

## **22 Summary of Significant Residual Impacts**

### **22.1 Introduction**

- 22.1.1 This chapter summarises the significant residual impacts (Tables 22.1 to 22.11) that have been identified due to construction and operation of the proposed scheme. These residual impacts comprise those which remain significant after incorporating the mitigation measures as provided in Chapters 8 to 18 and 20 (where applicable) and as set out in Chapter 21 (Schedule of Environmental Commitments).
- 22.1.2 Within this ES, significant impacts are identified according to the methodology provided for each environmental topic within Chapters 8-18 and Chapter 20. Impacts are generally defined as significant in the context of the EIA Regulations where they are assessed as Moderate or of greater significance. Residual impacts that have been assessed as not significant are also provided within Chapters 8-18 and Chapter 20, but are not considered within this chapter.
- 22.1.3 Environmental parameters which do not have any significant residual impacts comprise those relating to air quality (Chapter 16: Air Quality) and noise and vibration (Chapter 17: Noise and Vibration).
- 22.1.4 According to the DMRB, guidance impacts on driver stress are assessed using a three-point scale and embodied carbon associated with material resources is assessed using magnitude rather than assigning significance. Driver stress and material resources are assessed in Chapter 9 (People and Communities – All Travellers) and Chapter 18 (Materials) respectively.
- 22.1.5 All residual impacts in Table 22.1 to 22.11 are adverse unless stated otherwise.

**Table 22.1 Summary of significant residual impacts – People and Communities: Community and Private Assets (Chapter 8)**

Residual Impact	Residual Impact Significance
<b>Residential Land and Property</b>	
<p><u>Woodlands and Ledpetty Lodge</u>                      Direct access to existing A9 replaced with left-in left-out access resulting in additional significant journey distance when travelling north from the property (3.4km) and travelling south (3.3km).</p>	<p><b>Moderate</b> impacts for journeys travelling north and south from the property.</p>
<p><u>Warren Lodge</u>                      Direct access to existing A9 replaced with left-in left-out access resulting in additional significant journey distance when travelling north from the property (3.4km) and travelling south (2.8km).</p>	<p><b>Moderate</b> impacts for journeys travelling north and south from the property.</p>
<p><u>St Colmes</u>                      Direct access to existing A9 replaced with left-in left-out access resulting in additional significant journey distance when travelling north from the property (5.1km)</p>	<p><b>Substantial</b> impacts for journeys travelling north from the property.</p>
<p><u>Rotmell Cottages (4 residential properties)</u>                      Direct access to existing A9 replaced with left-in left-out access resulting in additional significant journey distance when travelling north from the property (5.1km).</p>	<p><b>Substantial</b> impacts for journeys travelling north from the property.</p>
<p><u>Properties at Dowally</u>                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling south from the property (3.6km).                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling from the south to the properties (1.7km).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.  <b>Moderate</b> impacts for journeys travelling from the south to the properties.</p>
<p><u>1 Dowally Cottage</u>                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling south from the property (3.6km).                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling from the south to the properties (1.7km).                      Partial loss of garden from side road (0.01ha).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.  <b>Moderate</b> impacts for journeys travelling from the south to the property.  <b>Moderate</b> impacts as a result of land-take.</p>
<p><u>Dowally Cottage</u>                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling south from the property (3.5km).                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling from the south to the property (1.4km).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.  <b>Moderate</b> impacts for journeys travelling from the south to the property.</p>
<p><u>Balnabeggan</u>                      Direct access to existing A9 replaced with left-in left-out access resulting in additional significant journey distance when travelling south (2.4km) from the property.</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.</p>
<p><u>Properties at Guay (14 residential properties)</u>                      Direct access stopped up and an alternative left in left access provided resulting in additional significant journey distance when travelling south from the property (1.7km).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.</p>

