22. Summary of Significant Residual Effects

22.1. Introduction

22.1.1. This Chapter summarises both the significant adverse and beneficial residual effects that have been identified in the assessment chapters (Chapters 7 to 20) of this Environmental Impact Assessment (EIA) Report. The tables below include the effects identified during both construction and operation which remain significant after incorporation of the mitigation measures (where applicable) as provided within the assessment chapters. These mitigation measures are set out in Chapter 21: Schedule of Environmental Commitments.

22.1.2. The significant residual effects identified in this Chapter were assessed in line with the methodologies outlined in each assessment chapter. Significant residual effects typically comprise those that are within the moderate, large or very large categories. Residual effects that have not been assessed as significant are provided within each assessment chapter but have not been reproduced here.

22.1.3. It should be noted that there were no significant residual effects identified for the following assessments:

- Air Quality
- Cultural Heritage
- Geology, Soils and Groundwater
- Material Assets and Waste
- Effects on Climate
- Climate Vulnerability and
- Major Accidents and Disasters.

22.2. Summary of Significant Residual Effects

Table 22.1 - Chapter 9 Significant Residual Effects (Landscape) – Construction

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Loch Lomond and The Trossachs National Park (LLTNP)	Construction activity includes the felling of trees, formation of rock cuts and earthworks and additional new man-made features including the Debris Flow Shelter (DFS), retaining walls, ancillary buildings, the Sustainable Drainage Systems (SuDS) and access track, extension of HESCO barrier, bund formation and works to the Rest and Be Thankful car park. The magnitude of impact is minor adverse.	Moderate adverse
Upland Glen Landscape Character Type (LCT) No.252 (LLTNP)	Most of the Proposed Scheme lies within this LCT. Construction of the DFS, catch pit, retaining walls, update to the junction with the B828, SuDS, RBT car park, and new active travel link would be notable changes as would the HESCO barrier extension and new bund on the OMR. There would be notable verge widening to the inside bend opposite the B828. The magnitude of impact to the LCT would be major adverse during construction due to construction activity and the new structural elements and the felling, rock cuts and earthworks to facilitate these.	Very large adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Highland Summits LCT No. 251 (LLTNP)	During construction the character would be altered by the construction activity but the sense of place would not be diminished for this LCT due to the geographical extent. Construction activity would be largely limited to Glen Croe though partially visible from a limited area of the LCT for a limited period. Some habitat improvements to the area of hillside near Honeymoon Bridge, including broadleaf planting, will be undertaken. The magnitude of impact is minor.	Moderate adverse
SLQ: Tranquillity	During construction works on the A83, the OMR and the Rest and Be Thankful car park resulting from the construction work would adversely affect *tranquillity SLQ*. The changes would include addition of the DFS, retaining walls and associated DFS lighting, localised widening to the OMR and the introduction of additional man-made elements (HESCO barrier extension, bund to the south of the existing HESCO barrier and upgrades to culverts). The magnitude of impact is major.	Very Large Adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
SLQ: Famous through routes	During construction works on the A83, the OMR and the Rest and Be Thankful car park resulting from the construction work would adversely affect the *SLQ*. The changes would include addition of the DFS, retaining walls and associated DFS lighting, localised widening to the OMR and the introduction of additional man-made elements (HESCO barrier extension, bund to the south of the existing HESCO barrier and upgrades to culverts). The magnitude of impact is major.	Very Large Adverse
SLQ: Dramatic pass Rest and Be Thankful	During construction works on the A83, the OMR and the Rest and Be Thankful car park resulting from the construction work would adversely affect the *SLQ*. The changes would include addition of the DFS, retaining walls and associated DFS lighting, localised widening to the OMR and the introduction of additional man-made elements (HESCO barrier extension, bund to the south of the existing HESCO barrier and upgrades to culverts). The magnitude of impact is major.	Very Large Adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
SLQs *World-renowned landscape;* *Wild and rugged highlands containing pastoral lowland;* *Easily accessible landscape splendour;* *A land of forests and trees;* *Arrochar's mountains and distinctive peaks; and* *A variety of glens.*	During construction works on the A83, the OMR and the Rest and Be Thankful car park resulting from the construction work would adversely affect these SLQs. The changes would include addition of the DFS, retaining walls and associated DFS lighting, localised widening to the OMR and the introduction of additional man-made elements (HESCO barrier extension, bund to the south of the existing HESCO barrier and upgrades to culverts). The magnitude of impact is major.	Moderate Adverse

