1. Introduction

1.1 Background and Site Description

1.1.1 Bluebell Wind Farm Limited (hereafter known as 'the Applicant') submitted the planning application for Lochluichart Wind Farm Extension II on 12th April 2019 to the Highland Council (THC), for a 9-wind turbine scheme and associated infrastructure (hereafter known as the 'Original Scheme'). The application was accompanied by an Environmental Impact Assessment Report (hereafter known as the 'EIA Report' (Infinergy, April 2019), and associated documents, under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2018.

1.1.2 Following submission of the application, THC consulted relevant organisations as well as the public. Following receipt of consultation responses, the Applicant considered matters raised and has undertaken further work where appropriate; the submission of Supplementary Information (SI) is the outcome.

1.1.3 The Scottish Natural Heritage (SNH) see Appendix 1.A, Ref: CNS/REN/WF/INV/Lochluichart Extension II), raised concerns about the visual impact of the Original Scheme on the A835, impacts of turbine location on blanket bog and areas of deep peat.

1.1.4 Scottish Environmental Protection Agency (SEPA) see Appendix 1.B, Ref: PCS/164984), objected and raised a number of concerns about the Original Scheme, including site design, location of infrastructure and request for more detailed information.

1.1.5 Highland Island Airport Limited (HIAL) objected to the Original Scheme (Appendix 1.C, Ref: 2016/0053/INV), and requested additional reporting showing the impact the Original Scheme has on Line of Sight from Inverness Airport.

1.1.6 Scotways objected to the Original Scheme (Appendix 1.D Ref: 19/01284/FUL), and raised concerns about baseline assessment and impact assessment.

1.1.7 The site layout has redesigned in response to this feedback. In summary, 4 turbines have been removed from the scheme (turbines T2, T3, T9 & T10, the turbines closest to the A835) along with the associated access tracks and infrastructure. In addition, turbine T4 has been micro-sited 24m to avoid being sited in an area of deep peat.

1.1.8 The remaining five turbines, and their associated infrastructure including proposed borrow pits, remain in the same locations as per the Original Scheme. The proposed substation, control building and construction compound has been reduced in scale to 170m x 80m dimensions. This 5-turbine scheme promoted in this SI for Lochluichart Wind Farm Extension II is hereafter known as the 'Revised Development'.

1.1.9 The re-design process has involved site evaluation, environmental appraisal and further consultation with THC, SEPA, SNH, HIAL & Scotways. Additional studies have been commissioned by the Applicant to inform the re-design

process, to assess the environmental effects associated with the Revised Development and also to address concerns raised by concerns.

1.2 Structure of the Supplementary Information

1.2.1 The SI is split into three volumes, with the NTS forming a separate document. Volume 1 of the SI contains written statements informing each area of assessment considered throughout the EIA process. The SI needs to be read in conjunction with the EIA Report.

1.2.2 Volume 2 contains the figures that inform the SI.

1.2.3 Volume 3 contains supporting information and appendices for each of these technical chapters, and additional studies that have been prepared to inform the relevant assessments as reported in the SI.

1.3 Document Structure

1.3.1 The SI provides details of the application consultation responses, description of changes to the site layout and reports the change in the significance of effects resulting from the Revised Development.

1.3.2 The SI comprises the following documents:

Non-Technical Summary

Volume 1: Written Statement (this volume); and

Volume 2: Figures

Volume 3: Appendices

1.3.3 Figures have been updated, where appropriate, to illustrate the findings of this report.

1.3.4 The SI is limited to identifying the change in effects resulting from the Revised Development from those described within the EIA Report. The SI maintains the same structure as the EIA Report covering the following information.

1.3.5 The assessment was undertaken by the following technical consultancies and in-house by Infinergy (see Table 1.0).

Table 1.0: Revised Development SI Chapter Structure/Consultant responsibility

Section Number	Title	Project Role
1	Introduction	Infinergy
2	EIA Process	Infinergy
3	Project Description	Infinergy
4	Planning Policy	Savills
5	Climate Change Policy Carbon	Arcus
6	Socio-Economic	Arcus
7	Traffic & Transport	Arcus
8	Noise	Arcus
9	LVIA	OPEN
10	Cultural Heritage	Headland Archaeology
11	Ecology	Avian Ecology
12	Ornithology	Avian Ecology
13	Hydrology & Hydrogeology	Arcus
14	Shadow Flicker & Safety	Infinergy
15	Infrastructure	Infinergy
16	Forestry	Neil McKay

1.4 Availability of the Supplementary Information

1.4.1 The SI and the supporting documentation are also available online; please visit the dedicated website at www.lxxwindfarm.co.uk, under News/Downloads. A copy of the NTS and a CD containing the full EIA Report are available free of charge (while stocks last), by contacting Infinergy Limited at info@lxxwindfarm.co.uk or in writing to **Freepost Infinergy Limited** (no stamp or further address detail necessary). If required, a hard copy of the entire EIA Report can be provided at a cost of £750 plus VAT.

1.4.2 Copies of the EIA Report will also be available to view during opening hours at the following locations:

- Garve Village Hall
  Garve
  Ross-Shire
  IV23 2PR

- The Highland Council
  Ross House
  Dingwall
  IV15 9RY

1.5 Representations to the Applicant

1.5.1 Any representations to the application should be made directly to the Highland Council.

2. EIA Process

2.1 Overview

2.1.1 Chapter 2 of the EIA Report describes the process for the Development. The process and principles outlined in that chapter have been carried through to the post-submission stage and remain valid for the preparation of the SI.

2.1.2 The findings of the EIA were presented in the EIA Report submitted April 2019. The revisions to the Original Scheme which are considered within this SI related to the removal of 4 turbines and associated infrastructure as described in Section 3.

2.1.3 Environmental effects have therefore already been considered for a larger scale development scenario than that considered within the SI. The SI focuses on outlining the change in predicted effects arising from the Revised Development.

2.2 EIA Methodology

2.2.1 The SI has been prepared following a systematic approach to EIA and project design following the principles outlined within Chapter 3 of the EIA Report. Since submission of the EIA Report, the further key elements have been:

- Consultation on the application and EIA Report;
- Revision of project design with input from the EIA team;
- Further consultation on the Revised Development;
- Preparation of the SI; and
- Submission of the SI and required advertising procedures.

3. Description of the Revised Development

3.1 Revised Site Layout

3.1.1 The main components of the Lochluichart Wind Farm Extension II remain as described in Chapter 3 of the Environmental Impact Assessment Report (hereafter known as the 'EIA Report' (Infinergy, April 2019) for the Lochluichart Wind Farm Extension II (hereafter known as the 'Original Scheme'). The Revised Development will comprise five wind turbines with a maximum tip height of 133m and an installed capacity, based on the candidate 3.6MW turbine, of 18MW. This is a reduction of 4 turbines (turbines T2, T3, T9 & T10 have been removed) from the Original Scheme. The turbine co-ordinates for the Revised Development can be found in Table 3.0.

Table 3.0 Revised Development Turbine Co-ordinates

Turbine No.	X(East)	Y(North)
4	234009	868766
5	233268	868761
6	232668	868596
7	232633	868934
8	232183	869027

Turbines

3.1.2 There is no change to the proposed turbine dimensions from the EIA Report. The Applicant is committed to installing infra-red lighting, as installed at the Operational Lochluichart Wind Farm, to avoid any potential light pollution impacts on the Wild Land Area nearby, following a request from SNH and in their response to the Original Scheme, a matter which the MoD is also comfortable with (see Appendix 3.A).

Crane Hardstanding Areas

3.1.3 There is no change to the proposed crane hardstanding areas from the EIA Report.

Construction Compound

3.1.4 There is no change in the dimensions of the proposed construction compound from the EIA Report.

Transformers and Cables

3.1.5 The applicant is happy to commit to procuring turbines, subject to a consent being achieved, which feature internal transformers, following feedback from THC.

3.1.6 The electrical cables will be routed alongside the access tracks, and buried to a depth of typically 1m.

Sub-Station/Control Building/Battery Array

3.1.7 There is a change in the dimensions of the proposed sub-station and control building, in response to feedback from SEPA. The Substation/Control Building/Battery Array has been reduced in scale to 66m x 30m (see updated Figure 3.5) which also includes added bunding detail.

On-Site Access Tracks

3.1.8 There is no change to the proposed construction method for access tracks as described in the EIA Report. There will, however, be a reduction in the requirement for permanent access tracks to the turbines of approximately 2km. As shown in Figure 3.1, the internal track alignment has been refined in order to serve the revised turbine locations.

Decommissioning Bond

3.1.9 THC made a request of the applicant to provide some suitable wording for a Decommissioning Bond. Based on the applicant's involvement in the

consented Tom nan Clach Repowering scheme, some proposed wording can be found in Appendix 3.B.

4. Planning Policy

4.1 The planning policy framework and the renewable energy policy context remain as set out in Chapter 4 of the EIA Report.

5. Climate Change

5.1 Non-Technical Summary

5.1.1 The predicted future climatic baseline conditions are highly unlikely to affect the operation of the Revised Development. The Revised Development will have a positive effect on carbon savings, and a positive effect when considered cumulatively with UK-wide renewable energy deployment. No additional significant effects to those already identified within the EIA Report will occur as a result of climate change during the operational phase the Revised Development.

5.1.2 As such, the effect of the Revised Development on climate change is not significant.

5.2 Introduction

5.2.1 This chapter of the Supplementary Information (SI) addresses the potential effects of the 5-turbine Lochluichart Wind Farm Extension II (see Chapter 3 for further information, and hereafter known as 'the Revised Development') on Climate Change. It supplements Chapter 5: Climate Change of the 2019 Environmental Impact Assessment Report (hereafter known as the 'EIA Report'), which supported the application for the 9-turbine Lochluichart Wind Farm Extension II (hereafter referred to as 'the Original Scheme'), and should be read in conjunction with it.

5.2.2 For the purposes of the SI, the candidate turbine remains the same as the EIA Report for the Original Scheme, the Senvion 3.6MW114 (3.6MW) was used as a reference wind turbine. It is noted that the turbine dimensions will vary depending on final turbine selected.

5.2.3 Key conclusions of the EIA Report in terms of climate change (Paragraphs 5.70 – 5.73) are as follows:

- The Revised Development will not significantly influence climate change;
- The Revised Development will have a positive cumulative effect with regards to reduction in carbon emissions when considering the UK-wide electricity generation mix;
- In regards to carbon balance, the Revised Development layout has been designed to minimise disturbance to peat and carbon losses by avoiding deep peat where possible, and through the proposed construction approach, for example the use of floating tracks; and

- The effect of the Revised Development on climate change is not significant in terms of the EIA Regulations.

5.2.4 The methodology of the EIA Report remain valid and appropriate and therefore have not been reassessed for this SI, unless otherwise stated.

5.3 Legislation, Policy and Guidance

5.3.1 Digest of United Kingdom Energy Statistics (DUKES) 2019 updates the DUKES (2018) as detailed in Paragraph 5.39 of the EIA Report.

5.3.2 In 2018, there was a continuation of the switch in the main sources of electricity generation away from coal and gas to renewables. Generation from coal fell by 25%, gas fell by 3.8%, whilst renewables rose by 12%. Renewables' share of generation was at a record high level of 33.0% in 2018, up from 29.2% in 2017, due to increased wind, solar and plant biomass capacity.

5.3.3 No other change to Climate Change policy or guidance had occurred since the EIA Report was submitted. However, future baseline data has been updated, as per Section 5.4.2 of the Chapter.

5.4 Assessment Methodology and Significance Criteria

5.4.1 All significance criteria used within the SI will remain as stated in the EIA Report. Details of the criteria can be found in Chapter 5 of the EIA Report (Paragraphs 5.25 – 5.28).

5.4.2 The assessment methodology has been updated with the availability of the UK Climate Projections 2018 (UKCP18), which will become the current projection for assessment of climate change, as well as the State of the UK Climate 2017 report, which provides the latest data on the observed climate for the UK. This supersedes the UK Climate Projection Report: The Climate of the UK and Recent Trends, as detailed in Paragraph 5.30 of the EIA Report.

5.4.3 UKCP18 uses scenarios for future greenhouse gas emissions called Representative Concentration Pathways (RCPs). UKCP18 provides four different pathways/scenarios which together attempt to capture a range of potential alternative futures and outcomes linked to global temperature increases and include a wide variety of assumptions on socio-economic development and commitment to emissions reductions.

5.4.4 The sensitivity of the scenario responses is much more pronounced in the second half of the 21st Century in comparison to the first half of the Century.

5.4.5 Over the anticipated 25-year operational lifetime of the Revised Development, the climate change scenario is therefore not as pronounced on the outcome of the assessment (i.e. as within the first half of 21st Century).

5.4.6 Where a scenario is required to determine the future baseline, the medium emissions scenario RCP 6.0 is used, where data is available.

5.4.7 Projections are reported for 20-year time periods through to 2100. The 2020-2039 and 2040-2059 time periods provide the relevant information covering the expected operational phase of the Revised Development (anticipated 2023 - 2048).

5.4.8 As per the EIA Report, projected climatic changes at the 50% probability level are utilised, unless otherwise indicated. This probability level is the central estimate of possible outcomes, over the lifetime of the Revised Development.

5.4.9 The UK Climate Projections Land Report has been used to source the UKCP18 data unless otherwise stated.

5.4.10 All sources of information and references used in the EIA Report are still applicable and there are no changes noted, with the exception of the use of the UKCP18 for climate predictions.

5.4.11 The following assessment areas are assessed within this chapter and are unchanged from the EIA Report:

- The vulnerability of the Revised Development to climate change;
- The influence of the Revised Development on climate change; and
- A summary of effects on environmental receptors sensitive to climate change.

5.4.12 The assessment methodology for the influence of the Revised Development on Climate Change remains unchanged from the EIA Report; however, the inputs to the carbon calculator have been amended with regards to the Revised Development. These are detailed in Appendix 5.A.

Assessment Limitations

5.4.13 As per Paragraph 5.24 of the EIA Report, it is important to note that the climate change projections are based on global models for a range of greenhouse gas emissions scenarios and generally consider regional responses to climate change rather than local.

5.4.14 As understanding of the climate system and ability to model it improves it is likely that future projections will be refined on an ongoing basis.

5.4.15 The probabilities presented and the estimated ranges are based on a set of modelling, statistical and dataset choices with expert judgement playing an important role. However, as some potential influences on future climate are not yet known, some choices could change as the science develops.

5.5 Responses and Consultation

5.5.1 No responses directly relating to climate change were received to the EIA Report.

5.6 Baseline Conditions

Climate Projections

5.6.1 The study area and potential climate change receptors remains unchanged from the EIA Report, and so remains applicable and valid for the Revised Development with the exception of climate projections, which have since been updated.

5.6.2 The baseline conditions are based on the UKCP18 data, and the findings from which that are published in The UK Climate Projections Land Report (2018). Additionally, the State of the UK Climate 2017, which provides the latest report

on observed climate data for the UK has been used and should be considered as an updated projection alongside Table 5.2 in Chapter 5 of the EIA Report.

5.6.3 The key projection findings (Page 2) are as follows:

- *"The decade 2008-2017 has been on average 0.3°C warmer than the 1981-2010 average, and 0.8°C warmer than 1961-1990. Nine of the ten warmest years have occurred since 2002 and all since 1990;*
- *In the last few decades there has been an increase in annual average rainfall. Seven of the wettest years for the UK have occurred since 1998;*
- *In context of seasonal changes, of note is that two recent winters (2013/2014 and 2015/2016) have the highest rainfall in the dataset. There has also been a run of recent wet summers with only 2013 in the last ten being below the 1981-2010 average. UK summers for the last decade have been on average 20% wetter than 1961-1990 (17% higher than 1981-2010);*
- *There is no compelling evidence for trends in storminess as determined by maximum gust speeds over the last four decades;*
- *In terms of extremes, the amount of rain from extremely wet days has increased by 17% for the decade 2008-2017 compared with the 1961-1990 period, with changes largest for Scotland. The hottest day of the year last decade has been on average 0.8°C above the 1961-1990 reference. The lowest temperature of the year has increase by 1.7°C, a much larger increase than the equivalent change in the mean UK temperature; and*
- *Mean sea level around the UK has risen by approximately 1.4mm/year from the start of the 20th century, when corrected for land movement."*

5.6.4 Climate projections show that trends over the 21st Century in the UK are towards warmer and wetter winters, and hotter, drier summers, with an increase in the frequency and intensity of extremes.

5.6.5 As per Paragraph 5.32 of the EIA Report, the climate parameters considered most relevant to the assessments referenced within this Chapter are wind speed, precipitation and temperature.

Wind Speed

5.6.6 Global projections over the UK show an increase in near surface (10m height) wind speeds for the second half of the 21st Century for the winter season, which is accompanied by an increase in frequency of winter storms in the UK.

5.6.7 For North Scotland, projected summer wind speeds for 2020-2039 and 2040-2059 (compared to the 1981-2000 baseline) under RCP 6.0 indicates a reduction in wind speed of -0.2 m/s in summer, and -0.1 m/s in winter[i]. This equates to around a reduction of 0.4 knots. This is a minimal change compared with the typical magnitude of summer mean wind speeds for Scotland which is between 7 – 14 knots, and the mean observed winter wind speed value of between 10 - 24 knots over Scotland.

Precipitation

5.6.8 Based on UKCP18, the precipitation projections for North Scotland for 2020-2039 and 2040-2059 (relative to the 1981-2000 baseline) is predicted at +6% to +10% for winter seasonal mean precipitation, and -10% to -13% for summer seasonal mean precipitation, at the 50% probability level for RCP 6.0.

Temperature

5.6.9 Observations show an annual warming in the UK in recent decades with more warming predicted in the summer than in the winter. In the summer there is a pronounced north/south contrast, with considerable increases in maximum summer temperatures over the southern UK compared to northern Scotland.

5.6.10 For the period 2020-2039, changes to annual mean temperature (relative to 1981-2000) is projected at +1.0°C, at the 50% probability level for RCP 6.0 which is the central estimate.

5.6.11 For the period 2040-2059, projected changes to the mean annual temperature in northern Scotland (compared to the 1981-2000 baseline) is projected at +1°C to 2°C (50% probability) for RCP 6.0.

5.7 Assessment of Potential Effects

5.7.1 The following assessment areas are considered in terms of the Revised Development:

- The vulnerability of the Revised Development to climate change;
- The influence of the Revised Development on climate change; and
- A summary of effects on environmental receptors sensitive to climate change.

Vulnerability of the Revised Development to Climate Change

5.7.2 This assessment has been updated to consider the UKCP18 in terms of wind resources.

5.7.3 Based on global projections over the UK, there is expected to be an increase in near surface (10m height) wind speeds from 2050 onwards for the winter season, which is accompanied by an increased in the frequency and magnitude of storms.

5.7.4 For Scotland, projected summer wind speeds for 2020-2039 and 2040-2059 (compared to the 1981-2000 baseline) under RCP 6.0 project a minor reduction in wind speed of -0.2 m/s in summer, and -0.1 m/s in winter. This equates to around a reduction of approximately 0.4 knots.

