

Strathy South Wind Farm

Further Information Report (T39 Layout)

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On behalf of:
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	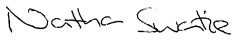
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1 Introduction

In 2007, SSE Generation Limited (hereafter referred to as 'the Applicant') submitted an application to the Energy Consents and Deployment Unit (ECDU) of the Scottish Government (07/00263/S36SU) for consent under section 36 of the Electricity Act 1989 (and deemed planning permission), for a wind farm known as Strathy South, located near Strathy, in Sutherland (hereafter referred to as the Original 2007 Scheme).

An Environmental Impact Assessment (EIA) was undertaken in relation to the proposed wind farm in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (the 'EIA Regulations'), as amended, and an Environmental Statement (hereafter referred to as 'the 2007 ES') was submitted alongside the application. The 2007 application remained undetermined pending receipt of additional information as requested by stakeholders in relation to a number of specific matters arising through the application consultation process.

To address these matters and to further reduce environmental impact, the Applicant made modifications to the Original 2007 Scheme and, in September 2012, confirmed its intention to produce an ES Addendum for the modified scheme (hereafter referred to as 'the Modified 2013 Scheme'). Therefore, an ES Addendum was prepared on behalf of the Applicant by SSE Renewables Developments (UK) Ltd to address the issues raised by consultees and to report on the changes to the environmental assessment resulting from the modifications made to the scheme. Much of the assessment reported within the 2007 ES was still relevant to the Modified 2013 Scheme. The 2013 ES Addendum chapters reported how the modifications to the Original 2007 Scheme affected the conclusions of the 2007 ES (if at all).

The 2013 ES Addendum was submitted to ECDU in July 2013 and the Modified 2013 Scheme layout is presented in Figure 1.1 of this report. Further consultation has been undertaken with the consultees following submission, in particular with The Highland Council (THC), Scottish Natural Heritage (SNH) and the Ministry of Defence (MoD) as summarised in Section 3: Consultation (refer to Table 3.1 of Technical Appendix 5.2 for further detail).

Having considered the 2013 ES Addendum, SNH's previous objections to the original 2007 Strathy South application on habitats and non-avian protected species have been resolved.

Furthermore, SNH has now confirmed that subject to deletion of seven turbines from the 2013 Modified Scheme (as assessed in the 2013 ES Addendum), there are only two bird species over which it has remaining concerns (red-throated diver and greenshank). These concerns arise from issues SNH has regarding the perceived uncertainty over the wind farm's predicted effects on these species.

The deletion of 3 turbines which coincide with those requested by SNH and one additional turbine enabled the MoD to withdraw its objection. As a result, there are no other objections from any statutory consultee, other than SNH concerns over the prediction of effects on red-throated diver and greenshank, in relation to which objections are maintained.

THC considered the proposals at its North Planning Application Committee on 10 June 2014. The planning officer's recommendation was *"Raise no objection (subject to the removal of 8 turbines)".* Furthermore, the report concludes *"There are some significant adverse impacts to taken into account with the application, but the development is also considered to be acceptable on many of the specific criteria set out in the Development Plan. The impact of the project is also reversible in that permission is being sought for a period of*

25 years after which time the infrastructure can be removed and the site largely restored to open moorland. The removal of over 1,000 ha of non-native woodland and significant peat land restoration is seen as a significant benefit. The application is one that can be seen as being located and sited such that it will not be significantly detrimental overall, either individually or cumulatively with other operational onshore wind farms. The application, with the exception of the matters highlighted above (SNH objection re the SPA on two bird species) is one which is seen to otherwise accord with the policies of the Council's Development Plan. The application is therefore one which on a planning balance basis should be supported."

Following this, against officer recommendation, the Committee nevertheless determined that THC's response to this consultation was *"to object to the application on the basis of the concerns highlighted in the objections raised by Scottish Natural Heritage, thereby the proposal was contrary to the Council's Highland-wide Local Development Plan, Policies 57 (Natural, Built and Cultural Heritage) and 67 (Renewable Energy)."* Thus the THC objection rests upon the objection from SNH in relation to red-throated diver and greenshank.

The Applicant confirmed to ECDU in July 2014 that it wished Scottish Ministers to move to determination of the application which will necessitate, under the terms of Paragraph 2(2) of Schedule 8 to the Electricity Act 1989, Scottish Ministers to call a public inquiry. In the meantime, the resolution of SNH concerns has been the subject of detailed discussion between the Applicant and SNH. As confirmed in correspondence from the Applicant's planning consultants to the Directorate for Planning and Environmental Appeals, the Applicant has reduced the scale of the project by eight turbines and is now seeking consent for a 39 turbine wind farm (as shown in Figure 1.2:T39 layout). By email dated 31st October 2014 the Reporter appointed by Ministers to hold a public inquiry requested further information in respect of the reduction in turbine numbers under regulation 13 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000.

This Further Information Report responds to that request and consists of a summary of the changes to the project and any consequential changes to the assessment of environmental effects, together with revised ornithological information, an updated cumulative landscape and visual assessment and carbon balance calculation.

2 Structure of Report

This report is structured as follows:

- Section 3: Consultation gives a summary of the consultation that has led to the request for the removal of turbines (refer to Table 3.1 of Technical Appendix 5.2 for details of the consultation with SNH).
- Section 4: Development Description provides an overview of the proposed development and describes elements of the proposals where amendments have been made as a result of the reduction in turbine numbers.
- Section 5: Effects of Design Change on Conclusions of 2013 ES Addendum provides a review of the environmental effects as a result of turbine deletions where a difference occurs between the Modified 2013 Scheme (assessed in the 2013 ES Addendum) and the T39 Layout.

3 Consultation

Since the 2013 ES Addendum was submitted in July 2013, there has been ongoing consultation with a variety of statutory and non-statutory consultees. SNH and MoD both raised objections to the Modified 2013 Scheme but requested deletion of certain turbines to resolve specific matters.