Table 22.2 - Chapter 9 Significant Residual Effects (Landscape) – Operation

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Upland Glen LCT No.252 (LLTNP)	Most of the Proposed Scheme lies within this LCT. The DFS (including lighting), catch pit, retaining walls, update to the junction with the B828, SuDS, Rest and Be Thankful car park and new active travel link, HESCO barrier extension and bund on the OMR would be additional elements. There would be notable verge widening to the inside bend opposite the B828. There would be occasional maintenance vehicles to the top level of the DFS required for removing debris and clearing the catch-pits. The magnitude of impact to the LCT would be moderate adverse during operation. There would be some localised impact on the Special Landscape Qualities (SLQs) but not to the extent that they would degrade the integrity of the landscape or damage the sense of place.	WY1 Moderate adverse SY15 Moderate adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
SLQ: Famous through routes	During operation the experience of the *famous through route* will have changed from the baseline scenario. The *famous through routes* SLQ would continue to have some localised changes. This would remain significant at SY15 due to the scale and nature of the change of experience of travelling through the DFS altering the historic perspective of the route for this section. The magnitude of impact is moderate.	WY1 Large adverse SY15 Large adverse
SLQ: Dramatic pass Rest and Be Thankful	During operation the experience of the *Dramatic Pass of the Rest and Be Thankful* will have changed from the baseline scenario. The SLQ would continue to have some localised changes. This would remain significant at SY15 due to the scale and nature of the change of experience of travelling through the DFS altering the perspective of the route for this section. The magnitude of impact is moderate.	WY1 Moderate adverse SY15 Moderate adverse

Table 22.3 - Chapter 10 Significant Residual Effects (Visual Effects) – Construction