5.7.5 Given the limited magnitude of the impact and the negligible sensitivity of the Revised Development as an environmental receptor, there is no significant effect in terms of the EIA Regulations predicted as a result of reduced wind speeds during the operational phase of the Revised Development.

Influence of the Revised Development to Climate Change

Carbon Saving

5.7.6 The carbon budget has been recalculated based on the Revised Development, taking into consideration the reduction in turbines and associated infrastructure change, for example a reduction in the required track construction within peatland, and reduction in forestry felling.

5.7.7 The Revised Development (based on the candidate turbine described in Chapter 3 of the EIA Report) has an anticipated installed capacity of 18MW.

5.7.8 Based on the average capacity factor, 34%, it is expected the Revised Development would result in the production of 53,611 MWh annually, equating to 1,340,280 MWh throughout the operational life of the Revised Development.

5.7.9 The carbon savings for the Revised Development have been recalculated (as per Appendix 5.A) and are presented in Table 5.1 below:

Table 5.1: Carbon Savings for the Revised Development (Expected Scenario)

Fuel Source	**Estimated Minimum CO_2 saving (tCO_2yr^{-1})**	**Estimated Maximum CO_2 saving (tCO_2yr^{-1})**
Coal fired electricity generation	47,768	50,663
Grid mix electricity generation	14,615	15,501
Fossil fuel mix electricity generation	23,936	25,386

Carbon Losses

5.7.10 The Carbon Losses have been recalculated for the Revised Development for the purposes of this SI, and are provided in Table 5.2 below. The Carbon Calculator is included as Appendix 5.A of the SI.

Table 5.2: Carbon Losses for the Revised Development (Expected Scenario)

Losses	**t C02 Equivalent (total for wind farm lifetime)**
Losses due to turbine life (e.g. manufacture, construction, decommissioning)	15,183
Losses due to back-up	9,067
Losses due to reduced carbon fixing potential	141
Losses from soil organic matter	8664
Losses due to Dissolved Organic Carbon (DOC) and Particulate Organic Carbon (POC) leaching	3.46
Losses due to felling forestry	673
TOTAL LOSSES	33,731

Payback Period

5.7.11 The payback period has been recalculated using the updated carbon costs and carbon gains associated with the Revised Development.

5.7.12 The estimated payback period for the Revised Development is 2.2 years compared to grid-mix electricity generation. In comparison to fossil fuel mix and coal-fired electricity generation the payback period of the Revised Development reduces to 1.3 to 0.7 years respectively. Table 5.3 below goes into further detail regarding the carbon payback period for the Revised Development.

Table 5.3: Payback in years for each scenario used in the Carbon Calculator

Compared to:	Expected Scenario	Best Case Scenario	Worst Case Scenario
Coal fired electricity generation	0.7	0.6	0.7
Grid-mix electricity generation	2.2	2.1	2.3
Fossil fuel-mix of electricity generation	1.3	1.3	1.4

5.7.13 This payback period for the Revised Development remains a negligible, positive environmental effect that is not significant under the EIA Regulations.

Effects on Environmental Receptors Sensitive to Climate Change

5.7.14 No change based on Revised Development as detailed in Paragraphs 5.54 – 5.59 of the EIA Report.

5.8 Assessment of Cumulative Effects

5.8.1 The reduction in turbines will reduce the Revised Development's installed capacity from 32.4MW to 18MW, which will reduce the contribution to Scotland and the UK's carbon reduction targets.

5.8.2 Despite the reduction in turbine numbers, the Revised Development will present a major, positive, environmental effect in cumulation with other UK renewable energy generation, which is considered to be a fundamental change in the climate effects of UK energy supply.

5.9 Mitigation Measures and Residual Effects

5.9.1 This Chapter identified that no significant negative effects on climate change are anticipated and therefore no mitigation is required under the EIA Regulations or recommended as best practice.

5.9.2 An iterative design approach was taken for the Revised Development to avoid siting infrastructure in deep peat where possible to minimise disturbance of peat soils and associated carbon losses. Further micro-siting will be informed by detailed pre-construction ground investigations.

5.9.3 An Outline PMP has been produced and is provided as Appendix 13.B. The Outline PMP calculates an estimated volume of excavated peat of 27,150 m^3, of which 15,508 m^3 acrotelmic peat (generally within the upper 0.5 m of peat

deposit) and 6,642 m^3 catotelmic peat. An updated Peat Slide Risk Assessment is provided as Appendix 13.C.

5.9.4 As per Paragraph 5.66 of the EIA Report, the proposed reuses of the excavated peat are in line with the Scottish Renewables and SEPA Guidance, and the Outline PMP demonstrates that all excavated peat will suitably be reused on-site. The proposed reuses include the reinstatement of access track verges, cut and fill embankment slopes, reinstatement of turbine hardstandings, reinstatement of borrow pits and general landscape fill. No additional treatment of the peat is anticipated to be required, although methods to encourage regeneration of vegetation cover are likely to be required in some areas due to use of catotelmic peat to provide the top layer of reinstatement where there is a deficit of acrotelmic peat.

5.10 Summary

5.10.1 An assessment of the Revised Development has updated the Future Baseline, alongside availability of the UK Climate Projections Report 2018 (UKCP18), and the Carbon Calculator which assesses the Influence of the Revised Development to Climate Change.

5.10.2 Following this, there has been no change of conclusions from the EIA Report. The Revised Development will not significantly influence climate change receptors however, will have a positive cumulative effect with regards to reduction in carbon emissions when considering the UK-wide electricity generation mix.

5.10.3 As such, the Revised Development will not have significant negative effects on climate change.

References

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UKCP18 Science Overview Report: November 2018 [Online] Available at: https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Overview-report.pdf (Accessed 23/07/19)

6. Socio-economics, Tourism & Recreation

6.1 Non-Technical Summary

6.1.1 This Chapter provides the details of the changes to the site layout and the updated assessment of the significance of effects on Socio-economics, Tourism & Recreation receptors as a result of the Revised Development.

6.1.2 To ensure consistency of approach, the same significance criteria and assessment methodology has been followed to provide an assessment of the effects of the Revised Development.

6.1.3 In summary, the removal of the four turbines and associated infrastructure is likely to result in a minor reduction in the beneficial effects on socio-economics, and a minor reduction of adverse effects on tourism, recreation and land use.

6.1.4 The effect of the Revised Development on Socio-economics, Tourism & Recreation, and Land-Use is not significant.

6.2 Introduction

6.2.1 This Chapter of the Supplementary Information (SI) addresses the potential effects of the 5-turbine Lochluichart Wind Farm Extension II (see Chapter 3 for further information, and hereafter known as 'the Revised Development') on Socio-economics, Tourism and Recreation. It supplements Chapter 6: Socio-economics, Tourism and Recreation of the 2019 Environmental Impact Assessment Report (hereafter known as the 'EIA Report'), which supported the application for the 9-turbine Lochluichart Wind Farm Extension II (hereafter referred to as 'the Original Scheme') and should be read in conjunction with it.

6.2.2 The methodology detailed in the EIA Report remain valid and appropriate and therefore have not been reassessed for this SI, unless otherwise stated.

6.2.3 For the purposes of the SI, t/he candidate turbine remains the same as the EIA Report for the Original Scheme, the Senvion 3.6MW114 (3.6MW) was used as a reference wind turbine. It is noted that the turbine dimensions will vary depending on final turbine selected.

6.2.4 Key conclusions of the EIA Report are as summarised in Sections 6.9 – 6.1.

6.2.5 No significant effects in terms of the EIA Regulations are predicted on socio-economics, tourism and recreation and land-use receptors during the construction, operation or decommission phases of the Revised Development.

6.2.6 Capital Expenditure (CAPEX) is expected to be £42.77million (m) over the lifetime of the Development (25 years), based on 32.4MW.

6.2.7 Operational Expenditure (OPEX) is expected to be in the region of £1.9m per annum.

6.2.8 There is a limited number of formal recreational opportunities within the immediate area, with more opportunities within the wider area.

6.2.9 No significant or recreational effects on tourism or recreation as a result of the Revised Development, in isolation or cumulatively.

6.2.10 Contributions of the Revised Development to a local community benefit fund are approximately £162,000 per annum (equating to £4.05m over the lifetime of the Revised Development).

6.3 Legislation, Policy and Guidance

6.3.1 No changes have been noted in terms of policy regarding socio-economics, tourism and recreation receptors presented in Chapter 6 of the EIA Report.

6.4 Assessment Methodology and significance Criteria

6.4.1 The assessment methodology and significance criteria used within the SI report remains as stated in the EIA Report with regard to socio-economics, recreation and tourism. Details of the methodology can be found in Chapter 6 of the EIA Report.

6.4.2 The sources of information/references used in the EIA Report are still applicable and there are no changes noted.

6.5 Responses and Consultation

6.5.1 Table 6.1 presents a summary of the consultation response received in relation to socio-economics and recreation following the submission of the EIA Report.

Table 6.1: Consultation Responses

Consultee	*Date*	*Summary of Response*	*Response*
John Muir Trust	7th May 2019	The John Muir Trust objected to the application by Bluebell Wind Farm Limited on behalf of Infinergy. The Trust does not support construction of industrial-scale wind energy developments on wild land or developments that would impact adversely on wild land. The Trust is concerned impact about the cumulative impact of the Revised Development in terms of combined visibility. The Trust also believes there is increasing evidence that as the number of wind farms and turbines increases, so does the negative view of these developments by	As detailed in Section 6.106 – 6.123, no significant effects in terms of tourism and recreation are anticipated. As stated in Section 1.35 – 1.40 of this Chapter, the Revised Development will not result in significant effects on tourism and recreation.

Consultee	*Date*	*Summary of Response*	*Response*
		resident and visitor alike.	
SNH	10th May 2019	This proposal will result in significant landscape and visual impacts on the A835, an important and popular tourist route and a gateway to the west coast of Scotland. The visibility would affect road uses travelling east, where the proposed turbines would draw the eye and detract from views to Ben Wyvis which forms a key landscape feature on this route. The A835 is an important tourist route, linking Inverness to Ullapool and the scenic west coast with this part of the route. Visibility of the turbines from Ben Wyvis and Beinn a'Chasteil do not neatly fit with the existing wind farms and result in the cluster appearing to sprawl to the north. The likely landscape and visual impacts of the proposal could be mitigated by improvements to the design of the wind farm.	The landscape and visual impacts of the Revised Development are assessed in Chapter 9 of the EIA Report and Chapter 9 of the SI.
ScotWays	15/05/19, 12/08/19, 30/10/19 etc.	ScotWays has identified that the Applicant's baseline does not correctly reflect the extent of the recreational routes, including designated walking routes, within the study area. ScotWays	Figure 6.1 was been revised prior to the submission of the SI and additional clarification provided (see Appendix 1D).

Consultee	*Date*	*Summary of Response*	*Response*
		therefore objects to the application.	
Mountaineering Scotland	Not dated	Mountaineering Scotland objects to the Revised Development on grounds of visual impacts. Mountaineering Scotland believe the scheme would have major adverse visual impacts from the surrounding mountain top viewpoints, that cannot be mitigated, and that this would result in adverse impacts on mountain tourism and recreation.	The landscape and visual impacts of the Revised Development are assessed in Chapter 9 of the EIA Report and Chapter 9 of the SI. As detailed in Section 6.106 – 6.123, no significant effects in terms of tourism and recreation are anticipated. As stated in Section 1.35 – 1.40 of this Chapter, the Revised Development will not result in significant effects on tourism and recreation.

6.6 Baseline Conditions

6.6.1 The methodology will remain unchanged from the EIA Report and the majority of the baseline conditions (with the exception of the updated recreational routes detailed on Figure 6.1), including the study area and potential receptors, will remain applicable and valid for the Revised Development.

6.7 Assessment of Potential Effects on Socio-Economics

Local Investment

6.7.1 Given the Revised Development will be reduced to 5 turbines; the revenue/local investment will drop proportionately to that presented in the EIA Report.

6.7.2 The Lochluichart Community Trust (LCT) was established as a result of the community benefit which flowed from the Operational Schemes and from the Ledgowan hydro scheme.

6.7.3 The Revised Development will be open to investment from community organisations and social enterprises up to a maximum of 10% of the project

most likely via a 'shared revenue' model, one of the options proposed in the "Good Practice Principles".

Wider Economic Benefits

6.7.4 In terms of potential supply chain benefits, the Revised Development provides opportunities for the involvement of local, regional and Scottish suppliers in a range of activities, including research and development, design, project management, civil engineering, component fabrication / manufacture, installation and maintenance.

6.7.5 In addition, during the construction process there will be opportunities where those employed will develop skills that will be of benefit to the local economy and to local businesses in the longer term. Further, employment generated through the Revised Development will contribute to diversifying the local economy and help support the retention in the area of the working age population.

6.7.6 Although the Revised Scheme will result in a reduced economic benefit on the supply chain, the reduced effect will not be discernible at a local, regional or national level and remain not significant in terms of the EIA Regulations.

Construction Effects

6.7.7 The removal of 4 turbines form the EIA Report will result in a reduction in the CAPEX, as this is estimated per MW, which will reduce from 32.4MW to 18MW.

6.7.8 CAPEX will decrease, the initial £42.77m is based on the weighted average construction cost being £1.32m per MW, therefore the removal of 4 turbines at 3.6MW each, will reduce this by £19.00m to £23.76m. This may reduce contract opportunities during construction activities and throughout the supply chain.

6.7.9 The CAPEX is calculated in Table 6.2 below for the Revised Development, on a per MW estimation.

Table 6.2: Construction and Development Expenditure for Revised Development

	% of CAPEX	***Value, Original Scheme (£m)***	***Value, Revised development (£m)***
Development and Planning	10.2	4.36	2.43
Turbines	57.8	24.72	13.74
Balance of Plant	25.6	11	6.09
Grid Connection	6.3	2.69	1.50
Total	100.0	42.77	23.76

6.7.10 The EIA Report estimated that the Revised Development could potentially support an average of 30 staff on-site per day, during peak construction periods. The Revised Development will not result in a reduced number of staff on-site however, may result in a shorter construction period.

6.7.11 Despite the reduction in CAPEX from the EIA Report, the construction of the Revised Development is considered to have a short term, beneficial, direct and indirect effects to the area, through the increase of employment.

6.7.12 Overall, the Revised Development is not expected to result in any fundamental or long-term change to population, local services employment or overall structure of the community, but the effects will be of medium magnitude at the local level (of low sensitivity). This would not be significant under the EIA regulations.

Induced Effects

6.7.13 Induced effects will occur when the earnings of workers supplying services to the Revised Development are spent both locally and elsewhere in Scotland. For example, local shops, cafes, accommodation providers and hotels often experience an increase in turnover during the construction phase as they have opportunities to provide additional services to the Developer and their contractors.

6.7.14 The Revised Development will result in a reduced construction programme and in turn, reduced turnover during the construction phase as detailed in the EIA Report.

6.7.15 Overall, the construction of the Revised Development will bring short-term, beneficial, induced effects to the area, through the increase in employment. This will not result in any fundamental or long-term change to population, local services, employment or overall structure of the community, but effects will be of medium magnitude at the local level (of low sensitivity). This would not be significant under the EIA regulations.

Operational Effects

6.7.16 Due to the reduction in turbines within the Revised Development, the average operational cost of the Revised Development per annum will reduce as the MW installed is reduced.

6.7.17 The OPEX is estimated to reduce by £844,444 per annum as a result of the Revised Development, resulting in an OPEX of £1.06m per annum, based on the Renewables UK (2015) report detailed in the EIA Report. Despite this reduction, this will conclude in a positive, negligible effect, which would be not significant in terms of the EIA Regulations.

6.7.18 It is still considered that the Revised Development would lead to a positive, negligible effect on employment and business opportunities, and would not be significant in terms of the EIA Regulations.

Community Fund

6.7.19 The Applicant is proposing a community benefit package of £5,000 per MW per annum as noted in the EIA Report, to the Lochluichart Community Trust (LCT). Considering the Revised Development and reduced capacity (18MW), a community benefit contribution of £2.25m over the lifetime of the Revised Development is anticipated, equating to £90,000 per annum.

6.7.20 This constitutes a minor, positive effect, although this is not significant in terms of the EIA Regulations and not a planning consideration.

Decommissioning

6.7.21 Impacts on socio-economic impacts during decommissioning are anticipated to be similar to that of construction effects thereby representing short-term, positive effect acting at a local level due to increased employment.

6.8 Assessment of Potential Effects on Tourism and Recreation

6.8.1 The Revised Development is expected to have reduced indirect effects due to the reduction in number of turbines reducing visual effects on tourism and recreational resources.

Construction Effects

6.8.2 No change to effects based on the Revised Development.

Operational Effects

6.8.3 The Revised Development has removed four turbines that are visible from the A835, which is part of the popular tourist route North Coast 500 and the Right of Way HR46 which starts on the A835 at Loch Glascarnoch. It is anticipated that there will be a reduction in landscape and visual effects on the A835 due to reduced number of turbines and increased separation distance. The Revised Revised would be of a scale more closely comparable with the turbines of the Operational Wind Farms and this would increase the sense of unity and their perceived integration with the operational turbines.

6.8.4 These effects are anticipated to remain not significant due to negligible magnitude of the impact.

Public Attitudes to Wind Farms

6.8.5 No change to effects based on the Revised Development.

Decommissioning

6.8.6 Direct effects on tourism and recreation are anticipated to be similar to that of construction effects, thereby remaining not significant.

6.9 Assessment of Potential Effects on Land-Use

6.9.1 The Revised Development will cover a reduced area and infrastructure footprint due to removal of turbine foundations and associated tracks.

Construction Effects

6.9.2 Construction effects on land-use are expected to remain unchanged from the Revised Development; they will be limited and temporary in nature, the magnitude of effects are considered low and therefore not significant in terms of EIA Regulations.

Operational Effects

6.9.3 The Revised Development will result in a reduced overall land-take and therefore the effects are expected to be of lower magnitude that the initial Revised Development; the effects will not have a significant effect on the land-use receptors in accordance with the EIA Regulations.

Decommissioning

6.9.4 The effects on land-use of the Revised Development during the decommissioning phase is expected to be similar to that during construction, with a temporary cessation of agricultural activities in the vicinity of the Revised Development while turbine removal is undertaken. This effect will be short-term and of negligible significance, which is considered to be not significant in terms of EIA Regulations.

6.10 Assessment of Cumulative Effects

6.10.1 No change to cumulative effects based on Revised Development.

6.11 Mitigation Measures and Residual Effects

6.11.1 No mitigation measures were proposed regarding socio-economics, tourism and recreation in the EIA Report and mitigation is considered unnecessary due to the changes associated with the Revised Development.

6.12 Summary

6.12.1 The total CAPEX cost of the Revised Development is expected to be £23.76m.

6.12.2 The OPEX is expected to be £1.06m per annum, of which £452,594 is estimated to be spent in the local area.

6.12.3 Overall, the construction of the Revised Development is expected to create both direction and indirect short-term benefits to the local area through construction activities, and supply chain opportunities. In the long term this will not result in any fundamental change in population, local services, employment or overall structure of the local economy.