The MoD raised objections in relation to the wind farm being located within an area where low flying operations take place. The MoD identified Turbines 68, 73, 74 and 76 as being the cause of its objection and confirmed (in its letter dated 2nd September 2013) that if these turbines were deleted from the project, this would remove the obstruction to an extent whereby the MoD would have no reason to object to the proposal. As shown on Figure 1.2: T39 Layout, the turbines in question have been removed from the proposed development.

SNH raised objections in relation to both the Caithness and Sutherland Peatlands SPA and SAC as set out in a letter dated 20th November 2013, as follows:

- Qualifying species the Caithness and Sutherlands Peatlands SPA: red throated diver, greenshank, golden eagle, hen harrier, black throated diver and the wood sandpiper.
- Qualifying features of the Caithness and Sutherlands Peatlands SAC: habitats and otters.

Through further consultation, further clarification provided to SNH and the removal of turbines, most of the objections outlined above have been resolved. The remaining two objections relate to red throated diver and greenshank.

A detailed summary of all consultation undertaken with SNH Is provided in Table 3.1 of Technical Appendix 5.2 of this report.

4 Development Description

The proposed development consists of the following key elements:

- Wind turbines.
- Foundations and hard standing.
- Access track and site tracks.
- Stream crossings.
- Cabling.
- Anemometer masts.
- Control building/Switching station.
- Welfare building.
- Lay down areas.
- Borrow pits.

Those elements of the proposals where amendments are made as a result of the reduction in turbine numbers are described in the paragraphs below. Figure 1.2 shows the T39 layout and associated infrastructure.

4.1 Turbines

The T39 Layout would see the removal of eight turbines from the Modified 2013 Scheme: T51, T55, T62, T63, T68, T73, T74 and T76 (Figure 1.2).

The National Grid References (NGR) for the turbines proposed for retention are presented in Table 4.1.1.

Table 4.1.1: Turbine Locations

Turbine Number	X Co-ordinate	Y Co-ordinate
1	280619	953031
2	281155	952737
4	280687	952437
6	281205	952237
8	280675	951871
9	281141	951618
10	280139	951650
11	280653	951295
13	280144	951050
15	281058	950872
17	280598	950707
18	281049	950334
19	280030	950461
20	280413	950162

Table 4.1.1: Turbine Locations		
Turbine Number	**X Co-ordinate**	**Y Co-ordinate**
22	279973	949829
24	280781	949792
26	280279	949361
28	279786	949085
29	279022	950112
30	279413	949703
33	279165	949159
35	277397	949254
36	278217	949225
39	277866	949638
41	277431	949983
42	278375	949964
43	278763	949581
45	278263	950529
46	278855	950613
49	277856	951064
47	278555	951001
50	278264	951400
52	277806	951652
57	278737	951687
56	278297	951962
61	279119	952086
69	278372	953507
70	278683	953059
72	279165	953538

As set out in Section A4.2.4: Micrositing of Chapter A4: Development Description, it is proposed that an allowance of up to 50 m would be permissible for turbines and infrastructure.

Turbine parameters would remain unchanged:

- maximum tip height 135 m;
- maximum modelled rotor diameter 104 m; and
- maximum modelled hub height 83 m.

4.2 Turbine Foundations and Hardstanding

Figure A4.4 of the 2013 ES Addendum presented the typical turbine foundation and hardstanding land takes. Temporary infrastructure land take (per turbine) would be 0.098 ha and permanent land take (per turbine) would be 0.122 ha. Therefore, the reduction in turbine numbers from 47 to 39 would see an overall reduction in land take associated with the turbine foundations and hardstanding as follows:

- Temporary land take: 4.606 ha to 3.822 ha.
- Permanent land take: 5.734 ha to 4.758 ha.

4.3 Tracks

The 2013 ES Addendum presented two route options referred to as the 'preferred' and 'alternative' route. Following the submission, the Applicant has continued to consult with Eon, who have submitted an S36 application for Strathy Wood. It has been agreed that Eon and the Applicant would share one access through Strathy Wood and therefore the alternative access route would be used (Figure 4.1[1]). Therefore the site access is described as in the following paragraph.

A section of the main 'access' track route, between the A836 public road and the most southerly part of the Strathy North wind farm (NGR NC794 569, consented and constructed) is common to both the proposed Strathy South wind farm and the consented Strathy North wind farm. However, the access route for the Modified 2013 Scheme then diverts from that identified in the 2007 ES, travelling south. The alternative access route leaves the consented Strathy North track at NGR 813 564 and travels in a roughly easterly then southerly direction, crossing the River Strathy in Strathy Wood at approximate NGR 818 558. Shortly after the river crossing, the route reaches the existing track and continues in a southwesterly direction before heading in a southerly direction along an existing track for approximately 2 km to reach the site.

With the reduction in turbine numbers there has also been a reduction in the on-site track lengths. Table 4.3.1 presents the access and on-site track for the Modified 2013 Scheme and the T39 Layout. Table 4.3.1 distinguishes between 'cut' and 'float' track construction methods based on the assumption that tracks would be constructed using the 'cut' method where underlying peat is up to 1 m deep and would be constructed using the 'floating' method where peat is deeper. As shown by Table 4.3.1, the total track length would reduce by approximately 5.8 km.

The cable routes indicated in the Modified 2013 Scheme have not changed.

[1] Note that Figure 4.1 shows the Modified 2013 Scheme layout. Refer to Figure 1.2 for the proposed T39 Layout.

Table 4.3.1: Access Track and On-site Track Lengths for the Modified 2013 Scheme and the T39 Layout			
Track Description	**Cut or Floating Track**	**Modified 2013 Scheme[2]**	**T39 Layout**
		Length of Track Section (km)	**Length of Track Section (km)**
Access Track (including 'alternative bridge crossing of the River Strathy)	Cut	0.311	0.311
	Floating	1.575	1.575
	Existing / Upgrade	3.168	3.168
On-site Track (i.e. tracks within the redline boundary of the main site)	Cut	12.226	10.622
	Floating	9.611	8.463
	Existing / Upgrade	10.954	7.828
Total Track Length		**37.845**	**31.967**

4.4 Stream Crossings

Due to the reduction in on-site tracks, the number of stream crossings has fallen from 18 for the Modified 2013 Scheme to 15. Table 4.4.1 below presents the watercourse crossings proposed for the Modified 2013 Scheme and those that have been retained for the T39 Layout.

