and parking facilities will be of benefit to NMU in terms of vehicle access to start/ end points linked to NCN7.</p> <p>It is therefore anticipated that overall there would be a beneficial cumulative impact in relation to NMU routes connected to the A9.</p>
	<p>Vehicle Travellers - Views from the Road</p> <p>During construction there are likely to be adverse effects on views from the road due to views of plant, bare earthworks, temporary signage/ structures/ SuDS, loss of roadside vegetation and areas for material storage, which could detract from the views of the surrounding high value scenery.</p> <p>It is anticipated that the construction period for A9 Dualling Projects will overlap in some places, however, it is considered that appropriate phasing of the dualling works would mean the cumulative effect is not significant.</p>	<p>Vehicle Travellers - Views from the Road</p> <p>Upon operation of the Proposed Scheme, it is considered that there will be negligible cumulative impact on views from the road, and therefore no significant cumulative effects arising from the Proposed Scheme with other Reasonably Foreseeable A9 Dualling Projects.</p>
	<p>Driver Stress</p> <p>It is anticipated that if Project 7 was to be constructed at the same time as other A9 Dualling Projects, there would be an adverse cumulative impact on driver stress during this time.</p> <p>This would be due to the likelihood of reduced speeds, lack of overtaking places and potential limited access to lay-bys during this time, all of which impact the main components of driver stress: traffic flows, speeds and frustration.</p> <p>However, it is considered that appropriate phasing of the dualling works would limit disruption and therefore it is not considered that there will be a significant cumulative impact.</p>	<p>Driver Stress</p> <p>In Project 7 there is considered to be a beneficial effect on driver stress, given the increase in overtaking opportunities and improved traffic flows upon operation of the Proposed Scheme.</p> <p>This effect will be similar across all A9 Dualling Projects, therefore there is considered to be a beneficial cumulative impact on driver stress.</p>

Topic	Potential Type 2 Cumulative Effects, Receptors and Significance	
	Construction	Operation
Geology, Soils and Groundwater	<p>It is considered unlikely that individual geology, soils or groundwater receptors within the Proposed Scheme extents will be affected by other reasonably foreseeable development or other projects in A9 Dualling Programme during construction; due to physical, topographical or hydrological separation and the inherent localised nature of impacts from individual construction activities which these are specific to.</p> <p>However, potential cumulative operational impacts identified as part of this assessment at a wider scale include the following:</p> <ul style="list-style-type: none"> • Incremental loss of soils of conservation interest, including carbon-rich soils and peat within the Cairngorms National Park; with associated functional or habitat fragmentation and loss • Incremental partial or greater disturbances to geodiversity features in the region • Incremental loss of groundwater dependent terrestrial ecosystems (GWDTE) <p>These potential impacts are particularly relevant to the Proposed Scheme when considered with Project 5 (Killiecrankie to Glen Garry) and Project 8 (Dalwhinnie to Crubenmore); which are known to have similar receptors present and may therefore have similar effects.</p> <p>However, as part of the design development process for each project these receptors have been avoided or minimised where practicable, and the specifics of any residual unavoidable constraints will have been assessed at project-level EIA, with appropriate mitigation identified where possible.</p> <p>Based on the above, assessment information available and using professional judgement, these potential cumulative effects are therefore expected to be minimal and are unlikely to be significant.</p>	
Road Drainage and the Water Environment	<p>It is considered that there will be beneficial cumulative effects relating to the water environment arising from the Proposed Scheme with other Reasonably Foreseeable A9 Dualling Projects.</p> <p>The provision of SuDS will provide significant beneficial effects to the water environment both in terms of water quality (through treatment) as well as flood risk (through storage), comparative to existing conditions.</p> <p>All new Proposed A9 Schemes projects are also designed to remain operational in a 1:200 flood event, so significant cumulative benefits across Perth to Inverness will be provided in a number of areas, e.g. business, emergency services.</p> <p>Significant beneficial cumulative effects on the hydromorphology of the water environment across Schemes is facilitated by numerous improvements, e.g. the design of crossings that allows the natural evolution of river morphology and encourages sediment transfer, which will propagate downstream through the Tay and Spey catchments.</p>	
Ecology and Nature Conservation	<p>Ecological permeability through the Proposed Scheme will be improved with the provision of mammal ledges within watercourse crossings to offer regular and safe crossing opportunities for protected species. In addition, natural bed material will be installed in watercourse crossings to promote natural river morphology processes and habitat for aquatic species.</p> <p>Each crossing improvement would result in a low beneficial residual effect for relevant species, but this is not considered significant in its own right. Improved permeability delivered across all A9 schemes could however provide a significant cumulative beneficial effect for mammals (e.g. otter/ badger/ wildcat/ deer) and freshwater fish (e.g. salmonids).</p> <p>Provision of SuDS within the road drainage network for the Proposed Scheme will ensure surface water run-off from the operational carriageway will be intercepted, and treated. This will reduce the potential risk of contaminants entering and damaging the water environment within the River Spey and River Tay catchments. This would result in a low beneficial effect for relevant species, but is not considered significant in its own right. However, provision of SuDS across all A9 schemes could provide a significant cumulative beneficial effect for wetland ecosystems and associated species.</p> <p>The Proposed Scheme will result in the permanent loss of, and temporary disturbance to, notable habitats including but not limited to dry heath, wet heath and blanket bog. Given the proximity of protected sites and scale of potential habitat loss, the Proposed Scheme could result in medium adverse residual effects for dry heath, wet heath and blanket bogs; although, the accompanying Outline Habitat Management Plan (see Appendix 12.11(Volume 3)) details measures to reinstate temporarily disturbed habitats. All other A9 schemes will not result in a significant cumulative effect due to the topography, distance and limited hydrogeological connectivity to the affected habitats.</p>	