6.12.4 The Revised Development will result in less visual effects on surrounding recreational receptors (for example, the Right of Way HR46), and therefore will have a reduced effect on recreational amenity.

6.12.5 No significant socio-economic, tourism and recreation, and land-use effects are anticipated as a result of the Revised Development.

References

BiGGAR Economics (2016) Wind Farms and Tourism Trends in Scotland [Online] Available at: http://www.biggareconomics.co.uk/wp-content/uploads/2016/07/Research-Report-on-Wind-Farms-and-Tourism -in-Scotland-July-16.pdf (Accessed 30/07/19)

7. Traffic and Transport

7.1 Non-Technical Summary

7.1.1 An assessment of the effect of the Revised Development on Traffic and Transport has been undertaken.

7.1.2 The majority of construction vehicles are anticipated to approach the Development from the south, via the A9 and A835. The route for Abnormal Load Vehicles, which will be used for the delivery of wind turbine components, is from the Port of Invergordon via the A9, Cromarty Bridge and A835.

7.1.3 During construction, overall traffic flow levels and levels of HGV flow can be expected to increase on routes approaching the Revised Development. The peak month for traffic flow is expected to be month eight of construction. During month eight overall traffic flow is expected to increase by 2.5% and Heavy Goods Vehicle (HGV) flow by 4.3% on the A835 within the vicinity of the Revised Development, this represents the highest predicted percentage increase on any route in the assessment. The predicted increase in traffic flow on all routes in the assessment is therefore negligible in terms of the EIA Regulations.

7.1.4 As the predicted increase in traffic flow during construction is low and temporary, no significant effects on traffic and transport are expected to occur as a result of the Revised Development.

7.1.5 Traffic associated with operation of the Revised Development is predicted to be minimal or, amounting to an average of three vans per day. The effect of operational traffic is therefore not significant in terms of the EIA Regulations.

7.2 Introduction

7.2.1 This chapter address the potential effects of the 5-turbine Lochluichart Wind Farm Extension II (see Chapter 3 for further information, and hereafter known as 'the Revised Development') has on Traffic and Transport. It supplements Chapter 7: Traffic and Transport of the 2019 Environmental Impact Assessment Report (hereafter known 'EIA Report') which supported the application for the 9-turbine Lochluichart Wind Farm Extension II (hereafter referred to as 'the Original Scheme'), and should be read in conjunction with it.

7.2.2 The EIA Report assessed the anticipated increase in road traffic arising from construction, operation and decommissioning of the Original Scheme. This assessment concluded that the increase in traffic would be at a maximum during construction, but that the percentage increase in traffic above baseline levels would be low and below the threshold of significance at all locations within the study. Therefore, no significant effects on Traffic and Transport were predicted to occur.

7.2.3 The methodology of the EIA Report remain valid and appropriate and therefore have not been revisited for the purpose of this Supplementary Information (SI), unless otherwise stated.

7.3 Legislation, Policy and Guidance

7.3.1 No changes to legislation, policy and guidance are noted from the EIA Report.

7.4 Assessment Methodology and significance Criteria

7.4.1 No changes to the assessment methodology and significance criteria from the EIA Report are proposed.

7.5 Responses and Consultation

7.5.1 In their consultation response to the EIA Report the Highland Council (THC) stated that whilst the proposed delivery route from the Port of Cromarty Firth at Invergordon had been used previously for the Lochluichart Wind Farm and Lochluichart Wind Farm Extension (hereafter known as 'the Operational

Schemes'), the use of larger turbines may require the route to be reassessed, particularly with regard to the effect on any structures.

7.6 Baseline Conditions

Access Routes

7.6.1 No changes to the access route for Abnormal Load Vehicles (ALVs) or general construction traffic are proposed as a result of the Revised Development.

Qualitative Assessment of Existing Roads

7.6.2 No changes to existing roads have been identified since the submission of the EIA Report.

Baseline Traffic Flow Data

7.6.3 Up to date baseline traffic flow information was collected from the Department for Transport (DfT) traffic count database. The most recent available data was used, which is from 2018. The EIA Report used data collected from 2016.

7.6.4 The traffic growth factor was updated from the EIA Report to reflect the more recent date of baseline data. A growth factor of 1.038 was applied to all traffic flow data to forecast flow in the anticipated year of construction 2021. The methodology for calculating the traffic growth factor is unchanged from the EIA Report.

Table 7.1: Baseline AADT and Factored AADT

			2018 Baseline AADT		**2021 Factored AADT**	
	Road	**Location**	**All Vehicles**	**HGVs**	**All Vehicles**	**HGVs**
1	A835	Aultguish Inn	1721	162	1786	168
2	A835	Tarvie	4050	238	4203	247
3	A835	West of A832	4196	384	4355	399
4	A835	East of A832	4682	258	4859	268
5	A835	West of Tore Roundabout	12044	361	12500	375
6	A9	North of Tore Roundabout	11791	968	12238	1005
7	A9	North of Cromarty Bridge	15727	1007	16323	1045
8	A9	West of B817	11848	709	12297	736
9	A9	South of Tore Roundabout	26659	1319	27669	1369

7.6.5 Typical road capacity has not changed since the EIA Report and therefore no update to the estimated capacity will be provided.

Road Traffic Collision Assessment

7.6.6 An updated Road Traffic Collision (RTC) Assessment was undertaken. This identified all 'serious' and 'fatal' RTCs within the last five years (2014-2018)

on routes within the study area was undertaken, in this case the A835 from, and including, Tore Roundabout to the Site entrance was considered.

7.6.7 'Serious' RTCs are defined as those which result in hospitalisation of one or more of the parties involved. 'Fatal' RTCs are defined as those in which one or more parties' dies within 30 days as a result of injuries

7.6.8 Four 'Serious' RTCs, and three 'Fatal' RTCs were identified, at the locations indicated on Figure 7.1. No trends or clusters of RTCs were identified within the data.

Sensitive Receptors

7.6.9 No changes to sensitive receptors were identified from the EIA Report and therefore an updated sensitive receptor baseline assessment is not provided.

7.7 Assessment of Potential Effects

7.7.1 An updated assessment of construction development traffic has been undertaken to reflect the reduction in number of turbines and associated reduction in on-site tracks.

7.7.2 A detailed programme of anticipated construction development traffic is provided in Table 7.10: Anticipated Vehicle Movements. The following subsections provide detail for each element of work. A summary is provided at the end of this section.

Site Mobilisation and Demobilisation

7.7.3 HGV and other vehicle movements will be required during site mobilisation. This will comprise the erection of welfare facilities, delivery of construction site vehicles and importation of plant and equipment, including equipment for processing material from the on-site borrow pits and for concrete batching. The majority of these movements will be as HGVs and low loaders which will deliver and then depart the site empty.

7.7.4 During site demobilisation, the majority of this equipment will be removed from Site. Vehicle movements for demobilisation will result from empty HGVs and low loaders travelling to Site and then departing loaded. Table 7.2 indicates the anticipated number of vehicle movements associated with site mobilisation and demobilisation.

Table 7.2: Anticipated Vehicle Movements – Site Mobilisation/Demobilisation

Operation	*Vehicle Type*	*Operational Months*	*Total*	*Max Monthly*
On-site vehicles	Car/LGV**	1, 14	16	8
Construction Compound	HGV Low Loader	1, 14	50*	25*
Borrow Pit and Concrete Batching Equipment	HGV Low Loader	2, 14	54*	27*
Overall			**120**	**60**

*Includes transporter vehicle leaving and then returning to site during demobilisation

**Self-propelled vehicles which arrive in one month and depart in another

Access Track and Hardstanding Construction

7.7.5 All stone required for construction of the access tracks and hardstandings is expected to be sourced from on-site borrow pits and processed on Site. Therefore, there are not anticipated to be any vehicle movements associated with/ the importation of stone for access track construction.

7.7.6 One team is expected to operate during access track construction and is expected to utilise an excavator, roller and four dumper trucks. It is assumed that the excavator and rollers will be delivered to the Site via low loaders at the commencement of this operation and will generate two vehicle trips for delivery and another two trips during removal for each vehicle, the dumper trucks will be self-propelled to and from the Site.

7.7.7 Other materials will require to be imported regularly throughout construction of the access tracks such as geo-membrane, drainage pipes and culvert sections.

7.7.8 Table 7.3 indicates the anticipated number of vehicle movements associated with access track and hardstanding construction.

Table 7.3: Anticipated Vehicle Movements - Access Track and Hardstanding Construction

Operation	*Vehicle Type*	*Operational Months*	*Total*	*Max Monthly*
Plant Delivery	HGV Dump Truck**	3,7	8	4
	HGV Low Loader (Excavator/Rollers)	3,7	8*	4*
Material Deliveries	HGV	3-7	24	5
Overall			**40**	**13**

*Includes transporter vehicle leaving and then returning to site during demobilisation
**Self-propelled vehicles which arrive in one month and depart in another

Turbine Foundation Construction

7.7.9 It is anticipated that concrete for each of the turbine foundations will be batched on-site. It is possible that aggregate for this concrete will be won from the on-site borrow pits, however this is subject to the quality and quantity of rock available.

7.7.10 In order to provide a robust assessment, and to account for the worst-case scenario, it has been assumed that all aggregate for turbine foundations will be imported to the Site. This estimate therefore represents a conservative assessment, and the actual number of vehicles associated with turbine foundations is likely to be significantly lower.

7.7.11 Each foundation will require approximately 30 HGV loads of sand and aggregate, 7 HGV loads of cement and 3 HGV loads of steel reinforcement

(rebar). For 5 turbines, this will result in a total of 150 HGV loads of sand, 35 HGV loads of cement and 15 HGV loads of steel reinforcement.

7.7.12 This will result in a total of 300 vehicle movements for sand and aggregate, 70 vehicle movements for cement and 30 vehicle movements for rebar over the three-month course of this phase of works. Table 7.4 details the expected vehicle movements associated with turbine foundation construction.

Table 7.4: Anticipated Vehicle Movements - Turbine Foundation Construction

Operation	*Vehicle Type*	*Operational Months*	*Total*	*Max Monthly*
Sand & Aggregate	HGV Dump Truck	6-8	300	100
Cement	HGV	6-8	70	24
Rebar	HGV Low Loader	6-8	30	10
Overall			**400**	**134**

Control Building and Substation Construction

7.7.13 Material for construction of the substation compound is assumed to be won from on-site borrow pits, however concrete and other building materials will require to be imported to construct the control building. This is anticipated to require 50 HGV loads, resulting in a total of 100 vehicle movements, over the seven-month duration of this phase of works.

7.7.14 Electrical components, switchgear and cabling will require importing and is predicted to result in 20 HGV loads, totalling 40 movements.

7.7.15 Table 7.5 indicates the anticipated vehicle movements associated with control building and substation construction.

Table 7.5: Anticipated Vehicle Movements - Substation Construction

Operation	*Vehicle Type*	*Operational Months*	*Total*	*Max Monthly*
Control Building Materials	HGV	2-8	100	15
Electrical Components	HGV	2-8	40	6
Overall			**140**	**21**

Crane Delivery

7.7.16 A large crawler or track mounted crane of approximately 1,000 tonne capacity will be required for turbine erection along with an additional 160 tonne pilot crane. The crawler crane will be transported in component form and assembled on-site, this will require approximately 52 HGV movements to be undertaken prior to the commencement of turbine delivery. The pilot crane will be self-propelled although will constitute an abnormal load vehicle due to its weight.

7.7.17 Both cranes will remain on site for the duration of the turbine assembly phase. Table 7.6 indicates the number of vehicle movements associated with crane delivery.

Table 7.6: Anticipated Vehicle Movements - Crane Delivery

Operation	*Vehicle Type*	*Operational Months*	*Total*	*Max Monthly*
Crawler Crane	HGV	7, 10	52	26
	Abnormal Load Vehicle**	7, 10	2	1
Overall			**54**	**27**

**Self-propelled vehicles which arrive in one month and depart in another

Turbine Delivery

7.7.18 Turbines will be delivered as separate components the majority of which will require to be transported by abnormal load vehicle (ALV). Each turbine will require 11 abnormal load deliveries, resulting in a total of 110 vehicle movements over the two-month phase of turbine delivery.

7.7.19 Following delivery of components, the ALVs are able to retract to the size of a standard HGV vehicle for the return journey.

7.7.20 Two escort vehicles are likely to be required to accompany each ALV which will result in a worst case of 220 additional vehicle movements. In practice, this figure may be reduced where abnormal load vehicles approach the site in convoy and fewer than two escort vehicles per abnormal load are required.

7.7.21 Table 7.7 indicates the anticipated vehicle movements associated with Turbine Delivery.

Table 7.7: Anticipated Vehicle Movements - Turbine Delivery

Operation	*Vehicle Type*	*Operational Months*	*Total*	*Max Monthly*
Turbine Components	ALV	8-9	110	55
	Escort Car or Van	8-9	220	110
Overall			**330**	**165**

Fuel Delivery

7.7.22 Fuel will require regular delivery to the Site regularly throughout the construction period and is expected to total 1 HGV fuel tanker delivery per month, totalling 20 vehicle movements over the duration of construction. Table 7.8 indicates the number of vehicle movements associated with fuel delivery.

Table 7.8: Anticipated Vehicle Movements Fuel Delivery

Operation	*Vehicle Type*	*Operational Months*	*Total*	*Max Monthly*
Fuel Delivery	HGV Fuel Tanker	1-10	20	1

Construction Personnel and Staff

7.7.23 It is anticipated that an average of 30 staff will be required onsite per day throughout construction and commissioning, months 1-14. For the purposes of this assessment, the most recent available Scottish private vehicle occupancy rate of 1.57 people per vehicle was used.

7.7.24 Assuming a 26-day working month, this is expected to result in a total of 13,910 vehicle trips for staff over the course of construction of the Revised Development. Table 7.9 indicates the number of vehicle movements associated with staff.

Table 7.9: Anticipated Vehicle Movements - Staff

Operation	*Vehicle Type*	*Operational Months*	*Total*	*Max Monthly*
Staff	Car or Minibus	1-14	13,910	994

Summary

7.7.25 Table 7.10 provides a summary of all deliveries expected throughout duration of construction.

Table 7.10: Anticipated Vehicle Movements - Summary

Operation	*Vehicle Type*	*Operational Months*	*Total*	*Max Monthly*
Site Mobilisation/Demobilisation				
On-site vehicles	Car/LGV**	1, 14	16	8
Construction Compound	HGV Low Loader	1, 14	50*	25*
Borrow Pit and Concrete Batching Equipment	HGV Low Loader	2, 14	54*	27*
Subtotal			**120**	**60**
Access Track and Hardstanding Construction				
Plant Delivery	HGV Dump Truck**	3,7	8	4
	HGV Low Loader (Excavator/Rollers)	3,7	8*	4*
Material Deliveries	HGV	3-7	24	5

Operation	*Vehicle Type*	*Operational Months*	*Total*	*Max Monthly*
Subtotal			**40**	**13**
Turbine Foundation Construction				
Sand & Aggregate	HGV Dump Truck	6-8	300	100
Cement	HGV	6-8	70	24
Rebar	HGV Low Loader	6-8	30	10
Subtotal			**400**	**134**
Substation Construction				
Control Building Materials	HGV	2-8	100	15
Electrical Components	HGV	2-8	40	6
Subtotal			**140**	**21**
Crane Delivery				
Crawler Crane	HGV	7, 10	52	26
	Abnormal Load Vehicle**	7, 10	2	1
Subtotal			**54**	**27**
Turbine Delivery				
Turbine Components	ALV	8-9	110	55
	Escort Car or Van	8-9	220	110
Subtotal			**330**	**165**
Fuel Delivery				
Fuel Delivery	HGV Fuel Tanker	1-10	**20**	**1**
Staff				
Staff	Car or Minibus	1-14	**13,910**	**994**
Total				
Total HGV and Abnormal Load Movements			868	210
Total Car and Van Movements			14,146	994
Overall Total			**15,014**	**1314**

*Includes transporter vehicle leaving and then returning to site during demobilisation
**Self-propelled vehicles which arrive in one month and depart in another

7.8 Assessment of Cumulative Effects

Traffic Generation

7.8.1 A detailed breakdown of the distribution of vehicle movements in each month, and for each element of work, throughout the construction phase of the Revised Development is included in Table 7.10: Anticipated Vehicle Movements. The peak month of construction, from a traffic perspective, was identified and used to predict the traffic increase on routes within the study area. A worst-case scenario in which all predicted traffic passes each location within the study was assumed.

7.8.2 From inspection of the predicted traffic movements, the peak month for vehicle flow is expected to be month 8 where a total of 1314 vehicle movements are predicted. This will result in an average of 51 vehicle movements per day, assuming a 26-day working month.

7.8.3 Table 7.11 details the anticipated vehicle flow in the peak month and the percentage increase above the predicted baseline at each point within the study.

Table 7.11: Predicted Peak Month Average Daily Traffic

Location	*Total Vehicles*			*HGV Only**		
	2021 Baseline	*Peak Month*	*% Increase*	*2021 Baseline*	*Peak Month*	*% Increase*
1	1786	1837	2.8	168	176	4.8
2	4203	4254	1.2	247	255	3.3
3	4355	4406	1.2	399	407	2.0
4	4859	4910	1.0	268	276	3.0
5	12500	12551	0.4	375	383	2.2
6	12238	12288	0.4	1005	1013	0.8
7	16323	16374	0.3	1045	1053	0.8
8	12297	12348	0.4	736	744	1.1
9	27669	27720	0.2	1369	1377	0.6

*For the purposes of this estimation abnormal load vehicles are included in HGV

7.8.4 A screening exercise was undertaken in order to determine which routes warrant detailed assessment. The lower threshold of significance (10%) was considered appropriate for routes located near to the identified highly sensitive receptor of Tore Primary School, reference points 5 and 9. Considering the increase in overall traffic, and HGV traffic, detailed in Table 7.11 at reference locations 5 and 9 it can be seen that the lower (10%) threshold of significance has not been exceeded.

7.8.5 The upper (30%) threshold of significance was considered appropriate for all other routes within the study. Considering the increase in overall traffic, and HGV traffic, detailed in Table 7.11 it can be seen that this threshold has not been exceeded on any route within the study.

7.8.6 It is therefore considered that in all cases the effect of traffic generation on routes within the study is negligible and not significant in terms of the EIA Regulations.

7.8.7 As the predicted increase in traffic at all locations within the study is below the threshold of significance no significant effects are predicted to occur. This is consistent with the findings of the EIA Report.

Operational Effects

7.8.8 No material changes to the anticipated operational traffic from the EIA Report are predicted.

Decommissioning Effects

7.8.9 Traffic and transport effects associated with decommissioning of the Revised Development are expected to comprise removal of the turbines and all associated above ground equipment. Turbine towers and blades are likely to be dismantled into smaller sections prior to their removal to ease transport requirements.