Table 4.4.1: Stream Crossings for the Modified 2013 Scheme and the T39 Layout		
Modified 2013 Scheme		**T39 Layout**
Watercourse Crossing Number[3]	**Co-ordinate**	
1	281146 955508	**Removed**
2	281304 953931	Retained
3	281878 955835	Retained
4	280739 952708	Retained
5	280178 952030	Retained
6	280432 949494	Retained
7	280807 951395	Retained
8	279176 949171	Retained
9	280171 950019	Retained
10	279722 949723	Retained
11	279101 949512	Retained

[2]Figures as reported in Table A4.3 of Chapter A4: Development Description

[3] The watercourse crossing locations are presented in the 2013 ES Addendum, Volume 3: Figures, Figure A14.2.

Table 4.4.1: Stream Crossings for the Modified 2013 Scheme and the T39 Layout		
Modified 2013 Scheme		**T39 Layout**
Watercourse Crossing Number[3]	**Co-ordinate**	
12	278929 950103	Retained
13	278505 949620	Retained
14	277693 949210	Retained
15	278763 950282	Retained
16	279354 952339	Retained
17	277791 952663	**Removed**
18	277459 953184	**Removed**

4.5 Anemometers

Four permanent anemometry masts were proposed as part of the Modified 2013 Scheme (Figure 1.1). However, with the removal of turbines it is proposed that that the permanent anemometry mast located in the northwest part of the site is removed, reducing the total number of permanent anemometry masts required to three.

This means that no wind farm infrastructure will would be installed inside the northwest section of the red line boundary, leaving this entire area available for full habitat restoration (refer to Section 4.2 of Technical Appendix 5.2 for further information).

4.6 Design Evolution since the 2013 ES Addendum

Following additional consultation, as described in Section 3 of this report, the number of turbines has been reduced from 47 to 39, resulting in a maximum capacity output of 132.6 MW compared to 159.8 MW for the Modified 2013 Scheme. The turbines listed below were removed for the following reasons:

- T51 has been removed to mitigate effects on wood sandpiper.
- T55, T62 and T63 have been removed to mitigate effects on breeding black-throated diver.
- T68, T73, T74 have been removed for two reasons: to mitigate effects on breeding black throated diver and on low flying military aircraft.
- T76 has been removed to mitigate effects on low flying military aircraft.

4.7 Construction Details

The information presented under Section A4.4: Construction of the Chapter A4: Development Description remains largely unchanged, with the exception of traffic (see section 5.10 of this report for more details).

4.7.1 Construction Traffic

Construction traffic is discussed in Section 5.10 of this report.

4.8 Operation

The 2007 ES stated that each turbine would be subject to approximately eight man-days of maintenance per year. With the reduction in turbine numbers the total number of man-days per year required for routine maintenance would decrease from 376 for the Modified 2013 Scheme to 312 for the T39 Layout.

4.9 Design Management and Best Practice

4.9.1 Peat Management

A Peat Management Plan (PMP) was prepared to support the 2013 ES Addendum and included in Volume 4: Technical Appendices, Technical Appendix TA A4.3: Peat Management Plan. The PMP provides details of the predicted volumes of peat that would be excavated on the site, the characteristics of the peat that would be excavated and how the excavated peat would be reused and managed. A revised PMP has been prepared to provide details of the predicted volumes of peat that would be excavated under the T39 Layout (Technical Appendix 4.1). As expected, excavated peat volumes have decreased when compared to that required for the Modified 2013 Scheme. Table 4.9.1 below presents the estimated reduction in excavated peat volumes between the Modified 2013 Scheme and the T39 Layout.

All peat management and peat re-instatement issues would be clearly set out within the CEMP for the site. The CEMP will detail appropriate storage methods for excavated peat (heights and material segregation) to ensure that the excavated peat would be appropriate for re-use during the re-instatement phase at the end of the project.

Table 4.9.1: Excavated Peat Volumes[4]

	Modified 2013 Scheme	**T39 Layout**	**Peat Excavation Reduction (m^3)**
Total Excavated Peat from Tracks and Ditches (m^3)	139,170	118,748	20,422
Total Excavated Peat from Turbine Bases (m^3)	105,071	89,023	16,048
Additional Excavated Peat on Site (Hardstandings and Switching Room) (m^3)	40,097	34,589	5,508
Total Volume of Peat Re-used on Site (m^3)	**284,338**	**242,359**	**41,979**

A Peat Balance was prepared and included in the 2013 ES Addendum in Volume 4: Technical Appendix TA A4.4: Carbon Calculator. Due to the reduction in turbine numbers and access tracks, a revised peat balance for the T39 Layout has been estimated using the latest version of the carbon calculator[5] (Technical Appendix 4.2 of this report). The peat

[4] Figures have been rounded up for ease of reporting.

[5] Version 2.9.1.0 (application version) (April 2014) from the Scottish Government website -

balance of the T39 Layout is slightly decreased when compared to the Modified 2013 Scheme. The carbon payback time of for the T39 Layout is calculated by comparing the loss of Carbon from the site due to the proposed development with carbon savings achieved by the wind farm while displacing electricity generated by coal-fired capacity or grid mix. The effects of the change in site layout on carbon payback periods are discussed in detail in Section 5.10.1 below.

As for the 2013 ES Addendum, an assessment of forestry has been excluded from the calculations as previously agreed with SEPA[6], originally for the Modified 2013 Scheme.