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Viewpoint 2 OMR (representative of users of the OMR)	Construction activity would result in traffic management and would be visible in the foreground and along the OMR. The works to create the new bund, HESCO barrier extension, SuDS, culverts, wider bridge would all be clearly visible in the foreground to mid-distance. The magnitude of impact is major for a temporary period.	Very large adverse
Viewpoint 3A Forestry Path (representative of walkers on the path)	Construction activity would be visible from the forest path on the opposite side of the glen including felling to facilitate the DFS and associated maintenance access, and the addition of those features. The formation of the SuDS feature and extension to the HESCO bund would be visible in closer proximity. The impact magnitude is predicted to be major for a temporary period. The magnitude of impact is major for a temporary period.	Large adverse
Viewpoint 4 B828 (representative of users of the B828).	Construction activity would be clearly visible with the addition of the DFS, retaining wall at the west end of the DFS, and rock cutting being evident. Changes to the earthworks profile of the B828 and the addition of the proposed active travel route being seen in the foreground. The impact magnitude is predicted to be major for a temporary period.	Large adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Viewpoint 5 OMR at Glen Croe Farm (representative of residents of the farm and users of the OMR)	Construction activity on the A83 will be noticeable from the farm and is noticeable and audible from the OMR. Construction activity for the A83 including the DFS, and retaining walls, would be evident as would works on the OMR which including traffic management measures. The impact magnitude is predicted to be major for a temporary period.	Large adverse
Viewpoint 6 Rest And Be Thankful Car Park	Construction activity would have a direct impact on the car park area to facilitate the improvements to the car park, the new active travel route and the B828 / A83 junction. Rock cuts, the construction of the DFS and retaining wall, deflection walls, and culverts would be visible in close to mid-distance views. The extension to the HESCO barrier and SuDS feature would be perceptible in the distance. The impact magnitude is predicted to be major for a temporary period.	Very large adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Viewpoint 7 A83 Layby next to Loch Restil	Construction activity associated with the widening of the cutting on the B828 would be perceptible in the distance. The layby itself would be removed. The impact magnitude is predicted to be moderate for a temporary period.	Moderate adverse
Viewpoint 8 A83 Layby to the north of Loch Restil	Construction activity associated with the widening of the cutting on the B828 would be perceptible in the mid-distance. The impact magnitude is predicted to be moderate for a temporary period.	Moderate adverse
Viewpoint 10 Beinn an Lochain (walkers on waymarked trail)	The existing view is an elevated panorama. Below, is Loch Restil and Glen Croe. The A83 and B828 Glenmore are both readily perceptible. The OMR and Croe Water are also perceptible. Construction activity would be noticeable but at this elevation would not detract from the focus of the view. The impact magnitude is predicted to be moderate for a temporary period.	Large adverse
Viewpoint 11 Ben Donich (walkers on trail within LLTNP)	Construction activity would be evident across the entire mid-distance of the view span. The impact magnitude is predicted to be major given that Beinn Luibhean is centrally the focus of the view. This would be for a temporary period.	Very large adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Sequential Views A83	During construction A83 road users will be diverted to the OMR and therefore there will be no views from the A83. Views from the OMR will be at a lower elevation than the A83 but construction activity on the A83 will be visible. The magnitude of impact is minor in the context of the baseline frequency of diversions to the OMR.	Moderate adverse

Table 22.4 - Chapter 10 Significant Residual Effects (Visual Effects) – Operation

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Viewpoint 2: OMR	During operation, the new elements of the bund and SuDS would be somewhat softened by seeding and scattered trees would help soften the A83. However, the bund, HESCO barrier and its extension and culverts would still be obvious in close proximity from this location. The magnitude of change is moderate.	WY1: Large adverse SY15: Large adverse
Viewpoint 5 OMR at Glen Croe Farm (representative of residents of the farm and users of the OMR)	During operation, the DFS and associated lighting would be a new element in the view. The new structure elements may be perceptible from the house but not direct in views due to intervening vegetation in the property curtilages and outhouses. The HESCO barrier and widening, and culverts would be clearly visible from the OMR. The impact magnitude is predicted to be moderate.	WY1: Moderate adverse SY15: Slight adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Viewpoint 6 Rest And Be Thankful Car Park	During operation, the view would include the new car park elements and structural features (DFS and retaining walls) and lighting would be a new element. The HESCO barrier extension, bund, SuDS, culverts and widening of the OMR would be perceptible in the mid-distance. The impact magnitude is predicted to be moderate.	WY1: Moderate adverse SY15: Moderate adverse
Viewpoint 11 Ben Donich (walkers on trail within LLTNP)	During operation the new elements including the DFS and associated lighting, retaining walls, and extensions to the HESCO barrier, bund, widened bridge and culverts would be noticeable. The SuDS feature would not be perceptible due to topography and distance. The impact magnitude is predicted to be moderate.	WY1: Moderate adverse SY15: Moderate adverse
Sequential Views	During operation the experience of the A83 road user will be different as they will be approaching and then within the DFS so that the views will be slightly more restricted than existing for a short section of the route. The magnitude of change is moderate.	WY1: Large adverse SY15: Large adverse

Table 22.5 - Chapter 11 Significant Residual Effects (Biodiversity) – Construction