7.8.10 At this stage, it is not possible to forecast quantitatively or accurately the traffic effect during decommissioning of the Revised Development as the baseline data would no longer be valid. It is reasonable to assume that baseline traffic would continue to increase. The implication of applying further background traffic growth would be that the proportional impact of the decommissioning traffic would reduce in comparison to the construction traffic impact that has been assessed.

7.8.11 The decommissioning effects would also be greatly reduced as the majority of the construction traffic is created by the import of concrete for turbine foundations, which is likely be left in situ at depth of greater than 1 m below ground level.

7.8.12 Prior to decommissioning of the Revised Development, a traffic assessment would be undertaken and appropriate traffic management procedures agreed with the relevant authorities at the time.

Cumulative Assessment

7.8.13 No changes to cumulative effects from the EIA Report were identified.

7.9 Summary

7.9.1 An updated Traffic and Transport Assessment, including updated baseline traffic assessment, has been undertaken for the Revised Development.

7.9.2 The predicted increase in traffic occurring as a result of the Revised Development is below the threshold of significance as defined in the IEMA Guidelines in all cases.

7.9.3 Therefore, all effects relating to traffic are predicted to be low and not significant in terms of the EIA Regulations. This assessment is consistent with the conclusions of the EIA Report.

References

The Scottish Government (2011) High Level Summary of Statistics Trend, Car Occupancy [Online] Available at: http://www.gov.scot/Topics/Statistics/Browse/Transport-Travel/TrendCarOccupancy (Accessed 01/08/19)

8. Noise

Non-Technical Summary

8.1.1 An assessment of the effects of noise due to the Revised Development has been undertaken. The assessment takes into account changes to the design of the Original Scheme since preparation of the EIA Report and consultation undertaken with the Environment Health Department of The Highland Council (THC).

8.1.2 During construction, noise may result from the use of plant and machinery to carry out construction activities. Due to the substantial separation distance between the Revised Development and nearby residential dwellings, no significant effects are anticipated. Notwithstanding this, Best Practice mitigation measures will be adopted to manage noise emissions, including restrictions on working hours during the construction of the Revised Development.

8.1.3 During operation, wind turbines can generate noise from the machinery housed within the turbine and from the movement of blades through the air. Modern turbines are designed to minimise noise and planning conditions are used to ensure compliance with specified noise limits.

8.1.4 The assessment has been undertaken in accordance with the recommendations of ETSU R-97, the method of assessing wind turbine noise recommended by Government guidance, and following the current best practice methods described in the Institute of Acoustics' *A Good Practice Guide to the Assessment and Rating of Wind Turbine Noise* as endorsed by the Scottish Government. It has been shown that noise due to the Revised Development would comply with the requirements of both ETSU R-97 and THC at the closest, and therefore all receptor locations.

8.1.5 As agreed with THC, a cumulative assessment has also been undertaken in conjunction with the adjacent Lochluichart, Lochluichart Extension and Corriemoillie Wind Farms. Worst-case operational noise levels are below the identified noise limits, and the impact of operational noise has therefore been demonstrated as acceptable.

8.1.6 Noise produced during decommissioning of the Revised Development is likely to be of a similar nature to that during construction, although the duration of decommissioning will be shorter than that of construction. Any legislation, guidance or best practice relevant at the time of decommissioning would be complied with.

8.2 Introduction

8.2.1 This chapter of the Supplementary Information (SI) addresses the potential effects of noise due to the of the 5-turbine Lochluichart Wind Farm Extension II (see Chapter 3 for further information, and hereafter known as 'the Revised Development'). It supplements Chapter 8: Noise of the 2019 Environmental Impact Assessment Report (hereafter known as the 'EIA Report'), which supported the application for the 9-turbine Lochluichart Wind Farm Extension II (hereafter referred to as 'the Original Scheme') and should be read in conjunction with it.

8.2.2 For the purposes of the SI, the candidate turbine remains the same as the EIA Report for the Original Scheme, the Senvion 3.6MW114 (3.6MW) was used as a reference wind turbine. It is noted that the turbine dimensions will vary depending on final turbine selected.

8.2.3 The methodology and findings of the EIA Report remain valid and appropriate and therefore have not been reassessed for this SI, unless otherwise stated.

8.2.4 SI Figures 8.1 and 8.2 present updates to the corresponding figures in the EIA Report.

8.2.5 The key conclusions of the EIA Report in relation to noise were:

- Application of good practice measures to manage construction noise, as described at Paragraph 8.93 of the EIA Report, will ensure that noise effects associated with the Revised Development are minimised as far as is reasonably practicable and that the construction process is operated in compliance with the relevant legislation;
- Levels of operational noise are predicted to be compliant with the requirements of ETSU-R-97 and THC based upon noise limits derived in accordance with ETSU-R-97 and the recommendations of the GPG;
- Noise levels at all noise-sensitive properties, due to operation of the Revised Development, would be acceptable in terms of the recommendations of both ETSU-R-97 and not significant in terms of the EIA Regulations; and Construction and Decommissioning noise will be limited in duration and confined to working hours as specified by THC and can therefore be adequately controlled through planning condition. The application of mitigation measures where applicable will also ensure that any noise from the Site will be adequately controlled and therefore, not significant in terms of the EIA Regulations.

8.3 Legislation, Policy and Guidance

8.3.1 There is no change to Legislation, Policy and Guidance relating to noise from that described in the EIA Report.

8.4 Assessment Methodology and significance Criteria

8.4.1 The assessment methodology applied in the EIA Report has been applied in this SI, with the following minor amendments:

- Following additional post-submission consultation with the Environmental Health Department (the EHD) of THC, the cumulative daytime fixed lower noise limit was reduced from 40 dB, $L_{A90,10min}$ to 38 dB, $L_{A90,10min}$; and

- It was agreed in consultation with the EHD that the safety margin applied to predicted noise levels for cumulative developments could be reduced from 3dB to 2dB. It should be noted that this safety margin is in addition to the 2dB allowance for measurement uncertainty which was applied to the turbines' noise emission data. Appendix 8.A of the SI presents the cumulative noise emission data applied to this assessment.

8.5 Responses and Consultation

8.5.1 As detailed above, consultation with the EHD has resulted in two minor amendments to the methodology applied. The EHD has not issued a formal response to the EIA Report.

8.6 Baseline Conditions

8.6.1 There is no change to baseline conditions reported in the EIA Report up to Paragraph 8.79.

8.6.2 Cumulative noise limits based upon a 38 dB L_{A90} cumulative lower daytime limit daytime have been recalculated from the background noise levels presented in Table 8.4 of the EIA Report. These revised cumulative noise limits for the Revised Development are presented in Table 8.1 of this Chapter. Night-time noise limits remain the same as those presented in the EIA Report, but have been reproduced in Table 8.1 in the interest of completeness.

Table 8.1: Cumulative Noise Limits, Aultguish Inn

Period	**Standardised 10 m Wind Speed, ms^{-1}**								
	4	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	Cumulative Noise Limit, dB, $L_{A90,10min}$								
Daytime	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.8	41.6
Nigh0t-time	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0

8.6.3 Table 8.2 of this Chapter details cumulative noise levels (excluding noise due to the Revised Development), calculated in accordance with the methodology presented in Paragraphs 8.56 and 8.57 of the EIA Report. As previously discussed, these levels include 2 dB allowance for uncertainty and 2 dB safety margin for each cumulative development (Lochluichart Wind Farm, Lochluichart Extension Wind Farm and Corriemoillie Wind Farm). Following discussions with the EHD, the cumulative scenario has not been updated since the EIA Report. Whilst is it not necessary for the purposes of this assessment, Table 8.2 shows the total predicted cumulative noise level in combination with the Revised Development, in the interest of completeness.

Table 8.2: Cumulative Noise Levels, Aultguish Inn

	Standardised 10 m Wind Speed, ms^{-1}								
	4	**5**	6	7	8	9	10	11	12
	Cumulative Noise Level, dB, $L_{A90,10min}$								
Excluding Revised	24.7	27.2	31.7	34.2	35.7	35.9	35.9	35.9	35.9

	Standardised 10 m Wind Speed, ms^{-1}								
	4	**5**	6	7	8	9	10	11	12
	Cumulative Noise Level, dB, $L_{A90,10min}$								
Development									
Including Revised Development	26.7	29.6	33.4	35.4	36.5	36.7	36.7	36.7	36.7

8.6.4 In order to determine apportioned noise limits applicable to the Revised Development in isolation, the cumulative wind turbine noise levels excluding the Revised Development (Table 8.2) have been logarithmically subtracted from the total ETSU-R-97 noise limits (Table 8.1). The apportioned limits have then been corrected to ensure they are no greater than limits based upon the 35 dB $L_{A90,10min}$, daytime and 38 dB $L_{A90,10min}$ night-time fixed lower limits, as described in Paragraphs 8.68 to 8.71 of the EIA Report. As a conservative approach, a further adjustment has then been made to ensure that limits applied at low wind speeds are no greater than those applied at higher wind speeds. This is applicable at daytime wind speeds of 4 to 8 ms^{-1}.

8.6.5 The resulting apportioned limits applicable to the Revised Development are presented in Table 8.3. As previously noted, night-time noise limits remain the same as those presented in the EIA Report, but have been reproduced here for clarity.

Table 8.3: Apportioned Noise Limits applicable to the Revised Development in Isolation, Aultguish Inn

Period	**Standardised 10 m Wind Speed, ms^{-1}**								
	4	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	Noise Limit, dB, $L_{A90,10min}$								
Daytime	33.8	33.8	33.8	33.8	33.8	33.8	33.8	35.7	40.2
Night-time	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0

8.7 Assessment of Potential Effects

8.7.1 Table 8.4 details the predicted noise immission levels due to the Revised Development.

Table 8.4: Predicted Noise Levels due to the Revised Development

Receptor	**Standardised Wind Speed at 10 m AGL, ms^{-1}**								
	4	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	Predicted Noise Level, dB, $L_{A90,10min}$								
Aultguish Inn	22.5	25.8	28.7	29.1	29.1	29.1	29.1	29.1	29.1

8.7.2 Table 8.5 details the difference (margin) between the predicted noise levels due to the Revised Development (Table 8.4) and the apportioned noise limits presented in Table 8.3. A negative margin indicates that the predicted noise level is below the noise limit.

Table 8.5: Margins between Predicted Noise Levels and Apportioned Noise Limits

Receptor	Standardised 10 m Wind Speed, ms^{-1}								
	4	5	6	7	8	9	10	11	12
	Margin, dB								
Daytime									
Aultguish Inn	-11.3	-8.0	-5.1	-4.7	-4.7	-4.7	-4.7	-6.6	-11.1
Night-time									
Aultguish Inn	-15.5	-12.2	-9.3	-8.9	-8.9	-8.9	-8.9	-8.9	-8.9

8.7.3 As can be seen from Table 8.4, following the methodology described above, the Revised Development is able to comply with the noise limits apportioned from a cumulative lower daytime limit of 38 dB L_{A90}, as requested by THC. As such, the noise limits presented in Table 8.4 may be presented as an appropriate planning condition for the Revised Development as an alternative to those in Table 8.7 of the EIA Report, if required.

8.8 Assessment of Cumulative Effects

8.8.1 Cumulative effects have been taken into consideration in the assessment presented above.

8.9 Mitigation Measures and Residual Effects

Construction Noise

8.9.1 There is no change to the construction noise mitigation and residual effects presented in the EIA Report.

Operational Noise

8.9.2 There is no change to the operational noise mitigation and residual effects presented in the EIA Report.

8.10 Summary

8.10.1 An assessment of potential noise effects has been carried out for the operational, construction and decommissioning stages of the Revised Development. The assessment takes into account changes to the design of the Revised Development since preparation of the EIA Report and the post-submission consultation undertaken with the EHD of THC.

8.10.2 The assessment has been undertaken in accordance with the recommendations of ETSU R-97, the method of assessing wind turbine noise recommended by Government guidance, and following the current best practice methods described in the GPG, as endorsed by the Scottish

Government. It has been shown that noise due to the Revised Development would comply with the requirements of both ETSU-R-97 and THC at the closest, and therefore all receptor locations.

8.10.3 It is therefore concluded that noise levels at all noise-sensitive properties, due to operation of the Revised Development, would be acceptable in terms of the recommendations of both ETSU-R-97, THC and therefore, not significant in terms of the EIA Regulations.

8.10.4 Construction noise will be limited in duration and confined to working hours as specified by THC and can therefore be adequately controlled through planning condition should consent be granted. The application of mitigation measures where applicable will also ensure that any noise from the Revised Development will be adequately controlled.

8.10.5 Noise during decommissioning will be of a similar nature to that during construction and will be managed through best practice or other guidance or legislation relevant at the time.

References

ETSU for the DTI (2006). ETSU-R-97: The Assessment and Rating of Noise from Wind Farms

Institute of Acoustics (2013) A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind turbine Noise

9. Landscape and Visual Impact Assessment

Introduction

9.1.1 This chapter of the Supplementary Information (SI) has been prepared by Optimised Environments Limited (OPEN), who produced the Landscape and Visual Impact Assessment (LVIA) in the 2019 Environmental Impact Assessment Report (hereafter referred to as the 'EIA Report') for the 9 turbine Lochluichart Wind Farm Extension II, submitted in April 2019 (hereafter referred to as the 'Original Scheme').

9.1.2 The purpose of this chapter is to identify the changes to the landscape and visual resource that would arise as a consequence of the amendments made to the Lochluichart Wind Farm Extension II application (the amended 5 turbine scheme, hereafter referred to as 'the Revised Development'), as described in Chapter 3 of this SI. The changes to the layout, involving the removal of four wind turbines (T2, T3, T9 and T10) and associated infrastructure, has the potential to affect the reported landscape and visual effects due to the removal of a part of the Revised Development.

9.1.3 Specifically, this chapter updates the findings of Chapter 9 of the EIA Report for the Original Scheme and provides an updated assessment of the likely cumulative effects that would arise, given changes to the cumulative context since the Original Scheme was submitted.

9.1.4 This chapter should be read in conjunction with the revised plan and wireline graphics showing the Revised Development that are contained in SI Volume 2. The chapter updates the findings of the previous LVIA but should be read in conjunction with the baseline information that is set out in the EIA Report Chapter 9, that is not repeated here. Furthermore, the wirelines showing the Revised Development should be viewed in conjunction with the full suite of visualisations contained in Volume 3 of the EIA Report, including baseline photographs.

9.1.5 The following reading guide is provided to help orientate the reader to respective sections of assessment within the EIA Report:

Table 9.1: Reading Guide

Topic	Location within EIA Report Chapter 9	Location within SI Chapter 9
Relevant Consultation Responses	Table 9.1	Table 9.2
Methodology	Appendix 9.A	Not repeated
Baseline Information	Section 9.4	Paragraph 9.3.1 (essentially not repeated)
Survey of Landscape Character	From paragraph 9.4.10	Not repeated
Cumulative Wind Energy Development	Table 9.4	Not repeated
Layout Design	Section 9.5	Chapter 3 of the SI
Assessment of Physical Effects	From paragraph 9.7.1	From paragraph 9.3.2
Assessment of Effects on Landscape Character and Wild Land Assessment	From paragraph 9.7.16	From paragraph 9.3.4
Assessment of Effects on Views	From paragraph 9.8.1	From paragraph 9.3.9
Assessment of Cumulative effects	From paragraph 9.627	Section 9.4
LVIA GIS Figures	Volume 3	SI Volume 2
LVIA SNH Visualisations	Volume 3	SI Volume 2
LVIA THC Visualisations	Volume 3	SI Volume 2

9.1.6 In summary, this chapter presents updated information on the following matters:

- SNH consultation response received since the Original Scheme was submitted;

- Changes to the identified landscape and visual effects of the Revised Development, as a result of the amendments to the turbine layout;

- Updated cumulative assessment findings, as a consequence of changes to the cumulative context since the Original Scheme was submitted.

9.2 Relevant Consultation Responses

9.2.1 Following submission of the 2019 Planning Application to the Highland Council, the following consultation response was received from SNH, as set out in Table 9.2, with responses made by landscape consultants acting on behalf of the Applicant.

Table 9.2 Relevant Consultation Responses Received Following Submission

Consultee	Summary of Consultation Response	Response from Applicant
SNH 10/05/2019	***Visual Amenity from the A835*** *The proposal would introduce visibility of turbines along a stretch of the A835 which is largely unaffected by existing wind farms. This visibility would particularly affect road users travelling east, where the proposed turbines would draw the eye and detract from views to Ben Wyvis which forms a key landscape feature along this part of the route. The A835 is an important tourist route, linking Inverness to Ullapool and the scenic west coast with this part of the route specifically identified as a key gateway to the west coast in The Highland Council's Strategic Framework.* *Visual impacts along this section of the A835 have previously been minimised through mitigation and the design of the existing wind farms which has kept turbines well back from the road. The proposed application would overturn the mitigation put in place at these previous wind farms. We advise that the design integrity of the existing wind farms are maintained and the proposed turbines are relocated further back from the road.*	In direct response to comments made by SNH regarding the influence of the closer range turbines to the A835 and their effect on previously established mitigation measures, the four closest turbines have been removed. This will notably reduce the influence of the Revised Development on the experience of road-users. It will ensure the proposed turbines are well recessed in views of Ben Wyvis for east-bound road-users. The comparative ZTV in Amended Figure 9.34 shows the reduced extent to which the Revised Development would be visible from the A835 compared to the Original Scheme, with a section of visibility removed to the north-west of Aultguish Dam, from where more expansive views of Ben Wyvis are experienced.
SNH 10/05/2019	***Views from popular mountain summits*** *The Revised Development is surrounded by both nationally and regionally important landscapes. Views from elevated locations are largely restricted to mountain summits, the majority of which lie within Wild Land Areas, where the proposed developed will appear as an extension to the existing wind farms in the area. When seen from Ben Wyvis, one of the country's most popular mountains due in part to its accessibility, and Beinn a' Chasteil the proposed turbines do not to fit neatly with the existing wind farms and result in the cluster appearing to sprawl to the north. This has the effect of eroding the design integrity of the existing wind farms by not matching the density and spread of their layout. The proposed layout could be improved by better matching the existing wind farms in terms of density.* *Our siting and design guidance1 advises that wind farm extensions "Design objectives and principles should echo those*	The removal of the four most northerly turbines has an apparent benefit in views from Ben Wyvis, which owing to its location to the east, means that the expansion to the north is not readily evident and the extent of the Revised Development appears compact and well-integrated with Lochluichart and Corriemoillie wind farms (hereafter known as 'the Operational Wind Farms'). In the view from Beinn a' Chaisteil, the reduced number of turbines gives rise to a slightly lower density which better matches the existing density. The Revised Development comprises five turbines which fit neatly onto the northern edge of the Operational Wind Farms with a limited increase in the horizontal extents as experienced from some of the key mountain summits.