4.9.2 Forest Removal

Whilst some turbines have been removed from the site layout it is still proposed to remove the full, non-native commercial forestry plantation in line with the strategy set out in A4.8.3: Forest Removal of Chapter A4: Development Description.

http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-sources/19185/17852-1/CSavings/CC2-9-0

[6] Email from Susanna Sebastian to ENVIRON dated 08/07/13

5 Effects of Design Change on Conclusions of the 2013 ES Addendum

5.1 Introduction

The purpose of this section of the report is to provide an understanding of how the environmental effects arising from the T39 Layout compare with those described in the 2013 ES Addendum for the Modified 2013 Scheme. In addition, this section provides consideration of the cumulative effects in relation to relevant cumulative wind farms.

5.2 LVIA

The T39 Layout incorporates changes which have the potential to alter impacts assessed and presented in Chapter A8: Landscape Character and Chapter A9: Visual Assessment of the 2013 ES Addendum. A review of potential effects was therefore undertaken to report the implications of these changes and is presented in full in Technical Appendix 5.1 of this report. The following paragraphs provide a summary of the findings from this review.

The study area for landscape character was unchanged from earlier assessments. The viewpoints included were also those studied previously. Potential cumulative effects were reviewed and, following consultation with THC, it was agreed that three cumulative viewpoints included in the 2013 ES Addendum would be reviewed, with an additional cumulative viewpoint at Ben Griam Beg.

For designated landscape areas, when comparing zone of theoretical visibility (ZTV) diagrams for the Modified 2013 Scheme and the T39 Layout, at one of the three Special Landscape Areas, the T39 Layout would result in no change to the extent of area potentially affected. At the other two areas, the T39 Layout would result in minor reductions in the extent of designated area potentially affected. These changes are so small that assessed impact on designated landscape areas within the study area would therefore be unchanged as a result of the proposed T39 Layout.

When reviewing landscape character zones (LCZs), a comparison of ZTVs for the Modified 2013 Scheme and the T39 Layout found that a reduction in the extent of areas potentially affected would result at all of the LCZs as a result of the proposed reduction in turbine numbers. Changes would generally be minor but the most notable reductions would be at the Upland Plateau with Raised Bogs LCZ and the Strathnaver LCZ.

In the case of the Upland Plateau with Raised Bogs LCZ, reductions in affected extent would occur in small areas throughout. However, there would be no change in the assessed potential impact. At the Strathnaver LCZ, there would be a reduction in the extent potentially affected but not the proposed development's noticeability overall. There would be no change in assessment at this location. Impact on LCZs would therefore be unchanged from the 2013 ES Addendum as a result of the T39 Layout.

The review of viewpoints found that, at the majority, there would be some change (usually improvement) in visual composition but that this would be insufficient to alter the assessed level of impact.

From Bettyhill Viewpoint (VP9), changes would lead to a reduction in potential post-construction impact when compared to the Modified 2013 Scheme: from Moderate-Substantial to Moderate. There would be no change in the impact during construction. From Syre Lodge (VP16), there would be no visibility of the T39 Layout. Impacts at this

location, during construction and operation, would therefore change from Negligible to No View.

For potential cumulative impacts, a review of the status of sites included in the 2013 ES Addendum CLVIA was undertaken in August 2014. However, having reviewed the proposed locations for these sites, the majority would potentially add to existing clusters of development. Therefore, it is considered unlikely that these would significantly alter the potential impacts associated with the existing clusters which have previously been identified and assessed.

Following consultation with THC, focus for the cumulative impact review was therefore on the design changes in relation to neighbouring wind farm sites. This was done using VP1 (Ben Griam Beg), VP4 (Strathy), VP9 (Bettyhill Viewpoint) and VP13 (East of Melvich) and showing turbines at Strathy North and Strathy Wood Wind Farms.

When comparing the cumulative viewpoints included in the 2013 ES Addendum, it was found that there would be no change in the predicted cumulative effects and there would be no significant cumulative effects at any of the cumulative viewpoints reviewed. At the new cumulative VP (Ben Griam Beg), it was found that cumulative effects would not be significant.

5.3 Ecology

The scope of this 2014 FIR, focuses on differences between the Modified 2013 Scheme and the T39 Layout. All of these changes occur within the turbine areas. No changes have been proposed (in description and impact) to the 'alternative' access track described in Chapter A10: Ecology, Section A10.1.3: Study Area of the 2013 ES Addendum, which has been selected for use (Section 4.3 of this report). As a result, the access track is not considered further in this report.

5.3.1 Impacts to be Assessed

All Valued Ecological Receptors (VERs) identified in the 2007 ES, and subsequently re-examined in the 2013 ES Addendum remain relevant with the exception of freshwater pearl mussel, bats and deer, as detailed in Chapter A10: Ecology, Section A10.1.6: Impacts Scoped Out of the Assessment of the 2013 ES Addendum. As with the 2013 ES Addendum, groundwater dependant terrestrial ecosystems (GWDTEs) are re-assessed.

5.3.2 Revised Impacts on Habitats and Vegetation

An updated assessment has been carried out as a result of the changes in land take due to the reduction in turbine numbers, site track and met masts and the resulting change to effects on habitats.

Habitat loss and direct and indirect habitat impact calculations (presented in Table 1 in Technical Appendix 5.3) have been updated in response to the T39 Layout, using the same precautionary methodology presented in Chapter A10: Ecology, Section A10.5.2 of the 2013 ES Addendum. Phase 1 Habitat figures were updated in the 2013 ES Addendum (Figure A10.3) along with figures showing the NVC habitats present within the site boundary (2013 ES Addendum Figures A10.4 and A10.5). This data has been used as the basis for this assessment.

Landtake figures were subsequently updated by RPS due to further work undertaken in early 2014. Following finalisation of a land management agreement, implementation of grazing

management has been secured over an additional 1,306 ha of land in the Caithness and Sutherland Peatlands SPA, within which two areas of search have been identified for additional drain blocking, comprising Peat Restoration Search Area A - 115.4 ha or Peat Restoration Search Area B - 89.9 ha. These latter measures will be of additional potential benefit to greenshank by increasing the extent of wetland habitat

Designated Sites

The turbine reductions and reductions in roads and watercourse crossings are not within designated areas, so the impact on these areas with respect to habitat loss remains unchanged from the 2013 ES Addendum (Low and the overall affect as Minor (Not Significant)).

