4. DESCRIPTION OF THE REVISED DEVELOPMENT

4. Description of the Revised Development

4.1. Introduction

4.1.1. This chapter explains the changes to the proposed Shepherds' Rig Wind Farm ('the Revised Development'), and provides an update to the following parts of *Chapter 4 of the EIA Report*:

- Section 4.1 Introduction;
- Section 4.2 Proposed Development Layout; and
- Section 4.3 Description of the Wind farm Elements.

4.1.2. There are no changes to the following sections of Chapter 4, so that they remain valid as detailed in the EIA Report:

- Section 4.4: Construction of the Proposed Development;
- Section 4.5: Operation of the Proposed Development; and
- Section 4.6: Decommissioning of the Proposed Development.

4.1.3. The Introduction to *Chapter 4 of the EIA Report* provided an overview description of the Proposed Development and this is now updated to reflect the Revised Development (**AEI Figure 4.1**) below, with changes shown in bold:

4.1.4. The application for Electricity Act consent and deemed planning permission is for a wind energy development comprising the construction, 25 year operation and subsequent decommissioning of up to **17** turbines; together with on-site access tracks, hardstanding areas, temporary borrow workings, a substation, battery energy storage and control building compound, operational anemometry mast and on-site underground cabling. During construction, a temporary construction compound will be required which will house a site office and welfare facilities.

4.1.5. The candidate turbine types used for the EIA remain unchanged. It is expected that each wind turbine would have an output of 4.2 megawatts (MW), except T1 and T3, which would each have a maximum output of 3.6 MW, giving a total maximum installed capacity from all of the wind turbines of **70.2** MW. Turbines with a greater installed capacity could be used if they are available at the time of procurement for the Revised Development and providing that they would also fit within the environmental and planning parameters considered in the EIA and AEI reports[1].

4.1.6. The maximum output from the battery energy storage facility would be 6 MW based on current technology, so that the overall maximum output from the Revised Development would be **76.2** MW.

[1] The actual turbine capacities may differ from 4.2MW and 3.6MW, and would be the result of a turbine procurement process which would aim to maximise the renewable energy generation at the site. However the final procured turbines would not exceed the physical specifications described in this EIA report, nor would they exceed the level of residual effects predicted by the EIA process in all topics.

4.2. Revised Development Layout

Overview of the Revised Development

4.2.1. The main changes to the Proposed Development are as follows:

- Deletion of T7 and T11 and re-siting of T9 approximately 120 m to the west, primarily to reduce impacts on Craigengillan Cairn and Stroanfreggan Craig Fort Scheduled Monuments;
- Deletion of the track sections leading to T9 and T11 and the re-alignment of the track following the deletion of T7 to increase separation from Craigengillan Cairn.
- Re-siting of the following turbines on the western side of the layout to position them in shallower peat: T4; T6; T8; T10; T13 and T16. The maximum re-siting distance is approximately 80 m. In most cases, the turbines have been re-located along the original track alignment resulting in minimal changes to the track alignment.

4.2.2. There is no change to the proposed turbine dimensions from the EIA Report (November 2018). There is also no change to the substation, borrow working or construction compound dimensions.

4.2.3. The amended layout, as described above, is shown as the Revised Development in **AEI Figure 4.1**. AEI Table 4.1 specifies the indicative national grid reference and maximum tip height for each turbine; those where the position has been amended from the 2018 EIA Report are shown in grey. The turbines will be subject to a micro-siting allowance as detailed below to ensure that their final position on the ground is optimised.

AEI Table 4.1 Wind Turbine Approximate Grid References and Maximum Tip Heights

Turbine No.	EIA Report Easting	EIA Report Northing	AEI Easting	AEI Northing	Maximum Turbine Tip Height (m)
1	261952	595637	261952	595637	125
2	262221	595349	262221	595349	149.9
3	262915	595224	262915	595224	125
4	261650	595201	261734	595199	149.9
5	262475	594930	262475	594930	149.9
6	261899	594817	261915	594785	149.9
7	262775	594588	**Turbine removed**		149.9
8	262058	594415	262100	594427	149.9
9	262520	594105	262404	594135	149.9
10	262007	593901	261985	593849	149.9
11	262921	593780	**Turbine removed**		149.9
12	262325	593596	262325	593596	149.9
13	261752	593497	261738	593413	149.9

Turbine No.	EIA Report Easting	EIA Report Northing	AEI Easting	AEI Northing	Maximum Turbine Tip Height (m)
14	262667	593305	262667	593305	149.9
15	262123	593084	262123	593084	149.9
16	261406	593046	261438	592977	149.9
17	262482	592799	262482	592799	149.9
18	261690	592707	261690	592707	149.9
19	262045	592402	262045	592402	149.9

4.2.4. **AEI Figure 4.1** also shows the location of the ancillary infrastructure necessary for the Revised Development. The location of the substation, battery energy storage and control building compound has been amended so that it lies approximately 480 m further to the north-east.

4.2.5. In summary, the associated elements of the Revised Development, separate to the turbines, hard-standings and access tracks, are to be located at the following approximate locations:

- the temporary construction compound at (eastings) 262476 (northings) 591260;
- the substation, battery energy storage and control building compound at (eastings) 262192 and (northings) 594128; and
- two borrow workings at (eastings) 261871 and (northings) 592555 and (eastings) 262109 and (northings) 595388.