Consultee	Summary of Consultation Response	Response from Applicant
	of the original wind farm. Extensions should use turbines which are compatible with those in the existing wind farm, including aspects of scale, form, colour, and rotation speed. Generally, the design rationale of the original wind farm development should not be eroded."	
SNH 10/05/2019	*The likely landscape and visual impacts of the proposal could be mitigated by improvements to the design of the wind farm.*	The design of the Revised Development has been changed to accommodate concerns regarding the proximity of the proposed turbines to the A835, by removing four of the nine turbines.

9.3 Updated Assessment of Landscape and Visual Effects

Baseline Changes

9.3.1 Aside from changes to the relevant cumulative context that are assessed in section of 9.4 of this chapter, no other material changes have occurred to the baseline conditions on or around the site for the Revised Development, such that the baseline conditions described in the LVIA require to be updated.

Updated Assessment of Physical Effects

9.3.2 The LVIA for the Original Scheme assesses the likely physical effects from paragraph 9.7.1 to 9.7.15 of the EIA Report. Two landscape elements are assessed, Heather Moorland and Coniferous Woodland Plantation and the effect of the Original Scheme on these landscape elements is assessed to be not significant. This is because the majority of the heather moorland and coniferous woodland plantation will be retained and managed, with relatively small areas removed to accommodate the turbines and tracks.

9.3.3 As the Revised Development involves the removal of four turbines and associated access tracks/crane pads it follows that the physical effects of the Revised Development on the Heather Moorland and Coniferous Woodland Plantation will be of a lower magnitude when compared with the larger, Original Scheme. It also follows that the effects will remain not significant. The reduction in the development footprint, as a result of the removal of the four turbines and infrastructure, will demand less moorland and forestry to be removed on the site and this will be a beneficial change in terms of physical effects.

Updated Assessment of Effects on Landscape Character and Wild Land

9.3.4 The LVIA for the Original Scheme assesses the likely effects on landscape character receptors, designated landscapes and Wild Land Areas from paragraph 9.7.16 to 9.7.150. Paragraphs 9.6.19 to 9.6.41 set out the scope of the LVIA in terms of those landscape character receptors, designated landscapes and Wild Land Areas considered relevant to the assessment. The assessment found no significant effects on any landscape character receptors, designated areas and Wild Land Areas during the operational phase and only

localised and short-term effects on parts of four landscape character receptors during the construction phase.

9.3.5 OPEN has reviewed the findings of the LVIA, in light of the Revised Development and considers that there will be no change to the assessment of no significant effects on landscape designations and Wild Land Areas during both the construction and operational phase, and no significant effects on landscape character receptors during the operational phase. The short term and localised significant effects assessed during the construction phase for the Original Scheme would also apply to the Revised Development.

9.3.6 The reduction in the application from nine wind turbines to five, means the Revised Development will occupy a smaller footprint which will be discernible from most locations. While this reduction in extent and perception of the Revised Development will reduce the magnitude of change during the construction and operational phases, the reduction will be insufficient to alter the ratings of magnitude of change or findings of significance in respect of the landscape character receptors assessed. As a result, no changes to any landscape character receptor, landscape designation or Wild Land Area assessments are identified in this Chapter of the SI and paragraphs 9.7.16 to 9.7.112 in the EIA Report remain valid.

9.3.7 EIA Report Table 9.8 is provided below (renumbered Table 9.3 for ease of reference).

Table 9.3: Summary of Effects of Original Scheme on Landscape Character Receptors and Wild Land Areas

Landscape Receptor	**Sensitivity**	**Magnitude of change (const.)**	**Significance of the effect (const.)**	**Magnitude of change (operation)**	**Significance of the effect (operation)**
Rounded Hills: Ben Wyvis LCU	medium to high	medium to low	not significant	medium to low	not significant
Rounded Hills: Lochluichart LCU	medium	medium to high in the north medium in the south	**significant**	medium in the north medium to low in the south	not significant
Rounded Hills: Inchbae LCU	medium	medium in the south medium to low in the north	**significant** in the south not significant in the north	medium to low in the south low in the north	not significant

Undulating Moorland: Aultguish LCU	medium	medium	**significant**	medium to low	not significant
Ben Wyvis SLA	medium to high	medium to low	not significant	medium to low	not significant
Rhiddoroch – Beinn Dearg – Ben Wyvis WLA	medium to high medium in the south-west	medium to low	not significant	medium to low	not significant

9.3.8 The particular characteristics and qualities of each receptor in Table 9.3 are described in detail in the individual assessments in the EIA Report, from paragraph 9.7.16.

Updated Assessment of Visual Effects

9.3.9 The LVIA for the Original Scheme assesses the likely effects on visual receptors from paragraph 9.8.5 to 9.8.173 in the EIA Report. The changes to the Revised Development that are described in SI Chapter 3 have the greatest potential to give rise to visual changes, as the removal of some turbines from the larger Original Scheme will reduce the magnitude and appearance of effects on some visual receptors more readily than it will mitigate the perception of landscape character effects.

9.3.10 To inform the updated assessment, the following additional figures have been produced and are included in Volume 2 to the SI;

- Comparative wirelines of the Original Scheme and Revised Development alongside a baseline photograph for all 12 representative viewpoints that were used in the EIA Report;
- Comparative photomontages to THC standards for the representative viewpoints 1: Aultguish Inn, 2: Black Bridge, 5: Ben Wyvis and 8: Beinn a Chaisteil, alongside viewpoint location plans;
- Comparative photomontages to SNH standards for the representative viewpoints 1: Aultguish Inn, 2: Black Bridge, 5: Ben Wyvis and 8: Beinn a Chaisteil, alongside viewpoint location plans;
- Comparative blade tip ZTV of the Original Scheme and Revised Development;
- Cumulative ZTV with Kirkan; and
- Comparative wirelines for the representative viewpoints illustrating a subsequent 24m movement of T4.

9.3.11 The comparative wirelines present 90-degree wirelines of the Original Scheme and Revised Development in order to highlight the changes arising from the removal of the four most northerly turbines. The wirelines for the Revised Development also include Kirkan Wind Farm to assist in the revised cumulative assessment.

9.3.12 The photomontages have been produced to the same THC and SNH Visualisation Standards as was followed in the EIA Report, illustrating a 65.5 degree field of view for the THC photomontages and 90 degree field of view for the SNH photomontages. This allows a direct comparison to be drawn between the Original Scheme and the Revised Development.

9.3.13 A comparative ZTV has been prepared to examine the difference in theoretical visibility between the Original Scheme and Revised Development (Amended Figure 9.34 in SI Volume 2). This highlights the reduction in the physical extent of ZTV shading as a consequence of the removal of Turbines T2, T3, T9 and T10. The most notable reductions occur in respect of the A835, over a close-range section at 2 to 3.5km from the nearest turbine and over a middle range section at 5 to 11km. While actual visibility of the Original Scheme over the middle range section would be limited anyway, the removal of actual visibility over the closer range section would reduce the overall effect of the Revised Development on the views of road-users on the A835.

9.3.14 The cumulative ZTV with Kirkan highlights the inter-visibility that would occur between the Revised Development and this new application. This is discussed in more detail in Section 9.4.

9.3.15 EIA Report Table 9.9 is provided below (renumbered Table 9.3 for ease of reference) with an additional column indicating whether re-assessment is required in light of the Revised Development. This preliminary analysis has been informed by the comparative wirelines illustrating the Original Scheme and Revised Development from each of the viewpoints. It has indicated that while the removal of the turbines would be fully or partly evident from the majority of the viewpoints, their removal would not alter the findings of the assessment based on the Original Scheme. This conclusion often relates to the greater separation distance of the viewpoint from the Revised Development, the location of the Revised Development to the rear of the Operational Wind Farms and/or the limited extent to which the removed turbines were visible in the Original Scheme. In respect of these viewpoints, while the removal of the turbines will alter the magnitude of change to some extent, this extent would be insufficient to alter the rating and therefore also the assessment of significance as assessed in the EIA Report.

Table 9.4: Summary of Visual Effects of Original Scheme on Visual Receptors

Viewpoint	Sensitivity	Magnitude of change (const.)	Significance of the effect (const.)	Magnitude of change (operation)	Significance of the effect (operation)	Effects of the Revised Development

1. A835 Aultguish Inn	medium – road-users medium / high - residents	medium to high	**significant** – road-users and residents	medium	**significant** - residents and road-users	**Re-assessment required**
2. A835 Black Bridge Road	medium	medium	**significant**	medium	**significant**	**Re-assessment required**
3. Garve Bridge	medium	low	not significant	low	not significant	No re-assessment required
4. Old Drover's Road, Corriemoillie	medium	medium	**significant**	medium to low	not significant	**Re-assessment required**
5. Ben Wyvis	medium to high	medium to low	not significant	medium to low	not significant	**Re-assessment required**
6. An Coileachan	medium to high	medium to low	not significant	low	not significant	No re-assessment required
7. Sgurr Mor	medium to high	medium to low	not significant	low	not significant	No re-assessment required
8. Beinn a Chaisteil	medium to high	medium to low	not significant	medium to low	not significant	No re-assessment required
9. Avenue of Fairburn Estate	medium	low	not significant	low	not significant	No re-assessment required
10. Sgurr a Mhuilinn	medium to high	low	not significant	low	not significant	No re-assessment required
11. Sgurr a Choire Ghlais	medium to high	low	not significant	low	not significant	No re-assessment required
12. Beinn Dearg	medium to high	medium to low	not significant	medium to low	not significant	No re-assessment required

9.3.16 An updated assessment for each of the five viewpoints which require re-assessment as a result of the Revised Development is presented below. An analysis of the comparative wirelines for each of the viewpoints has assisted in the assessment of the extent to which the magnitude of change would be altered by the Revised Development.

9.3.17 Table 9.5 below, presents the updated assessment of the SI magnitude of change and significance of visual effects. Where a finding in the EIA Report has been altered by the removal of one or more of the four turbines described in the SI, the updated assessment is also highlighted with grey shading.

Table 9.5: Summary of Updated Visual Effects of the Revised Development on Visual Receptors

Viewpoint	**Magnitude of change (const.)**	**Significance of the effect (const.)**	**Magnitude of change (operation)**	**Significance of the effect (operation)**
1. A835 Aultguish Inn	Original Scheme -medium to high. Revised Development – medium.	Original Scheme – **significant**.	Original Scheme -medium. Revised Development– medium to low.	Original Scheme – **significant**. Revised Development– not significant.
2. A835 Black Bridge Road	Original Scheme – medium. Revised Development– as above.	Original Scheme – **significant.** Revised Development– as above	Original Scheme -medium. Revised Development– medium to low.	Original Scheme – **significant**. Revised Development– not significant.
4. Old Drover's Road, Corriemoillie	Original Scheme – medium. Revised Development– as above.	Original Scheme – **significant.** Revised Development– as above.	Original Scheme -medium to low. Revised Development– as above.	Original Scheme - not significant. Revised Development– as above
5. Ben Wyvis	Original Scheme - medium to low. Revised Development– as above.	Original Scheme - not significant Revised Development– as above.	Original Scheme -medium to low. Revised Development– low.	Original Scheme - not significant. Revised Development– as above.
8. Beinn a Chaisteil	Original Scheme - medium to low. Revised Development– as above.	Original Scheme - not significant. Revised Development– as above.	Original Scheme -medium to low. Revised Development– as above.	Original Scheme - not significant. Revised Development– as above.

Viewpoint 1: Aultguish Inn

9.3.18 During construction, the magnitude of change relating to the Revised Development would be **medium**. This would be a reduction compared to the medium to high rating for the Original Scheme. The effect of the Revised Development would be **significant**, as assessed in respect of the Original Scheme.

9.3.19 The removal of four of the original nine turbines would increase the separation distance between the viewpoint and the nearest turbine from 1.56km to 2.00km. While this would reduce the prominence of the construction works in views from the A835 and Aultguish Inn, the presence of the tall construction crane and other large plant would form a notable feature, despite its proximity to the operational turbines and the baseline influence they have on the view.

9.3.20 During operation, the magnitude of change relating to the Revised Development would be **medium to low**. This would be a reduction compared to the medium rating for the Original Scheme. The effect of the Revised Development would be **not significant**, which would remove the significant effect assessed in respect of the Original Scheme.

9.3.21 The comparative wirelines in Figure 9.21c illustrates how the removal of the four most northerly turbines would reduce the prominence of the Revised Development in the view by reducing both the vertical and horizontal scale of the Revised Development. They also show how the remaining turbines would be of a scale more closely comparable with the turbines of the Operational Wind Farms and this would increase the sense of unity and their perceived integration with the operational turbines.

Viewpoint 2: A835, Black Bridge Road

9.3.22 During construction, the magnitude of change relating to the Revised Development would be medium and the effect of the Revised Development would be significant, as assessed in respect of the Original Scheme.

9.3.23 The removal of four of the original nine turbines would increase the separation distance between the viewpoint and the nearest turbine from 1.56km to 2.00km. While this would reduce the prominence of the construction works in views from the A835 and Aultguish Inn, the presence of the tall construction crane and other large plant would form a notable feature, despite its proximity to the operational turbines and the baseline influence they have on the view.

9.3.24 During operation, the magnitude of change relating to the Revised Development would be **medium to low**. This would be a reduction compared to the medium rating for the Original Scheme. The effect of the Revised Development would be **not significant**, which would remove the significant effect assessed in respect of the Original Scheme.

9.3.25 The comparative wirelines in Figure 9.22b illustrates how the removal of the four most northerly turbines would reduce the prominence of the Revised Development in the view by reducing both the vertical and horizontal scale of the Revised Development. The separation distance between the viewpoint and the nearest turbine would be increased from 3.65km to 3.93km owing to the closest turbines being removed. The remaining turbines would appear more

closely associated with the background hills and appear more closely comparable in scale to the nearby operational turbines. In light of the existing influence of the Operational Wind Farms on the views of west-bound road-users on this section of the A835, the Revised Development would have a more limited magnitude of change and overall effect compared to the Original Scheme.

Viewpoint 4: Old Drover's Road, Corriemoillie

9.3.26 During construction, the magnitude of change relating to the Revised Development would be medium and the effect of the Revised Development would be significant, as assessed in respect of the Original Scheme. Despite the fewer turbines being constructed, the presence of the tall cranes would create an additional feature that would alter the character of the views from this route, albeit only over the short-term.

9.3.27 During operation, the magnitude of change relating to the Revised Development would be medium to low and the effect of the Revised Development would be not significant, as assessed in respect of the Original Scheme.

Viewpoint 5: Ben Wyvis

9.3.28 During construction, the magnitude of change relating to the Revised Development would be medium to low and the effect of the Revised Development would be not significant, as assessed in respect of the Original Scheme. Despite the fewer turbines being constructed, the presence of the tall cranes would create an additional feature that would alter the character of the views from this route, albeit only over the short-term.

9.3.29 During operation, the magnitude of change relating to the Revised Development would be low. This would be a reduction compared to the medium to low rating for the Original Scheme. The most notable change occurs in respect of the reduced horizontal extent of the Revised Development, as illustrated in the comparative wirelines in Figure 6.25c. From the easterly location of the viewpoint, the removal of the four most northerly turbines is most pronounced and results in the Revised Development appearing more compact. The effect of the Revised Development would be not significant, as assessed in respect of the Original Scheme.

Viewpoint 8: Beinn a Chaisteil

9.3.30 During construction, the magnitude of change relating to the Revised Development would be medium to low and the effect of the Revised Development would be not significant, as assessed in respect of the Original Scheme.

9.3.31 During operation, the magnitude of change relating to the Revised Development would be medium to low and the effect of the Revised Development would be not significant, as assessed in respect of the Original Scheme.

Summary of updated visual effects

9.3.32 OPEN has reviewed each of the viewpoint and visual receptor assessments in light of the changes in the Revised Development and can confirm that the changes would not give rise to any additional, significant, visual effects. In respect of nine of the 12 viewpoints there would be no change in the assessment of magnitude of change or significance of effects. In respect of the remaining three viewpoints, there would be a reduction in the magnitude of change either at the construction and/or operational phase and in respect of two of these viewpoints these reductions would lead to a significant effect being reduced to a not significant effect.

9.3.33 In visual terms, the changes that would arise as a result of removing turbines T2, T3, T9 and T10 are discernible in Viewpoints 1 and 2, which represent views from the A835, and Viewpoints 5 and 8, which represent views from the nearby mountain summits. The Revised Development would result in a combination of the following mitigation:

- The turbine removals increase the separation distance between the A835 / Aultguish Inn and the Revised Development; and

- The turbine removals reduce the horizontal field of view affected, especially when viewed from Ben Wyvis, thereby producing a more compact array.

9.3.34 In OPEN's professional opinion, there is an apparent reduction in the prominence of the Revised Development from locations on the A835 to the north of the Revised Development and Ben Wyvis to the east. The changes made to the layout reduce the potential effects within these localised areas of visibility.

9.4 Updated Assessment of Cumulative Effects

9.4.1 Since the submission of the EIA Report in January 2019, the cumulative situation, within the 40km cumulative assessment study area, has undergone some limited change, either in relation to the change in status of wind farms (i.e. from scoping to application or consented) or the introduction of some new application sites. The most relevant of these changes to the cumulative assessment of the Revised Development is the submission of Kirkan Wind Farm as a new application. Its relevance relates to its close proximity, situated to the immediate south-east of the Revised Development. The Applicant, therefore, considers that it would be useful at this stage to provide an updated cumulative assessment, consisting of written and illustrative material.

9.4.2 This SI Chapter should be read in conjunction with the original EIA Report, where further information on the methodology used for cumulative assessment and the assessment of cumulative effects of the Revised Development is provided. The findings of this SI update the findings of the EIA Report.

9.4.3 In the EIA Report, the cumulative assessment related principally to the close-range operational sites including Lochluichart, Lochluichart Extension and Corriemoillie, referred to collectively in the EIA Report as the 'Operational Wind Farms'. As these are all operational, they form part of the baseline context against which the solus assessment in Sections 9.7 and 9.8 is considered.

9.4.4 The in-conjunction cumulative assessment In Sections 9.7 and 9.8 of the EIA Report also considers the addition of the Revised Development in respect of the baseline comprising the Operational Wind Farms. The in-conjunction cumulative assessment focuses more specifically on the additional effect of the Revised Development in-conjunction with the Operational Wind Farms than the solus assessment.

9.4.5 An in-combination cumulative assessment is presented in Section 9.9. This considers the overall effect of the Revised Development and the Operational Wind Farms on the existing pattern of wind farm development in this area. As the potential effects of the in-combination assessment are likely to cover a wider extent, certain landscape and visual receptors that are not assessed in the solus or in-conjunction cumulative assessment, are included in the in-combination assessment.

9.4.6 In respect of the Original Scheme, the in-conjunction assessment identified only one significant effect out of all the landscape and visual receptors assessed. This occurred in respect of Viewpoint 1: Aultguish Inn.

9.4.7 In respect of the Original Scheme, the in-combination assessment identified significant effects in respect of localised parts of four landscape character receptors, one designated landscape and one Wild Land Area, as well as four viewpoints.