Outwith Designated Sites

Tables 1 and 2 in Technical Appendix 4.3 of this report show the estimated habitat loss and impacts from the T39 Layout infrastructure within the main wind farm area (non-SAC habitats).

As set out in Table 2 in Technical Appendix 5.3, the total predicted habitat loss and direct/ indirect impacts (10 m buffer) within the main wind farm area for the Modified 2013 Scheme is 77.92 ha; for the T39 Layout this reduces to 66.87 ha, a decrease of 14.17%.

Taking into account the area of overall impact on these habitats, and the forestry setting in which they are found, the magnitude of effect is assessed as Medium, as was the case in the 2013 ES Addendum. The overall effect of impacts on habitats is therefore assessed as Moderate (Significant), without any mitigation.

Long-term plans for peatland restoration and management proposals to restore the area occupied by non-native, commercial forestry of 1,000 ha remains unchanged as outlined previously in the 2013 ES Addendum (Chapter A10: Ecology, Section A.10.5.2). This presents an opportunity to create a significant net environmental benefit in terms of peatland habitats.

5.3.3 Revised Impacts on Fauna

The predicted construction, operational and ongoing effects on protected species remain as outlined in Chapter 10: Ecology, Section 10.6.3: Impacts on Fauna of the 2007 ES and are summarised as follows:

- Otter: The reduced number of watercourse crossings reduces the potential effects on otters and their habitats across the site. Therefore the overall effect is considered to be Not significant.
- Pine Marten: It is expected that the site would remain generally unsuitable for pine martens; however, the removal of forestry would have the potential to remove suitable habitat for the species. Taking into consideration their presence within the wider area the overall effect is considered to be Not Significant.
- Wildcat: No signs of wildcat were found during the 2012 survey, however, areas of potential suitable habitat are located within the site so the species cannot be ruled out completely and pre-construction surveys should be undertaken to specially assess the potential of the identified areas to support wildcat populations.
- Badger: Badgers have been recorded as being present within 150 m of the proposed grid connection running through Strathy North Forest therefore there is potential to impact the badger population at this location as result of the T39 Layout. The effects

and predicted magnitudes of significance remain unchanged to those presented within the 2013 ES Addendum.

- Water Vole: The reduced numbers of watercourse crossings reduces the potential effects on water vole and their habitats across the site. However, the effects remain unchanged to those presented within the 2013 ES Addendum.
- Fish: The decrease in watercourse crossing numbers reduces the likelihood of potential siltation, acidification and pollution risk. Ensuring appropriate mitigation is in place to avoid a peat landslide into a watercourse the overall effect is considered to be Not Significant. It should also be noted that a Water Quality Monitoring Plan (WQMP) has been prepared and submitted to the Scottish Environmental Protection Agency (SEPA), the Northern District Salmon Fishery Board (NDSFB) and Marine Scotland Sciences (MSS). The purpose of the WQMP is to provide pre-construction, construction and post-construction biological and hydrochemical monitoring within the Strathy catchment. The WQMP has been approved by SEPA.

Therefore, the overall impacts on the species outlined above have not altered as a result of the T39 Layout.

5.3.4 Cumulative Effects

Taking into consideration the updated baseline conditions, the T39 Layout, and the adjacent developments (2013 ES Addendum Figure A1.2) of Strathy North Wind Farm (consented) and Strathy Wood Wind Farm (submitted), potential cumulative impacts are considered.

In assessing cumulative impacts for all receptors (Habitats, wildcat, otter, water vole, pine marten and fish) it is important to reiterate that, wherever possible, proposed infrastructure for the T39 Layout aims to utilise any infrastructure for the consented Strathy North Wind Farm, to minimise environmental impacts as far as possible. Cumulative impacts remain as negligible/ minor for all VERs when assessing the T39 Layout.

In comparison to the Modified 2013 Scheme, there is no overall significant change to the impact experienced at any of the VERs as a result of the T39 Layout.

5.4 Birds

Technical Appendix 5.2 to this FIR seeks to assess the potential impact of the T39 Layout on red-throated diver and greenshank; the two species for which SNH has outstanding objections to following the submission of the 2013 ES Addendum in support of a 47 turbine layout (the Modified 2013 Scheme). The following paragraphs provide a summary of this assessment, refer to Technical Appendix 5.2 for further detail.

Technical Appendix 5.2 describes the consultation that has occurred between the Applicant and SNH in the period since the submission of the 2013 ES Addendum, and also the changes made to the proposed development in light of this consultation, which resulted in the removal of eight turbines.

Whilst the Applicant considers there is already sufficient comprehensive information in the 2013 ES Addendum from which SNH can come to a clear view, the results of additional fieldwork conducted in 2014 provides further evidence, particularly on breeding distribution and flight activity of red-throated diver. The 2014 findings report low flight activity within the red line boundary for red-throated diver and greenshank. Furthermore, the use of a camera trap at Loch 64 confirms that no breeding attempt was made there by red-throated divers in 2014.

The data from 2014 is then combined with data from 2007 onwards, along with the T39 Layout, to establish the difference in estimated collision risk for red-throated diver and greenshank. Collision risk from 2003 and 2004 data was negligible.

The collision risk was zero for red-throated diver and greenshank in 2014, and the estimates presented as an average of 2007-2014 data are substantially lower for the T39 Layout (0.14 collisions per year for red-throated diver and 0.01 collisions per year for greenshank) than was the case for the Modified 2013 Scheme assessed in the 2013 ES Addendum (0.23 collisions per year for red-throated diver and 0.04 collisions per year for greenshank).