Topic	Potential Type 2 Cumulative Effects, Receptors and Significance	
	Construction	Operation
Landscape	<p>Construction of Projects 7 and 8 will have a significant cumulative effect on Drumochter Pass LCA and the Glen Truim: Upper Glen and Dalwhinnie LCA as these span between the two projects.</p> <p>There will be significant cumulative effects at Construction on Dail A' Chuirn LLCA, on Pass of Drumochter LLCA due to the Drumochter Lodge/ Balsporran underbridge access, which will result in tree loss and conspicuous earthworks.</p> <p>As this LLCA straddles the tie-in with Project 8, there is potential for significant cumulative effects.</p> <p>The Proposed Scheme will have indirect significant cumulative effects on Tom a'Bhacain LLCA in Project 8.</p> <p>Likewise, there will be cumulative significant effects on landscape features, including landform, vegetation, woodland, wildness, water and historic and cultural associations, as well as on the landscape experience from the A9.</p> <p>There will likely be indirect but not significant cumulative effects on Dalnaspidal Forest LLCA, Southern Hill Slopes LLCA and Upper Glen Garry LLCA that are contiguous with Tom a'Bhacain LLCA.</p>	<p>Upon operation, significant cumulative effects from the Proposed Scheme in combination with Project 8 will still be present, but these will reduce over time as a result of required mitigation at the individual project level.</p> <p>The effects will continue to reduce, as tree planting will grow high enough to screen views of the new works from sensitive locations and receptors, and scrub, shrub and heath and other vegetation will have become established, becoming more in keeping with the respective LLCA characteristics, and will not be significant by Operation years 15-25.</p>
Visual	<p>It is anticipated that the construction period for several A9 Dualling Projects would overlap in places, therefore there would be adverse cumulative effects on views from the road during the construction stage.</p> <p>Likewise, there could be adverse cumulative effects on views from the Highland Main Line (HML) railway during the construction stage.</p> <p>Given their proximity, there will be intervisibility between Projects 7 and 8 from certain viewpoints (e.g. local Munro hillsides). If construction periods overlap, this could result in significant cumulative visual effects.</p>	<p>There will be significant effects on the intervisibility and views from within Project 8 upon completion of the Proposed Scheme from: the Hill track to A' Bhuidheanach; and the summit of Leacainn to the east of Dalwhinnie.</p> <p>These will have reduced to not significant by years 15-25 due to the settling-in of the embedded mitigation, weathering of materials and stonework, and additional mitigation. This includes growth of vegetation and woodland throughout the scheme.</p> <p>The combined effect will be that the road will largely look as it does now, with no significant residual cumulative effects from these locations.</p> <p>Long term cumulative effects on intervisibility between the Proposed Scheme and Project 8 from the hillslopes of Creagan Doire Dhonaich; the track along Allt Beul an Spoinn; the hillslopes of Creagan Mor and the NCN7 North of Drumochter Lodge, will likewise remain not significant.</p>
Cultural Heritage	<p>It is considered that there will be no significant cumulative effects arising from the Proposed Scheme with other Reasonably Foreseeable A9 Dualling Projects in relation to Cultural Heritage.</p> <p>It should be noted that the cumulative effect on General Wade's Military Road as a whole has been considered. Although there will be minor removals and alterations, the historic routeway will still be understood as a separate routeway and as the historic routeway.</p>	
Air Quality	<p>It is considered that there will be no significant cumulative effects arising from the Proposed Scheme with other Reasonably Foreseeable A9 Dualling Projects in relation to air quality.</p>	
Noise and Vibration	<p>The construction programme for A9 Dualling Projects may result in overlaps between the construction of adjacent Projects 5 and 8 at the same time as the construction of Project 7.</p> <p>However, given the distances between receptors within the Project 7 study area to the construction areas for Projects 5 and 8, which are well in excess of 500m, there would not be expected to be any significant cumulative impacts from any concurrent construction activities.</p>	<p>The assessment of operational road traffic noise for Project 7 as presented in Chapter 17 is considered to be cumulative as the traffic data provided for assessment assumes that all A9 Dualling Projects will open to traffic at the time of Project 7 opening.</p> <p>As such, no further cumulative assessment of road traffic noise is considered necessary.</p>