Residual Impact	Residual Impact Significance
<p><u>Guay Farmhouse</u>  Direct access stopped up and an alternative left in left access provided resulting in additional significant journey distance when travelling south from the property (1.7km).  Partial demolition and partial loss of parking area and garden from main alignment and access track (0.38ha).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.  <b>Substantial</b> impacts as a result of land-take</p>
<p><u>Ballintium</u>  Direct access stopped up and an alternative left in left access provided resulting in additional significant journey distance when travelling south from the property (1.7km).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.</p>
<p><u>Properties at Kindallachan (20 residential properties)</u>  Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling north from the property (2.9km).</p>	<p><b>Moderate</b> impacts for journeys travelling north from the property.</p>
<p><u>Southern Kindallachan Cottages (6 residential properties)</u>  Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling north from the property (2.8km)</p>	<p><b>Moderate</b> impacts for journeys travelling north from the property.</p>
<p><u>Corft Croy Properties (No. 1 and No. 2)</u>  Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling north from the property (2.8km)  Partial loss of garden from side road (0.22ha).</p>	<p><b>Moderate</b> impacts for journeys travelling north from the property.  <b>Moderate</b> impacts as a result of land-take</p>
<p><u>Croftnascallaig</u>  Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling north from the property (2.9km).</p>	<p><b>Moderate</b> impacts for journeys travelling north from the property.</p>
<p><u>Haugh of Kilmorich</u>  Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling south from the property (4.8km).  Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling from the north to the property (5.3km).  Partial loss of garden from main alignment and side road (0.02ha).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.  <b>Substantial</b> impacts for journeys travelling from the north to the property.</p>
<p><u>Haugh Cottage South and North (2 residential properties)</u>  Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling south from the property (3.9km).  Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling from the north to the property (6.1km).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.  <b>Substantial</b> impacts for journeys travelling from the north to the property.</p>
<p><u>Westhaugh of Tullimet</u>  Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling south from the property (3.6km).  Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling from the north to the property (6.4km).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.  <b>Substantial</b> impacts for journeys travelling from the north to the property.</p>

Residual Impact	Residual Impact Significance
<b>Commercial/Industrial Property</b>	
<p><u>Dowally Chalet and Caravan Park</u>                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling south from the property (3.5km).                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling from the south to the property (1.4km).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.  <b>Moderate</b> impacts for journeys travelling from the south to the property.</p>
<p><u>R A Laird Contractors Ltd</u>                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling south from the property (3.5km).                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling from the south to the property (1.4km).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.  <b>Moderate</b> impacts for journeys travelling from the south to the property.</p>
<p><u>Dowally Craft Centre</u>                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling south from the property (2.4km).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.</p>
<p><u>Tayview Lodges</u>                      Direct access stopped up and an alternative left in left access provided resulting in additional significant journey distance when travelling south from the property (1.7km).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.</p>
<p><u>Alex Butter Landscaping</u>                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling north from the property (2.9km).</p>	<p><b>Moderate</b> impacts for journeys travelling north from the property.</p>
<p><u>Cuil-an-Duin Country House</u>                      Partial loss of woodland from main alignment (1.49ha). Change in alignment of side road to access the property.</p>	<p><b>Moderate</b></p>
<p><u>House of Bruar Mail Order Warehouse</u>                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling south from the property (3.6km).                      Direct access stopped up and an alternative left-in left-out access provided resulting in additional significant journey distance when travelling from the north to the property (6.4km).</p>	<p><b>Moderate</b> impacts for journeys travelling south from the property.  <b>Substantial</b> impacts for journeys travelling from the north to the property.</p>
<b>Community Land and Community Facilities</b>	
<p>During construction, Dowally Church Car Park is subject to loss of 60% of the total car park area.</p>	<p><b>Moderate</b></p>
<p>Increased journey distance for pedestrians (vulnerable groups and non-vulnerable groups) travelling from Kindallachan to relocated northbound and southbound bus stops.</p>	<p><b>Substantial</b></p>
<p>Decreased journey distance for pedestrians (vulnerable and non-vulnerable groups) travelling from Dowally to the northbound and southbound bus stops and from Guay to the southbound bus stop.</p>	<p><b>Substantial (beneficial)</b></p>
<b>Agricultural, Forestry and Sporting Interests</b>	
<p><u>Dowally, Guay and Haugh of Tullimet Farms: Robert Laird</u>                      The farm business would have permanent land-take of 9% of the total farmed area (7% LCA Class 3.2, 1% woodland and 1% other land).</p>	<p><b>Substantial</b></p>

Residual Impact	Residual Impact Significance
Demolition of Guay Cattle Shed. Change in access to Dowally Farm, loss of access to Guay Farm Dutch barn, change in access to Fishing Hut and change of access to Westhaugh of Tulliemet. Significant increased journey distance when travelling from the south to Dowally Farm (1.4km). Significant increased journey distance when travelling south from Dowally Farm (3.4km). Significant increased journey distance when travelling from the north to Westhaugh of Tulliemet (6.4km). Significant increased journey distance when travelling south from Westhaugh of Tulliemet (3.6km).	
<b>Dalmarnock Fishing Beat</b> Direct access to existing A9 replaced with left-in left-out access at ch1020 and ch2760 resulting in additional significant journey distance when travelling from Fishing Bothy 2 to Fishing Bothy 1 (7.3km).	<b>Substantial</b>