Following extensive consultation with SNH regarding breeding greenshank at Strathy South, clarification and further methods to assess the numbers of greenshank present around the proposed development are presented using data collected in 2010 and 2012, which are the most intensive years of data collection for breeding greenshank. These outputs are related to currently accepted population estimates for the Caithness and Sutherland Peatlands Special Protection Area (SPA) and previous advice provided by SNH with respect to disturbance distances. The outputs from these methods estimating breeding greenshank abundance within 1 km of Strathy South are similar to those generated by methods used in the 2013 ES Addendum.

Technical Appendix 5.2 concludes with a review and update of the conclusions of the 2013 ES Addendum with regard to red-throated diver and greenshank, based on the differences between the T39 Layout and the Modified 2013 Scheme, and taking account of the addition of the 2014 field data. The conservation objectives of the Caithness and Sutherland Peatlands SPA are also considered as part of this review. The conclusions of the 2013 ES Addendum are judged to remain valid, and the predicted effects of the T39 Layout are considerably lower, and therefore even more precautionary than those relating to the Modified 2013 Scheme (47 turbine layout).

It is concluded that the proposed Strathy South T39 Layout can be built, operated and decommissioned without an adverse impact on the integrity of the Caithness and Sutherland Peatlands SPA.

5.5 Noise

This section highlights the differences between the updated predicted operational noise levels to account for the reduction in the number of turbines at Strathy South and the results presented in the Modified 2013 Scheme in Chapter A12: Noise of the 2013 ES Addendum. Additional cumulative predictions have been carried out to take into account the change of turbine type and change to the layout of the Strathy Wood wind farm since the 2013 ES Addendum was submitted in July 2013. The construction noise assessment presented in the 2013 ES Addendum remains valid because any changes to the number of turbines will not significantly affect the conclusions of the construction noise assessment.

Revised noise predictions have been undertaken to take into account the Strathy South T39 Layout and the change to the proposed turbine type and small change in the layout of the submitted Strathy Wood wind farm as compared to the scoping layout which was the layout used in the 2013 ES Addendum cumulative noise assessment. The candidate turbine presented in the Strathy Wood ES is the Siemens SWT3.0-101 turbine with a hub height of 100 m. The source noise data for this turbine is presented in the Strathy Wood ES, and has been used here with an additional 2 dB added to the warranted noise levels to ensure that the same methodology has been applied as described in the Strathy South 2013 ES Addendum. The source noise data for the Siemens SWT3.0-101 turbines used in the

updated predictions is detailed below in Table 5.5.1, together with the assumed octave band spectrum presented in Table 5.5.2, based on the data presented in the Strathy Wood ES.

Table 5.5.1: Declared Apparent Sound Power Levels Used in the Predictions (L_{Wd})

Wind Farm and Wind Turbine	Standardised 10 m-height Wind Speed (m/s)									
	3	4	5	6	7	8	9	10	11	12
Strathy Wood Siemens SWT3.0-101, 100 m hub	97.4	102.2	107.3	109.2	110.0	110.0	110.0	110.0	110.0	97.4

Table 5.5.2: Octave Band Noise Levels Used in the Predictions (dB L_{WA})

Wind Turbine	Octave Band Centre Frequency (Hz)								
	Overall	63	125	250	500	1k	2k	4k	8k
Siemens SWT3.0-101	108.0	82.8	94.7	101.4	104.7	101.4	93.5	82.6	79.3

The updated predictions presented in this report use the same methodology and source noise data as presented described in the 2013 ES Addendum except for the change in turbine type for the Strathy Wood application, detailed above.

The results of the noise predictions, including the cumulative noise predictions, are shown below in Table 5.5.3 for the T39 Layout. The table below is an updated version of Table A12.9 presented in Chapter A12: Noise of the 2013 ES Addendum.

Table 5.5.3: Results of Cumulative Noise Predictions at Nearest Residential Locations

Location	Easting	Northing	Predicted Noise Level for standardised 10 m-height wind speed of 8 m/s (dB L_{A90})				
			Total Predicted Noise Level	Strathy South	Strathy North	Strathy Wood	Strathy North and Strathy South
Braerathy Lodge	282335	956155	55.4	28.5	40.8	55.3	41.1
Dallangwell	282525	959903	38.2	21.1	36.6	32.6	36.8
Bowside	283050	960898	33.6	19.4	31.3	29.4	31.6
Bowside Lodge	282917	960980	33.5	19.3	31.3	29.2	31.5

The differences between the results presented in the 2013 ES Addendum and the updated predictions are detailed in Table 5.5.4 below; a negative number indicates a reduction in predicted noise level from that presented in the 2013 ES Addendum.

Table 5.5.4: Predicted Noise Level Differences between the 2013 ES Addendum Results and the Updated Prediction Results

Location	Easting	Northing	Predicted Noise Level Differences for standardised 10 m-height wind speed of 8 m/s				
			Total Predicted Noise Level	Strathy South	Strathy North	Strathy Wood	Strathy North and Strathy South
Braerathy Lodge	282335	956155	1.0	-1.0	0.0	1.1	0.0
Dallangwell	282525	959903	0.0	-1.2	0.0	0.0	0.0
Bowside	283050	960898	-0.3	-1.1	0.0	-0.7	0.0
Bowside Lodge	282917	960980	-0.4	-1.2	0.0	-0.7	-0.1

The results of the updated noise predictions show a reduction in the predicted noise levels from Strathy South alone of between 1.0 and 1.2 dB at the four nearest assessment locations to the proposed wind farm. Predicted cumulative noise levels have reduced by up to 0.4 dB at Dallangwell, Bowside, and Bowside Lodge, but have increased at Braerathy Lodge by 1.0 dB due to the change in layout and candidate turbine for the Strathy Wood wind farm.

Predicted noise levels from Strathy South alone are below 30 dB LA90 at all nearby residential properties, and therefore no significant operational noise effects are predicted. Cumulative predicted noise levels are only above 35 dB L_{A90} at Braerathy Lodge and Dallangwell; however, Strathy South adds insignificantly (0.3 dB) to the consented Strathy North noise levels at Braerathy Lodge, and Dallangwell is owned by SSE and therefore qualifies for the financially involved noise limit of 45 dB L_{A90}. No significant cumulative operational noise effects are predicted.