Topic	Potential Type 2 Cumulative Effects, Receptors and Significance	
	Construction	Operation
Materials	<p>Constructing the Proposed Scheme is likely to generate both concurrent and sequential cumulative environmental effects with regards to the generation of embodied carbon emissions, the depletion of natural resources and the generation of waste as a result of constructing Project 7 before, at the same time, or after, the other reasonably foreseeable A9 Dualling projects being progressed under the Luncarty to Glen Garry (Southern), Glen Garry to Dalraddy (Central) and Dalraddy to Moy (Northern) Scheme.</p> <p>When assessed in isolation, the environmental effects of constructing the Proposed Scheme have been determined to be non-significant from an EIA perspective.</p> <p>Based on professional judgement, the resultant combined cumulative effects of the Proposed Scheme with the other reasonably foreseeable A9 Dualling projects are considered to be locally or regionally significant within the study area, but unlikely to become issues at wider scales.</p> <p>Cumulative operational phase impacts have been scoped out of the Materials assessments.</p>	

- 20.4.6 Of the potential Type 2 cumulative effects identified in **Table 20-3**, a number of potential significant adverse cumulative effects have been identified during construction and operation. Mitigation, where required, for these adverse impacts is discussed in the section below.
- 20.4.7 Once the Proposed Scheme is completed, as identified in **Table 20-3** there would be a significant beneficial cumulative impact in relation to users of NCN7. There are also predicted beneficial effects in relation to the water environment, notably in relation to the provision of SuDS for discharge water quality and flood risk betterment compared to existing conditions; continued emergency access during flood events; and hydromorphology benefits, facilitated by the design of crossings that allow the natural evolution of river morphology and encourage sediment transfer which will propagate downstream through the Spey catchment.
- 20.4.8 It should also be noted that in some instances significant cumulative effects have not been identified; this is largely due to the fact that the Proposed Scheme is separated from other reasonably foreseeable projects physically or geographically by topography, or because already dualled sections provide physical separation between projects.

20.5 Mitigation and Residual Impacts

- 20.5.1 Of the residual effects identified in **Table 20-2**, there is the potential for significant adverse Type 1 cumulative effects, i.e. cumulative effects on individual receptors, in relation to the business viability of Balsporran Cottages. Mitigation measures will be employed to reduce the impacts on business viability where possible (SMC-S3, SMC-CP1, SMC-CP2, SMC-CP3 and P07-CP5), although these will not reduce the impacts to neutral, as discussed in **Chapter 8**.
- 20.5.2 Of the potential Type 2 cumulative effects identified in **Table 20-3**, a number of adverse construction phase cumulative effects have been identified. These principally relate to landscape and visual impacts where the combined effects of Project 7 and Project 8 are predicted to be significant; and impacts on users of NCN7 and vehicle travellers, who might experience construction impacts from a number of A9 dualling projects in combination as they travel through the A9 Dualling Programme extents. As these effects are temporary and limited to the construction phase, however, no additional mitigation is considered necessary.
- 20.5.3 On completion of the Proposed Scheme, the landscape impacts on some LLCAs will remain significant at operation year 1, as set out in **Chapter 13**, potentially in combination with impacts arising from Project 8. However, as noted in **Table 20-3**, the effects will reduce with time as planted mitigation measures establish and soften the works in both schemes into the surrounding landscape.

- 20.5.4 As explained in **Table 20-3** above, it is considered that in terms of the generation of embodied carbon emissions, the depletion of natural resources and the generation of waste, there is the potential for cumulative effects. However, it is also considered that the route-wide construction programme is likely to present opportunities for more effective materials management, either allowing re-use of surplus materials between the Glen Garry to Dalraddy projects, and/ or within the overall A9 Dualling Programme (subject to waste regulatory controls).

20.6 References

European Commission '*Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*' (May 1999)

Highways Agency *et al.* '*Glossary of terms used in DMRB Volume 11, Sections 1 and 2*' (2008)

Transport Scotland '*Project Level Programme for Design and Development Work*' (2014)