**Table 22.2: Summary of significant residual impacts - People and Communities: All Travellers (NMUs) (Chapter 9)**

Residual Impact	Residual Impact Significance
<b>Construction</b>	
Impacts on amenity value and potential diversion length would be present for NMUs using Path 53, Path 55 and the section of Path 58 between Dowally Farm and the existing A9 (approx. ch4150 to ch4200) due to temporary closure of access to these paths.	<b>Moderate to Substantial</b>
Impacts on amenity value and potential diversion length would be present for NMUs using CP01 (Path 60), CP03 (Path 66), Path 53 and Path 67a.	<b>Moderate to Substantial</b>
Impacts for NMUs using RCR 83 (including RCR 83 (South of Rotmell), Path 56/RCR 83, Path 63/RCR 83, Path 65/RCR 83 and RCR 83 (North of Westhaugh of Tulliemet)) due to temporary closure or disruption to the route.	<b>Moderate to Substantial</b>
Impacts on amenity value and potential diversion length would be present for NMUs using Path 53, Path 55, Path 60 (CP01) and Path 66 (CP03) for accessing the River Tay.	<b>Moderate to Substantial</b>
Impacts on NMUs accessing the two existing bus stops at Kindallachan during construction due to disruption to access and additional distances NMUs may have to travel to access public transport.	<b>Moderate to Substantial</b>
<b>Operation</b>	
Increase in journey length and decrease in amenity value for NMUs using Path 60 (CP01) and severance of the path and decreased amenity value for NMUs using Path 66 (CP03).	<b>Moderate</b>

**Table 22.3: Summary of significant residual impacts – People and Communities: All Travellers (View from the Road) (Chapter 9)**

Residual Impact	Residual Impact Significance
	Winter Year of Opening
<b>Operation</b>	
Residual impacts on the view from the road at Winter Year of Opening, within the Strath Tay: Mid Glen LLCA (ch600 to end of proposed scheme (ch8200)).	<b>Moderate</b>

**Table 22.4: Summary of significant residual impacts – Geology, Soils, Contaminated Land and Groundwater (Chapter 10)**

Residual Impact	Residual Impact Significance
<b>Construction/Operation</b>	
Localised residual impacts on groundwater flow within glacial till and glaciofluvial deposits/alluvium/river terrace deposits.	<b>Moderate to Moderate/Large</b>

**Table 22.5: Summary of significant residual impacts – Road Drainage and Water Environment (Chapter 11)**

Residual Impact	Residual Impact Significance
<b>Operation</b>	
Adverse residual impacts on hydrology and flood risk impacts attributed to WF06 (River Tay) due to increase in fluvial depth from the 0.5% AEP (200-year) plus climate change event at two locations: field at ch6400 and area of land on west bank of the River Tay at approximately ch3000.	<b>Moderate</b>

**Table 22.6: Summary of significant residual impacts – Ecology and Nature Conservation (Chapter 12)**

Residual Impact	Residual Impact Significance
<b>Operation</b>	
Loss of 10.16ha of habitat designated as AWI of which 6.35ha is currently wooded. Measures such as compensation planting of native species in candidate sites will be implemented to reduce the extent of the impact. This planting will not fully mitigate for the permanent loss of intrinsic biodiversity value as a result of the proposed scheme, and a significant adverse residual impact is predicted, but at a reduced extent to that prior to compensation.	<b>Significant</b>

**Table 22.7: Summary of significant residual impacts – Landscape (Chapter 13)**

Residual Impact	Residual Impact Significance	
	Winter Year of Opening	Summer (+ 15 years)
<b>Construction/Operation</b>		
<p><u>Strath Tay: Mid Glen LLCA</u>                      Impact would be incurred as a result of a medium magnitude of change associated with the loss of defining features of the LLCA including:</p> <ul style="list-style-type: none"> <li>• Loss of areas of pasture and arable land at various locations along the length of the proposed scheme.</li> <li>• Modifications to the existing landform including visually prominent cuttings near Woodlands (ch650 to ch1050), at and north of Warren Lodge (ch1700 and ch1900 to ch2150), Rotmell (ch3100 to ch3300), south of Guay (ch4700 to ch4950) and a prominent steep hard-faced soil nailed slope at Haugh of Kilmorich (ch7300 to ch7700).</li> <li>• The felling of roadside trees.</li> <li>• The staged construction of a contiguous bored pile wall and rock revetment to control river erosion which will result in the loss of woodland between the</li> </ul>	<b>Moderate/Substantial</b>	<b>Moderate</b>