5.6 Cultural Heritage

This section assesses and compares how the reduction in turbine numbers and the associated reduction in on-site tracks compares to those impacts presented for the Modified 2013 Scheme in Chapter A13: Cultural Heritage of the 2013 ES Addendum.

5.6.1 Direct Impacts

The 2013 ES Addendum identified thirteen cultural heritage assets on site which could be affected by the Modified 2013 Scheme (Figure A13.1: Cultural Heritage Sites of the 2013 ES Addendum). Of the thirteen archaeological sites identified within the red line site boundary, only one, Site 1 (a shieling), lies within the area where turbines and tracks have been removed as part of the T39 Layout proposals. This site was described as being of local interest and low sensitivity. The magnitude of impact of the Modified 2013 Scheme on this feature was considered to be low and the significance of the impact negligible. It should be noted that the summary of impacts of the Modified 2013 Scheme on all thirteen archaeological features concluded that the significance of impact on all of them would be negligible. Therefore, there is effectively no alteration to the magnitude and significance of impacts as a result of the T39 Layout proposals.

5.6.2 Indirect Impacts

A Scheduled Monument called Ben Griam Beg, was identified as a receptor of high sensitivity to indirect, visual impacts. The magnitude of impact for the Modified 2013 Scheme was considered to be low to medium and the significance of the setting impact balanced between minor and major. The setting impact consisted of a major change in landscape character; however, the Modified 2013 Scheme would not distract from, or obstruct, key views. The reduction of access tracks for the T39 Layout is irrelevant to the consideration of visual impacts. However, the reduction of the number of turbines would have the visual effect of reducing the density of visible turbines on the west side of the group, breaking the solid block into scattered, smaller clusters (Figure 5.7.1 and Figure 5.7.2). At a distance of over 7 km from Ben Griam Beg this reduction of visual impact would be perceptible but small. The Modified 2013 Scheme was concluded to have an indirect visual impact on the setting of Ben Griam Beg. The assessment concluded that this impact would be low to medium magnitude, with a minor significance, and the present T39 Layout is considered to result in the same conclusion.

Cumulative visual impacts on Ben Griam Beg are, by the same reasoning as above, considered to be unchanged, i.e. there would be a perceptible but small reduction in the density of the west side of the group consisting of Strathy North, Strathy Wood and Strathy South schemes; the magnitude of cumulative impact would be low to medium, and the significance of setting impact minor to major.

Therefore, the conclusions reported in Chapter A13: Cultural Heritage of the 2013 ES Addendum remain unchanged for the T39 Layout.

5.7 Soil and Water

This section assesses and compares how the reduction in turbine numbers and the associated reduction in on-site tracks compares to those impacts presented for the Modified 2013 Scheme in Chapter A14: Soil and Water of the 2013 ES Addendum.

- As a consequence of the revised layout a number of areas of thick peat (>1.5m) would be avoided, notably around T51, T55 and T74. By reducing the turbine numbers to 39 from 47 and removal of their associated access tracks (reduction of approximately 5.8 km), the amount of peat requiring excavation would be reduced by approximately 42,000 m^3 (i.e. a reduction of 14.8% compared to that required for the Modified 2013 Scheme); and
- As a result of the reduction in on-site tracks and the use of the ‘alternative’ access route (Figure 4.1), the number of watercourse crossings would be reduced from 18 to 15.

Therefore the T39 Layout does not result in any significant changes to the impact significance conclusions reported in Chapter A14: Soil and Water in the 2013 ES Addendum.

5.8 Roads and Traffic

The section assesses and compares how the reduction in turbine numbers and the associated reduction in on-site tracks compares to those impacts presented for the Modified 2013 Scheme in Chapter A15: Roads and Traffic of the 2013 ES Addendum.

Chapter A15: Roads and Traffic of the 2013 ES Addendum provided an updated assessment of the potential roads and traffic effects of the Modified 2013 Scheme to those

presented for the Original 2007 Scheme in the 2007 ES. It was concluded in the 2013 ES Addendum that no mitigation measures would be required for the operational traffic impacts because as the amount of associated operational traffic would be minimal.

As a result of reducing the turbine numbers from the 47 proposed in the Modified 2013 Scheme to the 39 proposed in the T39 Layout, there would be a subsequent reduction in the volume of associated construction traffic and abnormal loads.

Therefore, considering the roads and traffic conclusions of the Modified 2013 Scheme and assuming that the construction delivery phasing and proposed mitigation measures remain unchanged the same conclusions can be deduced for the T39 Layout. This means that the T39 Layout would not result in any significant residual impacts.

5.9 Other Issues

5.9.1 Air and Climate

As discussed in Section 4.9.1 above, a PMP and a peat balance have been prepared and are included in Technical Appendices 4.1 and 4.2 of this report. The estimated reductions in carbon dioxide that would result if the estimated annual output of the T39 Layout displaces coal fired generation together with the grid mix generation are shown in the carbon calculator provided in Technical Appendix 4.2 of this report.

The results of the initial peat balance calculations concluded that the carbon payback (based on a fossil fuel mix of electricity generation) would be 1.5 years for the Modified 2013 Scheme. Following further consultation with SEPA post-submission of the 2013 ES Addendum, minor edits were made to the carbon calculator and SEPA signed off the revised carbon calculator in February 2014[7]. The approved carbon calculator concluded that the carbon payback for the Modified 2013 Scheme would be reduced to 0.8 years from the 1.5 years originally reported.

The results of the carbon calculator for the T39 Layout concluded that the carbon payback period would be expected to be 1.1 years.

The carbon calculator has taken into account the fact that floated road construction would be used and it is also proposed to adopt best practice construction techniques on site to minimise impacts on the peat environment.

The T39 Layout payback period is slightly higher than that which was estimated for the Modified 2013 Scheme. This slight increase is expected because the T39 Layout has decreased in size by eight turbines and therefore the payback period would be expected to be longer (i.e. a reduction in turbine numbers would cause a reduction in the electricity generation capacity of the scheme and therefore payback periods would increase; however, as noted, the increase is marginal).