Illustrative Material

9.4.8 A cumulative ZTV has been prepared to support the analysis of the cumulative interaction between the Revised Development and application stage, Kirkan Wind Farm, which lies approximately 1.7km to the south-east of the Revised Development. This is included in SI Volume 2 at Amended Figure 9.35. Updated cumulative wirelines that illustrate the current cumulative situation at each of the EIA Report viewpoints are shown in Figures within SI Volume 2

9.4.9 The cumulative effects that will arise as a result of the Revised Development will relate chiefly to those wind farm developments that are located within 5km of the Revised Development. Within this range, the only material change, which has the potential to alter the EIA Report assessment, is the addition of Kirkan Wind Farm as an Application. All other wind farms beyond this range have either previously been considered in the 2019 cumulative assessment or are too distant to have a notable bearing on the cumulative assessment.

In-Conjunction Cumulative Effects

9.4.10 The following tables assess the implication of adding application stage Kirkan Wind Farm to the cumulative assessment of the Revised Development. Changes to the EIA Report assessment are highlighted by grey shading.

Table 9.6 Updated summary of in-conjunction cumulative effects

Receptor	Sensitivity	Cumulative magnitude of change (EIA Report 2019)	Cumulative significance of effect (EIA Report 2019)	Cumulative magnitude of change (SI 2019)	Cumulative significance of effect (SI 2019)
Rounded Hills: Ben Wyvis LCU	medium to high	medium to low	not significant	medium to low	not significant
Rounded Hills: Lochluichart LCU	medium	medium to low	not significant	medium to low	not significant
Rounded Hills: Inchbae LCU	medium	medium to low	not significant	medium to low	not significant
Undulating Moorland: Aultguish LCU	medium	medium to low	not significant	medium to low	not significant
Ben Wyvis SLA	medium to high	medium to low	not significant	medium to low	not significant
Rhiddoroch – Beinn Dearg – Ben Wyvis WLA	medium to high / medium in the south-west	medium to low	not significant	medium to low	not significant
1. Aultguish Inn	medium – road-users medium / high - residents	medium	significant - residents and road-users	medium to low	significant – residents not significant – road-users
2. A835 Black Bridge Road	medium	medium to low	not significant	low	not significant
3. Garve Bridge	medium	low	not significant	low	not significant
4. Old Drover's Road, Corriemoillie	medium	medium to low	not significant	low	not significant
5. Ben Wyvis	medium to high	medium to low	not significant	low	not significant
6. An Coileachan	medium to high	low	not significant	low	not significant
7. Sgurr Mor	medium to high	low	not significant	low	not significant
8. Beinn a Chaisteil	medium to high	low	not significant	low	not significant
9. Avenue of Fairburn Estate	medium	low	not significant	low	not significant
10. Sgurr a Mhuilinn	medium to high	low	not significant	low	not significant
11. Sgurr a Choire Ghlais	medium to high	low	not significant	low	not significant
12. Beinn Dearg	medium to high	low	not significant	low	not significant

9.4.11 The one significant effect that had been identified in the EIA Report in relation to Viewpoint 1: Aultguish Inn, would remain significant for residents at Aultguish Inn and be reduced to not significant for road-users on the A835.

The wireline in Figures 9.21b and 9.21c shows how the cumulative context would be altered by the introduction of visibility of 17 application turbines belonging to Kirkan Wind Farm to the left of the Revised Development (nine seen to below the nacelle and eight as blades or tips). These would be seen in addition to the 21 operational turbines which form part of Corriemoillie, Lochluichart and Lochluichart Extension (14 seen to below the nacelle and seven as blades or tips). It is in the context of this expanded cumulative baseline including Kirkan application wind farm, that the reduced number of turbines and their further recessed location from the viewpoint would give rise to a cumulative magnitude of change would be reduced from medium, to medium to low.

9.4.12 The combination of the medium to low magnitude of change with the medium to high sensitivity of residents would give rise to a significant effect, while the combination of the medium to low magnitude of change with the medium sensitivity of road-users would give rise to a not significant effect.

9.4.13 The updated in-conjunction cumulative assessment finds that the addition of the Revised Development to a scenario where Kirkan Wind Farm is included in the baseline does not give rise to any additional significant effects on either landscape or visual receptors and the one significant effect that was previously assessed would be reduced such that it would apply to only residents and not road-users.

In-Combination Cumulative Effects

9.4.14 As the in-combination cumulative effects relate to the effect of all the operational and proposed developments together, despite the reduction in the number of the turbines in the Revised Development, the increased number of proposed turbines relating to application wind farm Kirkan, the overall effect would remain broadly as originally assessed.

9.5 Summary

9.5.1 This chapter of the SI has assessed the landscape and visual effects, including cumulative effects, of the reduction in the number of turbines for the Revised Development. It has found that the changes sought by THC Planning Officer, whilst notably reducing the capacity of the Revised Development in a localised area already influenced by wind farm development, would inevitably reduce some of the magnitude of change ratings and remove some of the significant effects previously assessed for the Original Scheme. The reduced effects would occur in the area to the immediate north of the Revised Development where increased separation distances would reduce the apparent prominence, field of view and apparent height of the Revised Development as experienced from the A835 and nearby hill top summits. This would be beneficial in landscape and visual terms.

9.5.2 The updated in-conjunction cumulative assessment has considered application stage Kirkan Wind Farm as part of the cumulative context and the addition of the Revised Development to this cumulative context. The finding has been that no additional, significant, in-conjunction, cumulative landscape and visual effects, would arise in respect of the Revised Development and updated cumulative context. the one significant effect that was previously assessed

would be reduced such that it would apply to only residents and not road-users. Despite the reduced number of turbines in the Revised Development, the in-combination cumulative effects would remain broadly as previously assessed owing to the greater extent of wind farm development associated with Kirkan Wind Farm.

9.5.3 Overall, the reduction from nine to five turbines would reduce the extent of landscape and visual effects by keeping the layout more closely located towards and associated with the Operational Wind Farms.

9.5.4 An update to the Revised Development subsequent to the preparation of the SI Chapter and Figures has been made and comprises the movement of T4 by 24m to the north-east and the removal of the access track spur connecting T6 to the Operational Wind Farms. The removal of the track would reduce the overall extent of infrastructure visible on the site and therefore would reduce the landscape and visual effects of the infrastructure.

9.5.5 The wirelines in Figures 9.21c to 9.32c illustrate how incremental this change would be by comparing the position of T4 in the Revised Development with its position when moved 24m to the north-east. This movement is relatively small and is well within the 50m allowance for micro-siting turbines applied during construction. A comparison of the wirelines from each of the representative viewpoints shows that the movement of T4 would not alter the findings of the assessment made in the SI. This chapter therefore concludes that there would be no material difference to the assessment made in the SI owing to these subsequent changes.

10. Cultural Heritage

10.1 Introduction

10.1.1 This chapter presents an updated assessment of the effects of the 5-turbine Lochluichart Wind Farm Extension II (see Chapter 3 for further information, and hereafter known as 'the Revised Development') on the Historic Environment. The assessment was undertaken by Headland Archaeology (UK) Ltd. The objectives of this assessment are to:

- Assess the likely scale of any impacts on the historic environment posed by the development;
- Outline suitable mitigation measures to avoid, reduce or offset significant adverse effects; and
- Provide an assessment of any residual effects remaining after mitigation.

10.1.2 The Environmental Impact Assessment Report (hereafter known as the 'EIA Report 2019'), which supported the application for the 9-turbine Lochluichart Wind Farm Extension II (hereafter referred to as 'the Original Scheme'), described the cultural heritage baseline, and identified potential impacts and effects upon it arising from the nine-turbine layout.

10.1.3 The methodology, legislation, policy and guidance used in the EIA Report for the Original Scheme, as well as the baseline and conclusions regarding effects, remain largely applicable to this SI. Any changes to these topics since the EIA Report are outlined in the text below, otherwise the EIA Chapter remains valid.

10.2 Policy and Guidance

10.2.1 The assessment has been undertaken with reference to relevant legislation, policy and guidance relating to Cultural Heritage.

10.3 Legislation

10.3.1 Legislation relating to Cultural Heritage remains unchanged since EIA Report.

10.4 Planning Policy

National Planning Policy

10.4.1 The Scottish Government's planning policies in relation to the historic environment (as outlined in Scottish Planning Policy (SPP, the Scottish Government, June 2014) remains unchanged. However, May 2019 saw the introduction of the Historic Environment Policy for Scotland (HEPS, 2019) and the Historic Environment Scotland Circular (2019). These supersede the Historic Environment Scotland Policy Statement 2016 (HESPS) and the Historic Environment Circular 1 (2016) but continue to complement the SPP and provide further policy direction. In particular, HEPS provides more detailed policy on historic environment designations and consents.

Local Planning Policy

10.4.2 Policy 57 Natural, Built and Cultural Heritage of the Highland-wide Local Development Plan (HwLDP, adopted in April 2012) remains in force.

Guidance

10.4.3 The introduction of HEPS in 2019 also saw the publication of Designation Policy and Selection Guidance (DPSG, HES 2019) to accompany HEPS. DPSG outlines the policy and selection guidance used by HES when designating sites and places of national importance.

10.4.4 All other guidance documents referred to in the EIA Report remain applicable.

Consultations

10.4.5 No consultation on Cultural Heritage issues was carried out for this SI.

Methodology

10.4.6 The methodology used in this SI remains unchanged from that employed in the EIA Report.

Data sources

10.4.7 Data sources remain unchanged since the EIA Report, with the exception of the Highland Council Historic Environment Record (HER). Due to the expiry of the licence for use of the 2018 data, an updated extract was obtained from the HER in July 2019.

Baseline Conditions

10.4.8 The baseline conditions of the ISA and OSA are unchanged since the EIA Report.

'Do Nothing' Scenario

10.4.9 Conditions affecting the survival of archaeological remains are unchanged since the EIA Report.

Information gaps

10.4.10 The reliability of this assessment is unchanged since the EIA Report.

10.5 Impact Assessment

Construction Impacts

10.5.1 Likely construction impacts are unchanged since the EIA Report.

Predicted Construction Impacts

10.5.2 Predicted construction impacts are unchanged since the EIA Report.

Proposed Mitigation

10.5.3 Mitigation measures of construction impacts remain unchanged from those proposed in the EIA Report.

Operational Impacts

10.5.4 The deletion of four turbines has further reduced the visibility of the Revised Development from heritage assets in the ISA and OSA. Predicted operational impacts remain negligible in magnitude and, therefore, are unchanged since the EIA Report.

Proposed Mitigation

10.5.5 No mitigation is proposed with respect to operational effects affecting the setting of heritage assets.

Decommissioning Impacts

10.5.6 Any decommissioning impacts would be limited to the construction footprint, and consequently there would be no further impacts beyond those discussed in paragraphs 10.86 to 10.89 of the EIA Report.

Residual effects

Summary of residual effects

10.5.7 Residual effects remain unchanged from those identified in the EIA Report.

Cumulative Effects

10.5.8 As detailed in paragraph 10.57 of the EIA Report, cumulative impacts are considered in cases where an effect of more than negligible significance has been predicted on the setting of a heritage asset as a result of the Revised Development. No setting effects of more than negligible significance have been predicted, and therefore no cumulative impacts will occur.

11. Ecology

11.1 Introduction

11.1.1 This chapter addresses the potential effects of the revised 5-turbine Lochluichart Wind Farm Extension II (see Chapter 3 for further information, and hereafter known as 'the Revised Development') has on the Ecology

resource and supplements Chapter 11: Ecology of the 2019 Environmental Impact Assessment Report (hereafter known 'EIA Report') which supported the application for the 9-turbine Lochluichart Wind Farm Extension. This chapter should be read in conjunction with the 2019 EIA Report.

11.1.2 Overall, no changes to the residual effects are anticipated. Habitat loss areas are recalculated and further details are provided on the provision of a Habitat 0Management Plan (HMP) and outline measures for the Construction Environmental Management Plan (CEMP).

11.1.3 Where information does not require updating between this document and the EIA Report, this is stated, and the original information is only reproduced where it provides context for the updated assessment. Paragraph numbers are not consistent with the original Chapter 11: Ecology.

11.2 Key Legislation and, Policy and Guidance

11.2.1 As relevant policy, legislation and guidance remain unchanged, please refer to Section 11.10 of the EIA Report for details.

11.3 Scope of Assessment

11.3.1 As the scope of the assessment remains unchanged, please refer to Section 11.11 to 11.19 of the EIA Report for details.

11.3.2 In addition to consultation correspondence presented in Table 11.1, responses to the EIA Report have been received from SNH, RSPB and SEPA. These are provided in below in Table 11.1a.

Table 11.1a: Consultation Responses Received on EIA Report

Consultee	Date	Summary of Response	How response has been addressed
SNH	10/05/2019	Conflicting information between peat and habitat maps. Further clarification required on location of blanket bog and wet heath habitats to determine potential effects.	**Figure 11.1** and **Figure 11.2** have been revised and updated to provide further clarification on location of habitats.
RSPB	31/05/2019	Recommend updating the cumulative assessment to include the proposed Kirkan Wind Farm. Recommended that turbines on peat depths greater than 0.5m along with associated access tracks and infrastructure are re-located or removed to	Cumulative assessment updated for Revised Development and included herein. The Revised Development has removed 4 of the 9 turbines and presents a reduced 5 turbine scheme, of which three are located in blanket bog compared to 6 in

Consultee	Date	Summary of Response	How response has been addressed
		reduce impacts on Peatland habitat. Any habitat loss should be restored and/or compensated.	the EIA Report. Habitat restoration and enhancement will also be provided and further information is provided within this Chapter.
SEPA	16/04/2019	Welcome a HMP but request clarification on whether one will be produced and what compensatory action is proposed. Request that the CEMP includes specific measures for mitigation of sensitive habitats.	A HMP will be agreed and secured by condition post consent. The HMP will include for enhancement of wet heath and blanket bog habitats onsite. Habitat mitigation measures and restoration will be included and secured by condition. Further information is provided within this Chapter.

11.4 Baseline Methodology

11.4.1 As the methodology of the assessment remains unchanged, please refer to Section 11.20 to 11.35 of the EIA Report for details.

11.5 Assessment Methodology and Significance Criteria

11.5.1 As the assessment methodology and significance criteria of the assessment remains unchanged, please refer to Section 11.36 to 11.59 of the EIA Report for details.

11.6 Baseline Conditions

11.6.1 As the baseline conditions of the assessment remains unchanged, please refer to Section 11.60 to 11.117 of the EIA Report for details.

11.7 Embedded Mitigation and Scheme Design Evolution

11.7.1 The embedded mitigation and scheme design evolution remains unchanged from those provided within the EIA Report.

11.7.2 Additional measures relevant to the Revised Development include:

Construction Environmental Management Plan

11.7.3 A CEMP will be in place during the construction, operational and decommissioning phases of the development. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the development in line with current

guidance (SNH, 2015) and as detailed within Chapter 13 "Hydrology and Hydrogeology" of the EIA Report.

11.7.4 The CEMP will also include full details of restoration/re-instatement of habitats during the construction phase. The CEMP will include the provision of an Ecological Clerk of Works during the construction phase, tool-box talks, protection of sensitive habitats, soil stripping, soil & peat storage and method statements for restoration/re-instatement. Further details provided under Mitigation.

11.7.5 The CEMP will be submitted to THC for approval prior to the commencement of construction works, in consultation with the Scottish Environmental Protection Agency (SEPA) and SNH.

11.7.6 The CEMP will serve to negate any potentially significant effects upon ecological features as a result of the escape of sediments and pollutants beyond the footprint of the Revised Development.

Habitat Management Plan

11.7.7 A HMP will be produced which will include restoration measures of the most sensitive habitats and subsequent monitoring will measure the effectiveness of restoration works, with restoration works adaptable in response to monitoring outcomes. The HMP will also include the management of habitats across the site to provide an overall net gain.

11.8 Important Ecological Features

11.8.1 The importance of ecological features provided within Section 11.118 to 11.120 of the EIA Report remains unchanged.

11.9 Potential Effects in the Absence of Mitigation

11.9.1 Potential construction related effects in the absence of mitigation for the Revised Development have been updated for habitats and water vole. Potential effects during the operational and decommissioning phases remain unchanged from the EIA Report.

Habitats

Construction Effects

11.9.2 The total footprint of the Revised Development i.e. the area to be permanently lost under the surface footprint of the proposed turbine hardstandings, access track and associated infrastructure is approximately 10.22ha. This constitutes approximately 1.8% of the total Revised Development (596ha).

11.9.3 An additional 21.88ha will be affected during the construction phase to facilitate construction working areas and two borrow pits.

11.9.4 A summary of habitats to be lost permanently under the built footprint of the Revised Development is provided in Table 11.8.

Table 11.8: Permanent habitat losses.

Phase 1 Habitat Type	Area Lost	Corresponding NVC Community
Blanket bog	7.42	M17
Wet heath	2.80	M15

11.9.5 A total of 10.22ha of Annex 1 habitats, comprising blanket bog (M17) and wet heath (M15) habitats, will be lost permanently during construction (Figure 11.1 and 11.2). Just over half of this habitat loss (5.6ha of 10.22ha) comprises poor-quality plantation forestry on top of blanket bog and wet heath habitats, which are therefore poor-quality examples of the Annex 1 habitat types.

11.9.6 Permanent habitat loss represents a very small loss in the total area of these habitats remaining both within the Revised Development and the surrounding area. Thus, the impact will be minor and unlikely result in a significant effect in a local context.

11.9.7 Habitats of local importance would also not be considered significant in the context of their availability within the Revised Development and local area.

11.9.8 The notable plant species (alpine bearberry, dwarf birch and lesser twayblade) are all located within blanket bog habitat and the loss of this habitat may also result in the reduction of these species in the Locale, albeit at a low level.

11.9.9 Indirect physical effects arising from the development (such as alterations to drainage patterns) will be limited by the adoption of proven construction techniques that minimise environmental damage and maintain the integrity of the peatland system. This will include the use of floating roads where the tracks cross hydrologically sensitive areas of deeper peat. Full details are presented in Chapter 13.

11.9.10 During the construction phase an additional 21.88ha of temporary onsite habitat disturbance will also occur. This area is based on highly pre-cautionary a 30m corridor around the permanent footprint of the development, required for construction working areas, construction compounds, temporary laydown areas, drainage, borrow pits and cabling. Habitats primarily affected will be blanket bog M17 (9.37ha) and wet heath M15 (12.52ha).

11.9.11 These temporary Annex 1 habitat losses will be reinstated and restored following the completion of construction works in accordance with HSPPs, and as such losses would be considered short-term and reversible. Subsequently the impact will be of negligible/minor magnitude and therefore not significant.

11.9.12 The on-site habitats to be lost both permanently and temporarily as a result of the Revised Development are considered to be widespread habitats throughout the Northern Highlands.

Water Vole

Construction Effects

11.9.13 The construction of the Revised Development has the potential to impact upon water voles and lead to a population level effect at a local level as a result of:

- Habitat loss and deterioration;
- Habitat fragmentation;
- Incidental mortality and disturbance; and,
- Pollution.