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
The Croe Water downstream of its eastern bifurcation, and High Glen Croe Tributary	There will be no direct losses affecting this receptor. Mitigation will protect it from indirect impacts such as pollution. The improved drainage in relation to the headwaters could benefit the Croe Water downstream of its eastern bifurcation, and High Glen Croe Tributary. Watercourse enhancements to deliver biodiversity net gain include enhancement works within this watercourse, and these will have a direct beneficial impact.	Large Beneficial

Table 22.6 - Chapter 14 Significant Residual Effects (Noise and Vibration) – Construction

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
OMR informal walking, cycling and horse-riding route	Increase in road traffic noise during construction phase when the OMR diversion route is in use. As the OMR diversion route and the OMR informal walking, cycling and horse-riding route are the same, it is not possible to mitigate the noise impact. No monitoring is required as it is not possible to mitigate the road traffic noise for users of the OMR informal walking, cycling and horse-riding route.	Significant Adverse
Laigh Glencroe	At Laigh Glencroe there will be a decrease in road traffic noise during construction phase when the OMR diversion route is in use. No monitoring is required for the beneficial effect.	Significant Beneficial

Table 22.7 - Chapter 15 Significant Residual Effects (Population and Human Health) – Construction

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Rest and Be Thankful Viewpoint	Potential impacts on Rest & Be Thankful viewpoint - disruption, temporary closure, changes to access and viability and amenity impacts	Large Adverse
Public open space and other community facilities within the study and wider area	Health and wellbeing outcome from disruptions, amenity impacts and changes in access to public open space and other community facilities within the study and wider area	Moderate Adverse
OMR	Temporary impact to the amenity of the journey during the construction period whilst a convoy system is required to transport WCHs. Whilst the LTS is being constructed WCH journeys along the OMR would be affected by the presence of traffic leading to an adverse impact to safety as well as amenity (related impacts being noise, air quality and visual).	Moderate Adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Route 6 and 11	Access would be severed during the construction period with no access possible to either the informal car park or the WCH route.	Very Large Adverse
Farm Holding No.1	Anticipated land take of 12.37ha (14.10%) and effective land take as a result of viability issues with some remaining land parcels of 13.8ha (15.72% of farmland) associated with 1 no. private farm holding	Moderate Adverse
Farm Holding No.1	Disruption to access and / or viability of agricultural buildings	Moderate Adverse
Farm Holding No.1	Severance issues at 1 no. private farm holding during construction works along OMR	Moderate Adverse

Table 22.8 - Chapter 15 Significant Residual Effects (Population and Human Health) – Operation

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Potential impacts on Rest & Be Thankful Car Park / Viewpoint	Potential impacts on Rest & Be Thankful Car Park / Viewpoint - Provision of an active travel link from the Rest and Be Thankful Car Park / Viewpoint to the forestry track west of the OMR	Moderate Beneficial
Community Assets	Potential impacts on Community Assets in wider study area - Improved access, safer and more reliable journeys along the A83.	Moderate Beneficial
Community Assets	Health and wellbeing benefits as a result of improved access, safer and more reliable journeys to community assets in the wider area	Moderate Beneficial
Community Participation and Interaction	Health and wellbeing impacts as a result of improved safety and reliability of journeys along A83 affording more resilient opportunities for community participation and interaction	Moderate Beneficial

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Potential impacts on Rest & Be Thankful Car Park / Viewpoint.	Provision of an active travel link from the Rest and Be Thankful Car Park / Viewpoint to the forestry track west of the OMR	Moderate Beneficial
Employment and business	Potential impacts on Employment and business opportunities in wider study area - Improved access, safer and more reliable journeys along the A83.	Moderate Beneficial
Employment and business	Health and wellbeing benefits as a result of improved access, safer and more reliable journeys in respect of employment and business opportunities in the wider area.	Moderate Beneficial
Education and training	Potential impacts on education and training opportunities in wider study area. Improved access, safer and more reliable journeys along the A83.	Moderate Beneficial
Education and training	Health and wellbeing benefits as a result of improved access, safer and more reliable journeys in respect of education and training opportunities in the wider area	Moderate Beneficial