5.9.2 Telecommunications and Aviation

Following submission of the 2013 ES Addendum in July 2013, the MoD objected to the scheme based on a number of turbines located in its low fly training zone (Table 3.1). However, the MoD noted in its response that if T68, T73, T74 and T76 could be removed from the layout, this would remove the obstruction to an extent whereby the MoD would have

[7] Letter to Kate Lyon (ENVIRON) from Cerian Baldwin (SEPA), dated 11/02/2014 (Reference: PCS/131334)

no reason to object to the proposal. The T39 Layout removes the four turbines and therefore the MoD objection is considered to be resolved.

5.9.3 Recreation and Tourism

T39 Layout would still require the temporary closure of Track Hill Track 334 during the construction period. SSE has offered to prepare an Outdoor Access Management Plan (OAMP) as a condition of consent. The OAMP would include information such as the existing access points and paths. It would identify any routes that would be affected by the proposed development during the construction period. Specifically, the OAMP would include information about Track 334 and the proposed timing of closure during the construction period.

5.9.4 Social and Economic

Local Economic Benefit

The main economic benefit of the T39 Layout would still be during the construction phase of the development. It remains that suitably qualified local firms would be invited to bid for a large proportion of the construction work.

The capital cost of the T39 Layout remains as £1.6 million per megawatt. On this basis £212.16 million would be invested. This has reduced in comparison with the expected £256 million investment expected for the Modified 2013 Scheme, this is due to a reduction in the plant and infrastructure required for the T39 Layout.

The greatest opportunities for contracts and local employment would still come from the civil engineering contracts. It is expected that the on-site construction workforce total would reduce from 140 for the Modified 2013 Scheme to approximately 117. The workforce would still comprise forestry contractors, civil contractors, turbine contractors, electrical contractors and project managers, albeit in slightly reduced numbers. This reduction is again expected due to the decrease in infrastructure and plant required for the T39 Layout.

On average, the site staffing level would be approximately 27 individuals at any one time with maximum staffing levels reaching 53 personnel, this is reduced from 32 and 64 respectively when compared to those estimated for the Modified 2013 Scheme.

The development and construction phases (capital costs) for the T39 Layout are estimated to be approximately 18% less than the Modified 2013 Scheme capital costs.

Community Benefit

The Applicant's policy on community investment remains the same for the T39 Layout; £5,000 per MW per year for the duration (25 years) of the operation of the wind farm. This would still be split between a local community benefit and a wider sustainable energy fund, which equates to £663,000 per year, index linked for 25 years. This would bring the total community benefit to approximately £16.6 million over the 25 year operational period of the wind farm. It would continue to provide a lasting legacy from the Applicant's community investment funding, through supporting and creating employment opportunities and supporting local energy projects.

6 Summary

In July 2013 an application was submitted for the Strathy South wind farm Modified 2013 Scheme (comprising 47 turbines). Objections to the application were made by the MoD and SNH. Subsequently through consultation with the MoD and SNH eight turbines have been removed from the Modified 2013 Scheme to produce the T39 Layout.

The potential for significant environmental impacts arising from the T39 Layout has been reviewed and a summary is provided below:

- LVIA: The T39 Layout considered the re-assessment of four cumulative VPs. Whilst the T39 Layout would result in reduction in the extent of designated and non-designated landscapes potentially affected by turbine visibility, these would not alter the overall perceived scale of the proposed development or any of the assessed impacts identified in the 2013 ES Addendum;
- Ecology: As a result of the T39 Layout there is a reduction in habitat loss and fewer watercourse crossings when compared to the Modified 2013 Scheme. However, there is concluded to be no change to the impact for either habitats or fauna as a result of the T39 Layout;
- Birds: The conclusions of the 2013 ES Addendum are judged to remain valid, however the predicted effects of the T39 Layout are considerably lower, and therefore even more precautionary than those relating to the Modified 2013 Scheme.
- Noise: The T39 Layout, when compared to the Modified 2013 Scheme, results in a slight reduction in predicted noise levels at sensitive receptors, but does not change the impact;
- Cultural Heritage: There is a small perceptible change in turbine density from Ben Griam Beg Scheduled Monument as a result of the T39 layout when compared to the Modified 2013 Scheme, but there is no change to impact;
- Soil and Water: There would be fewer water crossings and reduced peat excavation volumes for the T39 Layout; however, this would not result in any change to the impact assessment results reported for the Modified 2013 Scheme;
- Roads and Traffic: the T39 Layout would result in reduced traffic volumes on the local road network but would not change the previously assessed impact ;
- Other Issues:
  - Air and Climate: The T39 Layout payback period increases from 0.8 years, as calculated for the Modified 2013, to 1.1 years (the increase in payback alters due to the reduction in turbine numbers, resulting in a consequent reduction in electricity generation capacity) however the change is not significant in EIA terms;
  - Telecommunications and Aviation: The T39 Layout includes the removal of turbines; T68, T73, T74 and T76, therefore enabling MoD to remove their objection;
  - Recreation and Tourism: The T39 Layout would still require the temporary closure of Hill Track 334 during the construction period. SSE has offered to prepare an Outdoor Access Management Plan (OAMP) as a condition of consent.
  - Social and Economic: the T39 Layout sees a small reduction in staffing levels and overall capital costs when compared with the Modified 2013 Scheme.

A comparison of the T39 Layout with the Modified 2013 Scheme found there are no changes to significance of effects. The removal of turbines has enabled the MoD to remove its objection and for SNH to remove a number of its original objections. It is considered that this FIR has provided sufficient information to enable SNH to remove its two outstanding objections in relation to red-throated diver and greenshank. Decreases in turbine numbers as a result of the T39 Layout proposals would also result in small decreases in noise levels expected at sensitive receptors, decrease the volume of excavated peat and, decrease traffic volumes on the local road networks.

Figures