Residual Impact	Residual Impact Significance	
	Winter Year of Opening	Summer (+ 15 years)
<p>route and the river Tay (ch1600 to ch1900).</p> <ul style="list-style-type: none"> <li>The loss of areas of mature woodland, including AWI woodland, particularly at Rotmell (ch2900 to ch3300) and to the north of Dowally (ch4600 to ch5000), and a loss of scrub and woodland to the east of Haugh of Kilmorich (ch7000 to ch7300).</li> <li>The opening up of views towards the proposed scheme, particularly at Rotmell and Woodlands where long distance views to new cuttings will be obtained across the valley floor.</li> <li>The introduction of prominent new vertical elements of road infrastructure within the rural landscape with local and long distance views obtained to the new Guay South Overbridge (ch4700).</li> <li>The introduction of five SuDS ponds/basins and an Ecological/Compensatory Flood Storage Pond within the landscape.</li> <li>The introduction of lighting columns associated with the A9 Southern Tie-in Interim Roundabout at ch650 which would be visible in local views as vertical elements within the rural landscape.</li> <li>The introduction of night-time lighting associated with the A9 Southern Tie-in Interim Roundabout at ch650 into a relatively dark landscape.</li> </ul>		

**Table 22.8: Summary of significant residual impacts – Visual (Chapter 14)**

Residual Impact	Residual Impact Significance
<b>Construction</b>	
Approximately 27 (35%) built receptors and 18 (57%) outdoor receptors are predicted to be significantly affected by visual impacts of the proposed scheme during construction. However, these impacts will be temporary and may not be significant for the full duration of their occurrence.	<b>Moderate to Substantial</b>
<b>Operation</b>	
In the Winter Year of Opening of the proposed scheme, 27 (35%) built receptors and 17 (54%) outdoor receptors are predicted to be significantly affected by visual impacts of the proposed scheme. By the summer, 15 years after the proposed scheme opening, mitigation mostly in the form of new woodland, scrub and individual tree planting as well as grass and heath establishment will reduce the total number of significant adverse impacts on built receptors to 12 (18%) and ten (31%) outdoor receptors.	<b>Moderate to Substantial</b>

**Table 22.9: Summary of significant residual impacts – Cultural Heritage (Chapter 15)**

Residual Impact	Residual Impact Significance
Residual impact on cultural heritage resource comprising archaeological remains (Asset 221: Kindallachan, cairn).	<b>Large</b>
Residual impact on cultural heritage resource comprising archaeological remains (Asset 225: Kindallachan, standing stone)	<b>Moderate</b>
Residual impact on cultural heritage resource comprising historic buildings (Asset 216: Guay Farmhouse).	<b>Moderate</b>

**Table 22.10: Summary of significant residual impacts – Materials (Chapter 18)**

Residual Impact	Residual Impact Significance
<b>Construction</b>	
Transport Scotland's Carbon Management System estimated total embodied carbon emissions for the proposed scheme to be between 21,800 and 25,000 tonnes of CO <sub>2</sub> e including a 15% contingency, which has an impact of moderate magnitude (significance has not been assigned to the impacts of carbon emissions for this assessment).	<b>Moderate (magnitude only)</b>

**Table 22.11: Summary of significant residual impacts – Cumulative Impacts (Chapter 20)**

<p>Type 1 significant cumulative impacts due to the combined effect of a number of different environmental impacts of the proposed scheme on a single receptor/resource are expected on 9 receptors as a result of the proposed scheme:</p> <ul style="list-style-type: none"> <li>• Warren Lodge due to a combination of significant changes in vehicle access and significant visual impacts which are only partly mitigated by woodland planting after 15 years.</li> <li>• Ledpetty Lodge due to a combination of significant changes in vehicle access and the remaining non-significant impacts arising from visual impacts and noise.</li> <li>• Dowally Cottages due to combination of significant changes in vehicle access and significant visual impacts which are only partly mitigated by woodland planting after 15 years.</li> <li>• Dowally Farm (including Robert Laird and RA Laird Contractors Ltd) due to the combination of significant permanent impacts in terms of land-take, changes in vehicle access and visual impacts.</li> <li>• Guay Farmhouse due to combination of changes in vehicle access, land-take and significant visual impacts which are not reduced in significance by mitigation after 15 years. 1 and 2 Croft Croy due to the combination of permanent significant impacts in terms of changes in vehicle access, land-take and visual impacts</li> <li>• Haugh of Kilmorich due to combination of significant changes in vehicle access and significant visual impacts which are not reduced in significance with mitigation after 15 years.</li> <li>• Haugh Cottage South and Haugh Cottage North; due to combination of significant changes in vehicle access and significant visual impacts which do not reduce in significance with mitigation after 15 years.</li> <li>• Westhaugh of Tulliemet: due to combination of significant changes in vehicle access and significant visual impacts which do not reduce in significance with mitigation after 15 years.</li> </ul>	<b>Significant Adverse</b>
<p><u>Cumulative impacts of the proposed scheme in combination with other developments (Type 2 impacts)</u>            Cumulative loss of AWI, as although compensation planting is proposed, this will not mitigate for the permanent loss of existing biodiversity and the age of trees lost.</p>	<b>Significant Adverse</b>