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Health and social care services	Health and wellbeing benefits as a result of improved access, safer and more reliable journeys in respect of health and social care services in the wider area	Moderate Beneficial
Farm Holding No.1	Anticipated operational access and viability issues as a result of new field boundaries and loss of OMR ownership.	Moderate Adverse

Table 22.9 - Chapter 19 Significant Residual Effects (Road Drainage and Water Environment) – Construction

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Hydromorphology – 11 Tributaries of Croe Water	The intrusive nature of the works to build the DFS and associated catch pit will disrupt the natural sediment and hydrological flows and are predicted as a moderate adverse magnitude impact to these medium sensitivity receptors. Adherence to the Construction Environmental Management Plan (CEMP), which will include best practice methods and measures to manage the potential environmental impacts of construction works will minimise potential impacts as far as is practicable.	Moderate adverse
Water Quality – Croe Water	Increased sediment loading to Croe Water and upstream catchment during construction, given topographic challenges for standard sediment management techniques. This would be a temporary impact across the Croe Water catchment, which may extend beyond construction phase.	Moderate adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Water Quality – Tributaries of Croe Water	Increased sediment loading during construction to these tributary channels which have direct engineering interventions upstream, given topographic challenges for standard sediment management techniques. These would be temporary impacts, which may extend beyond construction phase for individual channels. Including for application of an escalating series of specific mitigation measures, predicted as a moderate adverse magnitude impact to these medium sensitivity receptors.	Moderate adverse

Table 22.10 - Chapter 19 Significant Residual Effects (Road Drainage and Water Environment) – Operation

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Hydromorphology – 8 Tributaries of Croe Water	The scale of the works to ensure that the A83 is appropriately protected are extensive and would further interrupt the flow and sediment regimes of these watercourses. To ensure the continuity of hydrological and sediment flows from upstream to downstream of the A83, as well as the long-term resilience of the downstream watercourses, several design principles have been embedded within the design of the catch pit, associated culverts and downstream watercourses. Applying specific mitigation for the frequent inspection and clearance of the catch pit and adaptive management of the watercourses downslope of the A83 result in a predicted moderate adverse magnitude impact to these medium sensitivity receptors.	Moderate adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Surface Water Resources – High Glen Croe Private Water Supply (PWS)	The intent is to replace the current private water supply source with an alternative that removes linkage to A83 carriageway runoff, this will provide a long-term improvement to water quality from both routine runoff and accidental spillage events. Applying specific mitigation for this replacement, this is predicted as a moderate beneficial magnitude impact to this medium sensitivity receptor.	Moderate beneficial
Water Quality – Routine Run Off, Croe Water	The installation of SuDS features introduces water quality treatment to runoff generated on the A83, which currently discharge untreated. This shall provide long-term improvement to water quality in the Croe Water (and upstream catchments). This is predicted as a moderate beneficial magnitude impact to this high sensitivity receptor.	Moderate beneficial

Table 22.10 - Chapter 20 Significant Residual Effects (Cumulative) – Construction

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
One private farm holding within Glen Croe (Farm Holding No.1).	Moderate adverse residual landscape effects to Loch Lomond and The Trossachs National Park (LLTTNP) as a result of construction activities, therefore impacting on the wider setting of the private farm alongside a moderate adverse effect anticipated due to land take, viability and severance issues.	Significant Adverse
Watercourses	Potential biodiversity impacts include degradation through pollution and disturbance of aquatic species. Enhanced habitats will make a positive contribution to biodiversity net gain, resulting in a large beneficial residual effect. Adverse residual effects for hydropmorphology, road water drainage and flood risk anticipated on watercourses during construction.	Significant Beneficial and Adverse
Walking, Cycling and Horse-Riding (WCH) Routes	Significant adverse effects to views of users on WCH routes and amenity of the routes. Adverse effects to health and wellbeing outcomes from disruptions. A very large adverse effect has been identified to the Special Landscape Quality (SLQ) for Dramatic Pass Rest and Be Thankful, Famous Through Roads and Tranquillity.	Significant Adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Rest and Be Thankful car park	A large adverse effect has been identified on the Rest and Be Thankful viewpoint, due to disruption, temporary closure, changes to access, viability and amenity impacts. A very large adverse effect has been identified to the Special Landscape Quality (SLQ) for Dramatic Pass Rest and Be Thankful and Famous Through Roads. Construction activity would have a direct impact on the car park area to facilitate the improvements to the car park, the new WCH route and the B828 / A83 junction so a large adverse effect is anticipated.	Significant Adverse