11.9.14 The spatial extent over which works will be occurring is considered to be highly localised and is only likely to impact upon a small number of individual water vole territories.

11.9.15 The construction of 1no. water course crossings as shown in Figure 11.1 and 11.2 will require the permanent loss of approximately 20m of ditch bank habitat (10m assumed either side of the ditch) available for potential use by the established water vole population within the Revised Development.

11.9.16 In the context of remaining available and suitable habitat for water voles within the Revised Development and locally, the effects of the Revised Development are not anticipated to be significant and will not affect the favourable conservation status of the species.

11.9.17 The design can result in the severance of habitats and restriction of movement for water voles from these territories along watercourses within the Revised Development. One unavoidable crossing is required over a burn supporting water voles. Without mitigation, habitat fragmentation is considered certain, permanent and largely irreversible and an impact of medium magnitude and significant on local water vole populations.

11.9.18 The construction of water course crossings has the potential to result in the damage or destruction of water vole burrows and/or killing or injuring of individual water voles. The mobility of the species allows for escape and as such loss of life is considered to be unlikely and comprise no more than a minor/medium magnitude impact and significant effect on local water vole populations.

11.9.19 Noise and visual disturbances are generally considered unlikely to have any significant impacts upon water voles (Dean *et al*., 2016) however, should disturbances occur to the point at which a water vole may potentially abandon its burrow, this would constitute a breach of the provisions of the Wildlife and Countryside Act 1981 (as amended in Scotland).

11.9.20 The potential for effects upon water voles as a result of the escape of sediments and pollutants into the surrounding aquatic and terrestrial environment is considered to be adequately mitigated through embedded sensitive scheme design, standard best practice construction methods and pollution prevention controls in accordance with current guidance, as detailed within Chapter 13 "Hydrology and Hydrogeology".

11.9.21 Mitigation measures are required and are outlined to ensure legislative compliance during the construction phase.

11.10 Mitigation

11.10.1 The mitigation provided within Section 11.152 to 11.168 of the EIA Report remain unchanged.

11.10.2 Further details are provided on Habitat Re-instatement and water vole mitigation.

Habitat Reinstatement

11.10.3 Full details of habitat restoration/reinstatement will be provided within the CEMP. Measures will follow 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites 2009' and 'Good Practice during Wind Farm Construction – Joint Publication 2015'. Habitat restoration will be overseen by the ECoW and include the following fundamental principles.

- Following the construction phase, all temporary site offices, containers, machinery and equipment shall be removed and temporary construction compound(s), track verges and any temporary working or stockpiling areas shall be fully reinstated, unless otherwise agreed with the LPA.
- Soils and turves will be stripped and stored in line with current good practice guidance, and maintained in a viable condition ready for reinstatement.
- So far as reasonably practical, all disturbed areas which require reinstatement will be reinstated with the same vegetation types as exist at present, thereby ensuring minimal disruption to the surrounding habitats.
- Storage of materials will not be permitted outside of approved and prepared storage areas or within 50m of watercourses.
- Stripped soil will be reinstated as close to where it was removed as possible. This will help to maintain a local seed base and local/geological/hydrological characteristics.
- Subsoil, topsoil and turfs will be replaced in same order as removed.
- During periods of dry weather, exposed peat shall be kept moist.
- Unless otherwise agreed, turfs will be re-instated following the works and oriented vegetation side up.
- Reinstatement will be carried out as soon as possible following stripping to ensure integrity of material is maintained.
- Where turfs are not available, areas will be left to vegetate naturally.
- Excess soil or contaminated soil will be disposed of offsite at a licenced facility.
- Reinstatement of construction area will be undertaken to a high standard, using existing soil and vegetation material where possible, in accordance with current best practice.
- If re-vegetation is not successful and has not occurred within an agreed period of time, further consultation with SNH and SEPA will agree a course of action which could include re-seeding using a native mix or translocation from other habitats onsite.
- No mineral soil or clay-based soil will be used for habitat reinstatement along the sides of tracks, to prevent silt run off into surrounding habitats.
- Temporary laydown areas will avoid areas of blanket bog and guided by the ECoW.
- Soil within areas of temporary use will also be protected once the top turf layer has been removed by the use of geotextile base to facilitate the removal of any engineer fill required.

Water Vole

11.10.4 Water voles are protected in Scotland under the provisions of the Wildlife and Countryside Act 1981 (as amended). The species is listed on Schedule 5 of the Act and is protected under Section 9, which makes it an offence to:

- Damage, destroy or obstruct access to a water vole burrow; or
- Disturb a water vole whilst it is using its burrow.

11.10.5 The layout of the Revised Development has been optimised in so far as has been possible to avoid construction activities occurring in close proximity to the watercourse network within the Revised Development and the requirement for watercourse crossings.

11.10.6 One watercourse crossing to access T8 is however unavoidable to permit an operational development and will therefore likely result in the damage or destruction of burrows and/or disturbance of water voles within their burrows.

11.10.7 A Water Vole SPP will be prepared for the development in accordance with Dean *et al*. (2016) and SNH (2017e) guidance. Mitigation measures will include a 10m exclusion zone around active water vole burrows, informed by the pre-construction survey. If this cannot be achieved, a licence from SNH may be required.

11.10.8 Water vole populations are highly dynamic with the potential for individual water voles to establish or abandon territories in relatively short spaces of time. As such, the SPP will be finalised in consultation with THC and SNH following a pre-construction water vole survey undertaken (as above) in accordance with current guidance.

11.10.9 Water vole monitoring will be undertaken in the first three years of operation to establish if water vole colonies have been affected by the wind farm extension development. Remedial measures and/or habitat enhancement measures can be proposed based on monitoring results.

11.11 Residual Effects

11.11.1 Residual effects remain unchanged from Section 11.169 in the EIA Report.

11.12 Cumulative Effects

11.12.1 Residual effects remain unchanged from Section 11.170 to 11.1771 in the EIA Report.

Enhancement Measures

11.12.2 A HMP will be produced which will include restoration measures of the most sensitive habitats and also provide enhancement of Annex 1 habitats within the Revised Development. The HMP will also include measures to enhance the habitats within the Revised Development for protected species.

11.12.3 The HMP will include a detailed work programme, method statements for habitat enhancement, reporting mechanisms and a monitoring and review strategy.

11.12.4 The HMP will be prescribed and agreed in consultation with SNH and seek to provide net biodiversity gains.

11.13 Summary of Effects

11.13.1 No potentially significant effects upon ecological features resulting from the Revised Development alone or in-combination are identified.

11.13.2 Mitigation measures are included for the construction phase of the development for habitats and water voles and to ensure legislative compliance for other protected species. Providing implementation, no breach of the provisions of the relevant legislation will occur.

Table 11.9 Summary table of effects upon the recorded ecological features.

Feature	Proposed Activity	Characterisation of unmitigated impact upon feature	Significance without mitigation and confidence level	Mitigation and Enhancement	Residual significance of effect and confidence level (following mitigation)
Habitats	Construction and operation of the site infrastructure and construction-related mobilisation or release of contaminants.	Loss of 10.22ha or 1.8% and reduction in habitat quality.	Negative, permanent. Minor magnitude. Non-Significant effect.	CEMP and Pollution Prevention Measures. Habitat reinstatement after construction.	Not significant
Water Vole	No change				

References

Construction Code of Practice for the Sustainable Use of Soils on Construction Sites 2009.
Good Practice during Wind Farm Construction – Joint Publication 2015.

12. Ornithology

12.1.1 This chapter addresses the potential effects of the revised 5-turbine Lochluichart Wind Farm Extension II (see Chapter 3 for further information, and hereafter known as 'the Revised Development') has on the Ornithology resource and supplements Chapter 12: Ornithology of the 2019 Environmental Impact Assessment Report (hereafter known 'EIA Report') which supported the application for the 9-turbine Lochluichart Wind Farm Extension. This chapter should be read in conjunction with the 2019 EIA Report.

12.1.2 Overall, no changes to the residual effects are anticipated. Habitat loss areas are recalculated as well as the Collision Risk Window in recognition of the reduction in the number of turbines. Further information is also provided for a Construction Environment Method Statement (CEMP) and the cumulative assessment has been updated.

12.1.3 Where information does not require updating between this document and the EIA Report, this is stated, and the original information is only reproduced where it provides context for the updated assessment. Paragraph numbers are not consistent with the original Chapter 12: Ornithology.

12.2 Key Legislation, Policy and Guidance

12.2.1 As relevant policy, legislation and guidance remain unchanged, please refer to Section 12.13 of the EIA Report for details.

12.3 Scope of the Assessment

12.3.1 As the scope of the assessment remains unchanged, please refer to Section 12.14 to 12.17 of the EIA Report for details.

12.3.2 In addition to consultation correspondence presented in Table 12.1, responses to the EIA Report have been received from SNH and RSPB. These are provided in below in Table 12.1a.

Table 12.1a: Consultation Responses Received on EIA Report

Consultee	Date	Summary of Response	How response has been addressed
SNH	10/05/2019	SNH consider that the introduction of additional turbines in this location will not adversely impact the red throated diver population in the locality. Recommend implementing a post construction monitoring program similar to the one in	A HMP will be provided, to be agreed post consent and secured by suitable planning condition. No significant impacts on divers are predicted. A diver raft will be provided as part of a HMP, on a suitable loch in the local area.

Consultee	Date	Summary of Response	How response has been addressed
		place at Lochluihcart Extension I.	
RSPB	31/05/2019	Recommend the installation of a red-throated diver raft on a suitable loch in the area. Habitat enhancement should include measures for black grouse. Recommended a series of mitigation measures to be implemented during the construction phase to protect black grouse.	No significant impacts on divers are predicted. A diver raft will be provided as part of a HMP, on a suitable loch in the local area. A HMP will be provided, to be agreed post consent and secured by suitable planning condition. A CEMP will accompany the Revised Development which will include a Breeding Bird Protection Plan (BBPP), to be secured by suitable planning condition.

12.4 Baseline Methodology

12.4.1 As the methodology of the assessment remains unchanged, please refer to Section 12.18 to 12.49 of the EIA Report for details.

12.5 Assessment Methodology and Significance Criteria

12.5.1 As the assessment methodology and significance criteria of the assessment remains unchanged, please refer to Section 12.50 to 12.80 of the EIA Report for details.

12.6 Baseline Conditions

12.6.1 Baseline conditions of the assessment in Sections 12.81 to 12.93 remain largely unchanged, with the exception of the number of Target Species entering the newly calculated Collision Risk Window. No further details are repeated

Flight Activity VP Surveys

12.6.2 The collision risk window has been recalculated for the Revised Development to accommodate for the reduced number of turbines.

12.6.3 An updated summary of target species flight activity which occurred within the Collision Risk Window (CRW) between September 2012 and August 2014 is presented within Table 12.8.

Table 12.8: Summary target species flight activity within the CRW.

Species	Occupancy	No. of Flights	No. of Birds
Greylag goose	Spring migration	2	502
Merlin	Breeding	1	1
Osprey	Breeding	2	2
Hen harrier	Non-breeding	1	1
Red kite	Non-breeding	1	1
Golden plover	Breeding	4	6

12.6.4 Flight activity recorded was very low and with recognition of SNH scoping response, was considered insufficient to inform robust collision risk modelling and was therefore not undertaken.

12.7 Embedded Mitigation and Scheme Design Evolution

12.7.1 The embedded mitigation and scheme design evolution remains unchanged from those provided within the EIA Report in Sections 12.94 to 12.103.

12.8 Important Ornithological Features

12.8.1 The importance of ecological features provided within Section 12.104 to 12.106 of the EIA Report remains unchanged.

12.9 Potential Effects on Ornithological Features

12.9.1 Potential effects on ornithological features remains unchanged from those provided within Sections 12.107 to 12.133, with the exception of the reduction in habitat loss area to 10.22ha (including footprint of turbines, on-site tracks, crane hardstanding's, construction compounds and substation), which equates to approximately 1.8% of the total Revised Development area.

12.9.2 During the construction phase revised additional habitat losses of approximately 21.88ha are also estimated as a result of construction working areas and borrow pit.

12.9.3 The revised figure for forestry removal is reduced to 5.6ha of plantation forestry which includes an 80m buffer of turbine locations.

12.10 Potential Effects in the Absence of Mitigation

12.10.1 Potential operational related effects in the absence of mitigation for the Revised Development for golden eagle have been updated in reflection of updated habitat loss figures and reduction in turbine numbers.

12.10.2 The potential effects for other species remain unchanged from the EIA Report Sections 12.134 to 12.253.

Golden Eagle

Operational Phase Impacts

12.10.3 The construction of the Revised Development will result in a direct and permanent loss of approximately 10.22ha of open moorland habitats representing 1.8% of the total Revised Development area. In addition,

construction works are also anticipated to result in the temporary loss of an additional 21.88ha of habitats to facilitate construction working areas.

12.10.4 Collectively, current research suggests little clear evidence for long-term displacement effects upon golden eagles as a result of operational wind farms (as reviewed by Humphreys *et al*., 2017).

12.10.5 A single long-term study of potential displacement effects upon the species at the adjacent wind farms of Edinbane and Ben Aketil on the Isle of Skye, did suggest the occurrence of displacement on the basis of decrease in spatial use habitats within 500m of operational turbines during initial years of operational monitoring (Haworth Conservation, 2015). Overall flight activity was however found to be highly variable between years, with potential confounding influences of differences in habitat features between wind farm sites (e.g. typography), which have not yet been tested.

12.10.6 A further study carried out at the Beinn an Tuirc wind farm, did also identify a decrease in spatial use of the wind farm site during initial years of operational monitoring (Walker *et al*., 2005). Activity through the turbine clusters was recorded and the potential confounding influence of habitat enhancement measures undertaken on adjacent moorland areas as mitigation for the development do not currently allow clear conclusions of wind farm avoidance by the species.

12.10.7 Displacement and loss of habitats for foraging golden eagle could include all land up to 500m from proposed turbines. This would equate to 146.2ha of habitats, which do not already bear displacement effects from turbines associated with the Operational Schemes and Corriemoillie. On review of baseline information, these habitats are not important to the species at this location and should any displacement occur, it would be low magnitude on the Regional NHZ population level and **Not Significant**.

12.10.8 No adverse impact upon the Glen Affric to Strathconon SPA golden eagle population is predicted to occur.

12.11 Mitigation

12.11.1 The mitigation provided within Section 12.254 to 12.260 of the EIA Report remain unchanged.

12.12 Summary of Residual Effects

12.12.1 Residual effects remain unchanged from Section 12.261 in the EIA Report.

12.13 Cumulative Effects

12.13.1 At the request of RSPB, the cumulative assessment has been updated for the Revised Development to include the recently submitted Kirkan Wind Farm.

12.13.2 This section considers the potential for significant effects upon important ornithological features by the Revised Development in combination with the Operational Schemes; Corriemoillie and Kirkan Wind Farms (Table 12.12).

12.13.3 In summary no adverse impacts are predicted for red-throated divers as a result of the Revised Development and as such potential in-combination effects with the above listed wind farm developments would be Negligible and Not Significant at the Regional NHZ population level.

12.13.4 The following cumulative assessment considers the following two main impacts upon ornithological features from wind farm developments:

- Disturbance/Displacement; and,
- Collision Risk Mortality.

12.13.5 Construction activities at the Operational Schemes and Corriemoillie are considered complete. The potential for significant cumulative construction phase effects with these projects are therefore not considered.

12.13.6 As the Revised Development and Kirkan Wind Farm are currently in planning, there is potential for cumulative construction phase effects on ornithological interests depending on the relative timings of construction.

12.13.7 A formal response from RSPB to the Kirkan Wind Farm did not include any objection to the application. No response had been received from SNH at the time of writing (24th September 2019).

12.13.8 Direct habitat loss impacts for all target species is considered to be Negligible for all developments, in the context of remaining suitable habitats for such species within the wind farm sites and immediate surrounding area. As such, a detailed cumulative assessment of potential impacts at the Regional NHZ population scale is not considered necessary.

Table 12.12 Developments considered for cumulative effects.

Lochluichart Wind Farm	
Planning Ref.	05/01052/S36RC
Status	Constructed
No. of Turbines	17
Corriemoillie Wind Farm	
Planning Ref.	13/01082/S42
Status	Constructed
No. of Turbines	17
Lochluichart Wind Farm Extension	
Planning Ref.	13/01082/S42
Status	Constructed
No. of Turbines	17
Kirkan Wind Farm	
Planning Ref.	19/01861/S36
Status	In planning
No. of Turbines	17

Construction and Decommissioning Phase Impacts

12.13.9 Species which may be subject to cumulative effects during the construction phase of the Revised Development and Kirkan Wind Farm include red throated diver and black grouse.

Black Grouse

12.13.10 A single black grouse lek was recorded within the Revised Development and impacts are considered to be Negligible and Not Significant at the NHZ population level.

12.13.11 A total of 15 black grouse leks were recorded in baseline surveys for Kirkan Wind Farm, with impacts considered to be of Low magnitude, and Not Significant at the NHZ population level. The Kirkan Wind Farm included mitigation for black grouse which included no 'potentially disturbing' works within 750m of main lek sites identified prior to 9am between the months of April and May.

12.13.12 As a precaution, a Breeding Bird Protection Plan (BBPP) will be agreed post consent with the local planning authority, to include a preconstruction survey to identify breeding black grouse. Should surveys identify the presence of black grouse in defined buffer mitigation will be adopted. Full details will be included within the CEMP.

12.13.13 Habitat loss was also considered to be of **Negligible** magnitude and **Not Significant** for black grouse from the Revised Development due to the low numbers recorded. No significant effects were also predicted from the proposed Kirkan Wind Farm due to the large availability of nesting and foraging habitats in the surrounding area. No cumulative effects from habitat loss are anticipated. Enhancement provided as part of a HMP for the Revised Development and the proposed Kirkan Wind Farm will deliver new and enhanced foraging and nesting opportunities for black grouse.

Red Throated Diver

12.13.14 Corriemoillie predicted the possibility of one breeding pair being lost due to displacement or collision over the life of the windfarm during operation and the Operational Schemes concluded negligible collision and displacement impacts. Red throated divers were scoped out of detailed assessment from the Kirkan EIA-R.

12.13.15 The potential for operational disturbance to result in actual population losses is difficult to ascertain and quantify with a high degree of certainty. The species is already subject to existing disturbance from the Operational Schemes, therefore the birds are somewhat resilient to the presence of operational turbines in this location. The Revised Development is separated by operational schemes from the divers and therefore highly unlikely to result in cumulative disturbance effects.

12.13.16 Collectively all three consented and operational wind farm developments conclude no more than negligible magnitude impacts upon red throated diver as a result of long-term operational displacement, which would therefore not be significant at the Regional NHZ population level. Any additive and therefore cumulative effect from the Revised Development would be highly unlikely and therefore not be significant at the Regional NHZ population level.