Micro-siting

4.2.6. The EIA Report (November 2018) set out a micro-siting allowance of 75 m for the western turbines so that their position could be adjusted prior to construction to minimise peat disturbance and a 50 m distance for all other turbines. The western turbines have now largely been relocated so that they are no longer situated within areas of peat deeper than 1 m.

4.2.7. The micro-siting distance for all turbines and associated infrastructure is therefore standardised to **50 m**.

4.3. Description of the Wind Farm Elements

4.3.1. As part of post-submission refinements, *Section 4.3: Description of the Wind Farm Elements* remains largely as detailed in EIA Report (November 2018). The exception to this is certain quantities and dimensions in some of the subsections which are amended as follows to reflect the Revised Development presented in **AEI Figure 4.1**.

On-Site Access Track

4.3.2. The measurements for the access tracks are amended to reflect the Revised Development, as described below and presented in **AEI Figure 4.1**.

4.3.3. The on-site access track layout has been amended as a result of the deletion of the two turbines and the re-siting of others. Consequently, the removal of the access tracks associated with T7 and T11 only marginally reduces to total of on-site access track length is from 11 km to just under 11,000 m. It is anticipated that that approximately 9 km of new access track including turning heads, and approximately 2 km of existing upgraded forest track is required.

Watercourse and Service Crossings

4.3.4. As a result of the Revised Development layout, the number of watercourse crossings is amended from nine to ten, although four of them are upgrades to existing crossing; they are shown on **AEI Figure 13.2**.

Electrical Connections On-Site

4.3.5. The total length of cable trench required to connect the turbines to the on-site control building has not changed as a result of the Revised Development and remains approximately 9,500 km.

Borrow Workings

4.3.6. Table 4.3 of the EIA Report (November 2018) provided a breakdown of the required rock volumes for each construction element of the Revised Development. The revised estimated rock volumes as a result of deleting two turbines and amending the layout are set out in AEI Table 4.2 of this chapter.

AEI Table 4.2: Estimated Rock Volumes Required during Construction

Infrastructure	**Total Rock Volume (m^3)**
Hardstandings and foundations	45,675 (reduced from 50,750)
Tracks	22,050 (reduced from 26,700)
Temporary construction compound	2,500 (no change
Substation compound	800 (no change)
Total Rock Volume	**71,025 (reduced from 80,750)**

Concrete Batching Plants

4.3.7. AEI Table 4.3 below provides estimated volumes of concrete required for the installation of the 17 wind turbines within the Revised Development.

AEI Table 4.3: Estimated Volume of Concrete

Infrastructure	**Total Volume of Concrete (m^3)**
17 Wind Turbine Foundations	8,500 (reduced from 9,500)
Substation/Control Building Foundations	1,566 (no change)
Total Concrete Volume	**10,066**

4.3.8. Transportation of concrete from off-site locations would require approximately 56 loads per foundation, assuming 9 m^3 wagons are used. This would result in

a slight reduction of vehicle movements from 2,128 to approximately 1,904 vehicle movements for foundation concrete delivery, subject to confirmation of design.

Development Land Take

4.3.9. The total development land take (footprint) is amended from 24.5 ha to 15.83 ha.

Forestry

4.3.10. The forestry section is amended as follows to take into account the Revised Development layout. In total, 39.4 ha would be felled due to the construction of the wind farm which is reduced from 55.1 ha, with a net loss of woodland area reduced from 61.1 ha to 53.4 ha.

Grid Connection

4.3.11. The Longburn wind farm scheme was refused at appeal in May 2019. Paragraph 4.3.85 of the original EIA Report should therefore read as follows.

4.3.12. It is likely that the wind farm would be connected into the national transmission system in the vicinity of Holm Hill near the A713, approximately 7 km to the north-west of the Site, via a new pole mounted overhead 132 kV line currently being planned by Scottish Power Energy Networks to connect the Lorg wind farm. This will be subject to a separate application.

4.4. Mitigation and Enhancement Measures Summary

4.4.1. As a result of the Revised Development, the following sections of EIA Report Table 4.8 are amended in AEI Table 4.4 below: forestry, cultural heritage, and geology. The revised sections of this table are provided below with all other technical disciplines remaining as described in the EIA Report Table 4.8.

AEI Table 4.4: Summary of Mitigation and Enhancement Measures

Chapter/Topic	Proposed Mitigation / Enhancement Measure
Forestry	Revised compensatory planting to 53.4 ha.
Cultural Heritage	Direct impacts upon field boundary walls (HA1) are to be mitigated with a programme of archaeological works. The detail of these works will be agreed with the DGC Archaeologist. Operational impacts upon Craigengillan Cairn (SM2238) have largely been mitigated through design but will be further mitigated with a programme of forestry management. The details are to be agreed with HES and DGC, but it is likely to comprise some clear felling around the Scheduled area to create a visual corridor

	to/from the asset, supplemented with screen planting of appropriate broadleaf species.
Geology	Revised micrositing to standard 50 m.