Table 22.11 - Chapter 20 Significant Residual Effects (Cumulative) – Operation

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Two residential receptors (High Glencroe and Laigh Glencroe)	There is a slight beneficial residual effect to the two properties with direct access from A83 and OMR. This would be due to improved access provisions along OMR, and with the A83 fully operation there would be reduced disturbance on the OMR. This would subsequently have a minor beneficial effect on health and wellbeing. Moderate beneficial residual impact at High Glencroe due to provision of alternative PWS source, resulting in a long-term beneficial impact on water quality associated with the supply and permanently remove any potential for the supply to be affected by pollutants associated with routine runoff from the A83.	Significant Beneficial
One private farm holding within Glen Croe (Farm Holding No.1).	There are likely to be moderate adverse residual effects due to anticipated operational access and viability issues as a result of new field boundaries and loss of OMR ownership. Adverse effect due to changes to landscape character and/or Special Landscape Qualities (SLQs) as a result of removal of landscape features, additional new permanent engineering measures.	Significant Adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
Watercourses	Beneficial residual effects are anticipated for routine run off and risk of accidental spillages to waterbodies. For medium sensitivity watercourses a moderate adverse effect on hydromorphology is anticipated on eight watercourses, a slight adverse residual effect on five watercourses, a neutral residual effect is anticipated on four watercourses and one watercourse has a slight beneficial effect. For low sensitivity watercourses a slight adverse effect on hydromorphology is anticipated on seven watercourses, and a neutral residual effect on 19 watercourses. A slight adverse residual effect for flood risk is anticipated for all flood risk receptors (One Most Vulnerable, 12 Highly Vulnerable, five Least Vulnerable and one Essential Infrastructure). Refer to Volume 4, Appendix 19.6 Flood Risk Assessment for a list of identified receptors. There would be a slight beneficial significant residual effect to the headwaters/Minor Tributaries of the Croe Water, including the eastern bifurcation of the Croe Water flowing under the A83 and Croe Water downstream of its eastern bifurcation, and High Glen Croe Tributary. It is likely road drainage design under the Proposed Scheme could provide betterment over the existing scenario in terms of river water quality.	Significant Beneficial and Adverse

Receptor	Summary of Significant Residual Effects	Significance of Residual Effects
WCH routes	Adverse residual effects are anticipated to viewpoints from the WCH routes due to new elements including the DFS, retaining walls, and extensions to the HESCO barrier would be noticeable. There is likely to be a moderate beneficial residual effect to WCH routes due to improved access, safer and more reliable journeys along the A83 alongside moderate beneficial health and wellbeing benefits as a result of this improved access. A large adverse effect has been identified to the SLQ for Famous Through Roads. A moderate adverse effect has been identified to the SLQ for Dramatic Pass Rest and Be Thankful.	Significant Beneficial and Adverse
Rest and Be Thankful Car Park	Provision of an active travel link from the Rest and Be Thankful car park and Viewpoint to the forestry track west of the OMR would create a moderate beneficial residual effect. A large adverse effect has been identified to the SLQ for Famous Through Roads. A moderate adverse effect has been identified to the SLQ for Dramatic Pass Rest and Be Thankful.	Significant Beneficial and Adverse