12.13.17 No collision risk estimates are available for the Operational Schemes. The Corriemoillie ES estimated up to one bird every 36.1 years could collide with the turbines based on a 98% avoidance rate. SNHs current position is that the

mortality is very low for the species, with more recent guidance suggesting a 99.5% avoidance rate is more appropriate. The collision mortality is therefore likely to be much lower than previously predicted. During the first two years of operation, there have been no recorded collisions at Corriemoillie or the Operational Schemes.

12.13.18 No additional adverse effects are predicted for red throated diver. Cumulative effects are likely to be **negligible** and **not significant** at the scale of the NHZ.

Disturbance /Displacement

12.13.19 The potential for operational disturbance to result in actual population losses is difficult to ascertain and quantify with a high degree of certainty.

12.13.20 The three currently consented and operational wind farm developments together with proposed Kirkan Wind Farm and the Revised Development are however, established to be located in a locale known to support low breeding population densities of identified key ornithological features (e.g. black grouse, greenshank and golden plover) or of little interest to foraging species (e.g. migratory geese and golden eagle).

12.13.21 Collectively all four projects conclude no more than Low magnitude impacts upon ornithological features as a result of long-term operational displacement, which would not be significant at the Regional NHZ population level. Any additive and therefore cumulative effect from the Revised Development would be highly unlikely and **not be significant** at the Regional NHZ population level.

12.14 Ornithological Enhancement Measures

12.14.1 A HMP will be produced which will include restoration measures of the most sensitive habitats and also provide enhancement of Annex 1 habitats within the Revised Development. The HMP will also include measures to enhance the habitats within the Revised Development for species such as black grouse and red throated diver, including the provision of a diver raft on a suitable loch.

12.14.2 The HMP will include a detailed work programme, method statements for habitat enhancement, reporting mechanisms and a monitoring and review strategy.

12.14.3 The HMP will be prescribed and agreed in consultation with SNH.

12.15 Summary of Effects

12.15.1 No potentially significant impacts upon ornithological features resulting from the Revised Development alone or in-combination are identified.

12.15.2 Mitigation measures to ensure legislative compliance during the construction phase of the development with regards the protection of nesting birds are outlined. Providing implementation, no breach of the provisions of the relevant legislation will occur.

Table 12.13 Summary table of impacts upon the recorded ornithological features.

Feature	Proposed Activity	Characterisation of unmitigated impact upon feature	Significance without mitigation and confidence level	Mitigation and Enhancement	Residual significance and confidence level (following mitigation)
Red-throated Diver	No change.				
Greylag goose	No change.				
Red Kite	No change.				
Hen harrier	No change.				
Golden eagle	No change.				
Osprey	No change.				
Merlin	No change.				
Black grouse	Habitat Loss	No change.			
	Disturbance and Displacement	Likely, temporary.	Negligible, not significant.	Breeding Bird Protection Plan to be agreed within the CEMP.	Not significant
	Operational – displacement	No change.			
Golden plover	No change				
Greenshank	No change				

13. Hydrology

Non-Technical Summary

13.1.1 Chapter 13 of the EIA Report assessed that the Original Scheme as having no significant effects on the hydrological environment.

13.1.2 The removal of access tracks, four turbines and associated hardstanding will reduce the potential of effects on the hydrological environment and the potential for all effects remain not significant in terms of the EIA Regulations.

13.2 Introduction

13.2.1 This chapter address the potential effects of the 5-turbine Lochluichart Wind Farm Extension II (see Chapter 3 for further information, and hereafter known as 'the Revised Development') has on the Hydrology and Hydrogeology resource and supplements Chapter 13: Hydrology, Hydrogeology, Geology and Peat of the 2019 Environmental Impact Assessment Report (hereafter known 'EIA Report') which supported the application for the 9-turbine Lochluichart Wind Farm Extension II (hereafter referred to as 'the Original Scheme'). This chapter should be read in conjunction with the EIA Report.

13.2.2 Chapter 13 of the EIA Report for the Original Scheme assessed that the Development as having no significant effects on the hydrological environment.

13.2.3 The methodology of the EIA Report remain valid and appropriate and therefore have not been reassessed for this Supplementary Information (SI), unless otherwise stated.

13.3 Legislation, Policy and Guidance

13.3.1 The following changes have been made to legislation or planning policy with respect to hydrology, hydrogeology or soils since the EIA Report was prepared:

13.3.2 The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) - Version 8.3 February 2019;

13.3.3 Technical Flood Risk Guidance for Stakeholders - SEPA requirements for undertaking a Flood Risk Assessment - Version 12, May 2019 SS-NFR-P-002; and

13.3.4 Climate change allowances for flood risk assessment in land use planning Land Use Planning System (LUPS-CC1) – SEPA 26 April 2019.

13.3.5 With the exception of the SEPA guidance on climate change allowances, there have been no substantial changes which would alter the conclusions of the EIA Report.

13.4 Assessment Methodology and significance Criteria

13.4.1 The assessment method and significance criteria are the same as detailed in Chapter 13 of the EIA Report.

13.5 Responses and Consultation

13.5.1 Table 13.1 outlines the pertinent consultation responses received in relation to hydrology, hydrogeology and geology.

Table 13.1: Consultation responses relating to Hydrology and Hydrogeology

Consultee	***Date***	***Points Raised***	***Response***
SEPA	***16th April 2019***	SEPA welcome that a National Vegetation Classification survey is presented in Figure 11.2. SEPA note that highly dependent GWDTE have been avoided. SEPA note that the main impacts are likely to be on M15 wet heath, which is considered to have moderate groundwater dependency. SEPA note that Section 13.170 of Chapter 13 – Hydrology, states that "approximately 338.2 ha of M15 exists within the Core Study Area. Approximately 5.82 ha of M15 will be directly lost as a result of infrastructure at the Development being located within this community. Therefore, approximately 1.7 % of this community will be directly lost as a result of the Development. As such, direct hydrological effects will equate to a 'minimal detectable effect on a GWDTE (between to 0.1 % - 5 % of study area) or no discernible effect on its integrity as a feature or its functionality in accordance with Table 13.3. Therefore, the magnitude of the loss M15 will result in a negligible effect." We are therefore satisfied with the mitigation proposed for reducing indirect impacts to the M15 wet heath and other wetland habitats, however, we ask that the Construction Environmental Management Plan (CEMP) is amended to include a dedicated section on this mitigation, which we will then condition with any grant of consent.	*Due to the reduction in hardstanding areas, the direct loss on the M15 community will decrease but will still constitute a negligible effect.* *The WCEMP included a specific section on measures to limit the potential for direct and indirect effects on GWDTEs (see Section 8.2).*
SEPA	***16th April 2019***	SEPA welcome that a National Vegetation Classification survey is presented in Figure 11.2. SEPA note that highly dependent GWDTE have been avoided. SEPA note that the main impacts are likely to be on M15 wet heath, which is considered to have moderate groundwater dependency. SEPA note that Section 13.170 of Chapter 13 – Hydrology, states that "approximately 338.2 ha of	*The Revised Development will result in the loss of 2.80 ha of M15. This equates to 3.02 ha less directly impacted M15 than as set out in the EIA Report.*

		M15 exists within the Core Study Area. Approximately 5.82 ha of M15 will be directly lost as a result of infrastructure at the Development being located within this community. Therefore, approximately 1.7 % of this community will be directly lost as a result of the Development. As such, direct hydrological effects will equate to a 'minimal detectable effect on a GWDTE (between to 0.1 % - 5 % of study area) or no discernible effect on its integrity as a feature or its functionality in accordance with Table 13.3. Therefore, the magnitude of the loss M15 will result in a negligible effect." We are therefore satisfied with the mitigation proposed for reducing indirect impacts to the M15 wet heath and other wetland habitats, however, we ask that the Construction Environmental Management Plan (CEMP) is amended to include a dedicated section on this mitigation, which we will then condition with any grant of consent.	
SEPA	***16th April 2019***	SEPA welcome that the management of sediment and surface waters has been addressed within the Outline Water Construction Environmental Management Plan (WCEMP, Appendix 13.A); however, the information is not site specific. We now expect developments to produce site specific maps showing cut off ditches to prevent clean surface water entering the construction site and proposed locations of Sustainable Urban Drainage Systems (SuDS) features (lagoons, cut off drains, discharges to vegetated buffers, check dams etc), demonstrating where they will be directed, and how polluted water will be treated and where clean water will be re-directed. This site plan must also clearly show how polluted surface water is kept away from the water environment.	*It is considered that the information produced within the outline WCEMP is sufficient to inform the assessment of potential effects on the hydrological environment.* *The detailed design, including location maps, will be produced by the appointed contractor as part of a Construction Site Licence which will be required prior to the construction phase of the Development.*
SEPA	***16th April 2019***	SEPA note that Plate 2: Typical Silt Traps contained within the CEMP appears to demonstrate a failed silt trap, and it is not clear what value it is adding to the protection of the	*It is acknowledged that the silt trap shown in Plate 2 of the WCEMP has not been built to industry standards. A replacement image has*

		water environment. Geotextile material silt fences or straw bales should not be used to filter water, but should be used to keep sediment on the construction site and away from watercourses. Any plans which solely reply [sic] on geotextile material or straw bales to filter polluted water should therefore be redesigned. We therefore must object until a comprehensive site plan(s) is produced to demonstrate the function and location of all planned SuDS features during construction, which clearly demonstrate that suitable mitigation will be applied throughout the entirety of the site. This will also aid site contractors in identifying exactly what needs to be designed into order to prevent pollution of the water environment.	*been included in the WCEMP provided in Appendix 13.A of this SI.* *The Arcus Hydrology team do not advocate the use of a silt trap as a pollution prevention measure. This view has been informed by several discussions with representatives of SEPA since 2009 and we have witnessed their ineffectiveness on construction sites.* *Similarly, Arcus do not advocate the use of permeable material for silt fences as the primary function of these measures is to trap silt laden water behind the fences and allow water to infiltrate, leaving sediment on the surface.* *The Outline WCEMP has been updated to reflect this.* *Given the modest number of turbines compared to other wind farm developments, we reiterate the point that a detailed, site-wide SuDS and pollution prevention plan will be produced by the construction contractor and this should form part of an appropriately worded planning condition.*
Scottish Water	16th April 2019	A review of Scottish Water records indicates that there are no Scottish Water drinking water catchments or water abstraction sources, which are designated as Drinking Water Protected Areas under the Water Framework Directive, in the area that may be affected by the proposed activity.	*No action required.*
THC Flood Risk Management Team	9th May 2019	The Flood Risk Management Team has reviewed the information provided by the applicant and has no objection to the application subject to	*No action required.*

		the following conditions being applied:	
THC Flood Risk Management Team	9th May 2019	Having reviewed the Environmental Statement, The Flood Risk Management Team accepts that flood risk on the site can be managed adequately. A buffer strip of 50m has been provided between all infrastructure and the watercourses on the site. The Flood Risk Management Team would request that this is made a condition.	*The 50m buffer of watercourses has been maintained for the Revised Development.*
THC Flood Risk Management Team	9th May 2019	A number of watercourse crossings are required on the site. The Flood Risk Management Team would request a condition that final crossing designs are submitted for review and approval. The Flood Risk Management Team would expect all major watercourse crossings to be designed to convey the 1 in 200 year plus climate change (20%) flood.	*Watercourse crossings will be designed during the detailed design phase. Given the recent SEPA guidance on climate change allowances we recommend that an uplift of 37 % is applied to the 1:200 year flow rate, in accordance with Table 1: Peak river flow allowances by River Basin Region "North Highland" scenario of LUPS-CC1.*
THC Flood Risk Management Team	9th May 2019	The Flood Risk Management Team would welcome the use of SuDS and Natural Flood Risk Management within the development and would request that these are adopted as set out in the Environmental Statement. The Flood Risk Management Team would request a condition that the drainage plans are submitted for review and approval.	*This is acknowledged and the SuDS principles outlined in the CEMP remain valid to inform this chapter.*
THC Flood Risk Management Team	9th May 2019	Tracks within the site should not act as preferential pathways for runoff. We accept the proposals for managing the drainage of the access tracks and would expect these to be fully implemented during construction.	*Access tracks will be constructed as outlined in the CEMP and surface water managed by SuDS.*

13.6 Baseline Conditions

13.6.1 The Core Study Area is the same as the EIA Report and no development is proposed outside of the areas previously assessed.

13.6.2 There have been no changes to land use and no substantial changes to the hydrological regime associated with the Revised Development.

13.6.3 It is considered that receptors identified as having High sensitivity in the EIA Report remain the same and these include groundwater and private water supplies.

13.7 Assessment of Potential Effects

13.7.1 A full description of the Revised Development layout is provided in Chapter 3. The following revisions are of relevance to hydrology, hydrogeology and geology: the removal of Turbine 2, 3, 9 and 10 and associated new access tracks and crane hardstandings. Relocation of Turbine 4 by approximately 24 m. The removal of the need of one crossing of Allt na Beinne Leithe Bige. The removal of a spur track from Turbine 6 to the operational scheme.

13.7.2 All other infrastructure remains the same as the EIA Report, including the re-use of the existing access track and watercourse crossing to access the operational Lochluichart Wind Farm.

13.7.3 No new development is proposed in areas of the Revised Development that have not been previously assessed in terms of hydrology, hydrogeology and peat.

13.7.4 As such, there is reduced potential for the following effects compared to the layout presented in the EIA Report: chemical pollution; sedimentation; groundwater and near surface water interflow/near surface water flow; impediment to flow; compaction of soils; increase in runoff and flood risk; effects on the hydrological function of wetland habitats; acidification of watercourses; and effects on peat.

13.7.5 Specifically, the removal of infrastructure reduces the direct loss of Ground Water Dependent Terrestrial Ecosystems (GWDTEs) communities including 2.80 ha of M15.

13.7.6 As outlined previously, SEPA have recently published an update to the proposed climate change allowances to be applied to fluvial flows and rainfall intensities. As such, new watercourse crossings should be designed to accommodate the 1:200 year flow plus a 37% increase to account for climate change. This is considered to be achievable through the detailed design phase and does not alter the assessment conclusions in paragraphs 13.186 to 13.191 of the EIA Report which states that potential effects associated with watercourse crossings (impediments to flow) would be negligible and not significant in accordance with the EIA Regulations.

13.7.7 Similarly, potential effects during the operational and decommissioning phases are considered to be reduced as a result of the Revised Development, and are also not significant in accordance with the EIA Regulations.

13.8 Assessment of Cumulative Effects

13.8.1 One large-scale construction project has been identified within the wider 10 km study area since the submission of the EIA Report. Kirkan Wind Farm - up to 19 turbines, approximately 1.5 km east of the Development, located within the catchment of Glascarnoch River.

13.8.2 The greatest potential for cumulative effects arises when the construction phase of another development overlaps with the construction phase of the Revised Development. Cumulative effects are considered to have the potential to be significant only where such an overlap may exist, as activities that could be potentially detrimental to the hydrological environment are greatly reduced during the operational phase of developments (*e.g*. excavation works, concrete pouring *etc*.).

13.8.3 Assuming commencement of the construction of the Revised Development in 2020, lasting for approximately 12 months, this is likely to coincide with the construction phase of Kirkan Wind Farm and therefore, there is likely to be potential for cumulative effects between the developments.

13.8.4 Given their respective locations, the primary cumulative effect is likely to be an increase in flow rates associated with increased run-off from new hardstanding areas and the potential for chemical / sedimentation effects from the two wind farm developments.

13.8.5 The increase in flow rates is considered to be of negligible magnitude for the Revised Development.

13.8.6 It is assumed (as outlined in Chapter 8 of the EIA Report for Kirkan Wind Farm) that water management measures will be implemented at Kirkan Wind Farm, similar to those described in the Outline WCEMP for the Revised Development, as these are in line with standard practice as required by SEPA. Given this, the magnitude of cumulative effects during the construction phase will be negligible and, therefore, of negligible significance.

13.8.7 This is not significant in terms of the EIA Regulations.

13.8.8 The conclusion of the original cumulative assessment, which stated that with construction good practice there would be no significant effects, remains valid.

13.9 Mitigation Measures and Residual Effects

13.9.1 No additional mitigation is proposed as a result of the Revised Development.

13.9.2 The embedded development design, such as 50m buffers of watercourses and the measures outlined in the Outline WCEMP, remains appropriate to limit the potential for hydrological effects.

13.9.3 Therefore, the conclusions of the EIA Report that there will be no significant residual effects from the Original Scheme remain valid.

13.10 Summary

13.10.1 The Revised Development would not increase the significance of effects assessed in the EIA Report in terms of hydrology, hydrogeology and peat.

13.10.2 The Revised Development reduces the amount of new access track, the number of turbines and associated hardstanding and removes the requirement of one new watercourse crossing, and less peat and peaty-soil will be disturbed as a consequence.

References

Scottish Government (2018) The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) [Online] Available at: https://www.sepa.org.uk/media/34761/car_a_practical_guide.pdf (Accessed 30/07/19)
SEPA (2019) Technical Flood Risk Guidance for Stakeholders - SEPA requirements for undertaking a Flood Risk Assessment [Online] Available at: https://www.sepa.org.uk/media/162602/ss-nfr-p-002-technical-flood-risk-guidance-for-stakeholders.pdf (Accessed 30/07/19)
Kirkan Wind Farm: EIA Report, Vol. 1 – RSK (2019). [online] Available at: https://coriolisv3.opendebate.co.uk/files/kirkan/Volume%201%20-%20Main%20Text.pdf (Accessed 31/07/2019).

14 Shadow Flicker and Safety

14.1 A Review of the Revised Development in relation to Shadow Flicker & Safety has been undertaken. Following submission of the EIA Report, no objections were raised in relation to the Original Scheme. The removal of 4 turbines and related infrastructure will not alter these findings.

14.2 **Statement of Significance**

Effects on Shadow Flicker and Safety associated with the Revised Development are considered to be not significant.

15 Infrastructure

15.1 A Review of the Revised Development in relation to Telecommunications, Utility infrastructure, Aviation, and Radar has been undertaken. Following submission of the EIA Report, an objection from HIAL was raised in relation to the Original Scheme. With the submission of additional information (refer to Appendix 15.A) to HIAL which satisfies their concerns (refer to Appendix 15.B), HIAL have confirmed that no objection will be raised.

15.2 **Statement of Significance**

Effects on Telecommunications, Utility infrastructure, Aviation, and Radar associated with the Revised Development are considered to be not significant.

16 Forestry

16.1 A Review of the Revised Development has been undertaken. Following submission of the EIA Report, SEPA objected on the grounds that mulching of unmerchantable timber was proposed in the Original Scheme. The applicant has included a response to this objection, which can be found in Appendix 16.A.

16.2 The reduction in the scale of the scheme of the Revised Development, removing 4 turbines and related infrastructure, will result in a reduced requirement for Compensatory Planting to 3.63 hectares for the Revised Development. This equates to 0.7% of the existing forestry area.

16.3 **Statement of Significance**

Effects on Forestry associated with the Revised Development are considered to be not significant.