Chapter 3

Proposed Development

SCOTTISHPOWER RENEWABLES

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Proposed Development

3.1 Introduction

1. This Chapter of the Hollandmey Renewable Energy Development (RED) (hereafter the 'proposed Development') Environmental Impact Assessment (EIA) Report describes the way in which the proposed Development would be constructed, including a general description of the proposed renewable energy technologies (i.e., wind turbine and solar array layouts) and their associated infrastructure. It also outlines the anticipated construction activities connected with the proposed Development and a description of the operational elements of the renewable energy technologies.

2. The layout for the proposed Development is shown on **Figure 3.1** including proposed infrastructure. Additional details on construction methods are provided in the outline Construction Environmental Management Plan (CEMP) included in **Technical Appendix 3.1: Outline Construction Environmental Management Plan**. Details on the forestry aspects of the proposed Development are included within the section on forestry in **Chapter 15: Other Issues** and **Technical Appendix 15.1: Forestry.**

3.2 Proposed Development

3. The proposed Development, as assessed and reported in the EIA Report, has an installed capacity of up to 65 MW, comprising 10 wind turbines with a ground to blade tip height of 149.9 m with a generating capacity of around 50 MW, and around 15 MW of ground mounted solar arrays. The proposed Development also includes approximately 15 MW of battery energy storage (BESS).

4. The proposed Development would include associated infrastructure comprising:

- turbine foundations;
- crane hardstandings;
- transformer/switchgear housings located adjacent to turbines;
- access tracks (existing, upgrade of existing or new as required);
- watercourse crossings (upgrade of existing or new as required);
- underground electrical cabling;
- permanent met mast and LiDAR compound;
- up to two temporary Power Performance Masts (PPM);
- a temporary windfarm construction compound area and a temporary solar construction compound area;
- a substation compound;
- closed-circuit television mast(s);
- communication mast(s);
- permanent control building;
- up to three borrow pit search areas; and
- health and safety and other directional site signage

5. To enable construction and operation of the proposed Development, forest restructuring works would be required.

3.2.1 Operational Life

6. ScottishPower Renewables Ltd (hereafter, 'the Applicant') is committed to the operation of the proposed Development and is therefore seeking consent in perpetuity. This is in response to the ongoing and long-term requirement for renewable energy sources to meet our future energy needs and to meet the carbon dioxide 2050 reduction target of the UK Government and the 2045 target of the Scottish Government. It is planned to operate the proposed Development in accordance with the consent on an ongoing basis. Should there be a failure of any renewable energy technology beyond economic repair or if the technology comes to the end of its viable operating life, The Applicant would replace the appropriate renewable energy infrastructure with a similar model of the same dimensions and appearance. Such operations would be similar to construction and these effects are examined in the technical subject area chapters of this EIA Report (**Chapters 7** to **15**). Should consent be granted, it is anticipated that there would be a condition which would address the requirement to either remove renewable energy infrastructure should they become non-operational for a defined period of time or to replace the infrastructure like for like. Therefore, the assessment of all technical areas considers the effects of the operational phase of the proposed Development without time limitations.

3.2.2 Grid Connection

7. The grid connection point and date of connection for the proposed Development is subject to confirmation by the network operator/owner. Based on discussions to date a grid connection of 2026 is considered possible.

8. The precise route of the grid connection cabling has not yet been fully determined; however, it is likely that the proposed point of connection would be the proposed Gills Bay Substation.

9. The grid connection is likely to require consent under Section 37 of the Electricity Act 1989 which is the subject of a separate consenting process to this Section 36 application.

3.2.3 Wind Turbines

10. The proposed Development includes the installation and operation of 10 three-bladed horizontal axis wind turbines at the Site. The proposed turbine locations are shown on **Figure 3.1** and the coordinates for each are provided in **Table 3.1**.

Table 3.1: Turbine coordinates

Turbine No.	OS Easting	OS Northing
1	328397	970004
2	328796	969598
3	328700	968860
4	328781	968240
5	329515	969620
6	329467	968729
7	329963	970204
8	330120	969444
9	330129	968731
10	330588	970185

12. The wind turbines would each have an installed capacity of around 5 MW based on wind turbine technology which is currently available and would have a maximum height of 149.9 m to blade tip, in order to minimise the landscape and amenity effects of the proposed Development. The wind turbines would each incorporate a tapered tubular tower and three blades attached to a nacelle that would house a turbine generator and other operating equipment. The turbines would be semi-matt pale grey, or a finish agreed with The Highland Council (THC).

13. The candidate turbine model to be installed as part of the proposed Development would be selected through a competitive procurement process. In each assessment in the EIA, a worst-case scenario of the turbine dimensions/characteristics has been used. An indicative turbine for the proposed Development is shown on **Figure 3.3**.

14. Each turbine is likely to be served by an electrical transformer/switchgear unit that would be located externally adjacent to the turbine base. The transformer/switchgear housing would measure approximately 10 m(l) x 5 m(w) and 4 m(h). The external finishes would typically be metal, reinforced glass, or moulded plastic. An indicative external transformer/switchgear unit is shown in **Figure 3.4**.

3.2.4 Wind Turbine Foundations and Crane Hardstandings

15. Wind turbine foundations would be designed to accommodate the final choice of turbine and to suit site-specific conditions. The final design would depend on the findings of detailed ground investigation at each turbine location. An illustration of a typical wind turbine foundation is provided in **Figure 3.5**.

16. The turbines would have gravity foundations over an area of approximately 22 m diameter and would be of reinforced concrete construction. The depth of the excavation would depend on the ground conditions, as a minimum the foundations would be 3.5 m deep. The sides of the excavation would be graded back from the foundation to approximately a 35 m diameter and battered to ensure that they remain stable during construction. The wind turbines would be erected using mobile cranes brought on to the Site for the construction phase.

17. A main crane hardstanding would be built adjacent to each wind turbine and is likely to have a footprint of 40 m x 20 m, with the depth dependant on the underlying bearing strata. The crane hardstanding design and layout would be determined by the wind turbine supplier according to their preferred erection method and site investigation to assess ground conditions. An indicative crane hardstanding design has been considered for the purposes of this assessment, which shows the installation area comprising multiple hardstanding areas, and is provided in **Figure 3.6**. The installation area also includes a trestle area for the blades with a foundation footprint of 43.7 m by 15 m, a hardstanding for the assist crane (19 m x 11 m), two storage areas for containers (20 m x 12 m), a storage area for components (71 m x 5 m), and potentially a hardstand for boom assembly . The crane hardstanding foundation areas would remain in situ for the duration of the operational phase of the proposed Development; however, the laydown areas would be reinstated following the construction phase.

18. Soils that are excavated during construction would be set aside and used for backfilling of foundations and reuse in restoration of disturbed areas around the turbine locations and hardstandings, any excess excavated peat would be used elsewhere onsite. Further details of soil storage, including peat management, would be developed through the CEMP and Peat Management Plan (PMP). **Technical Appendix 10.2: Outline Peat Management Plan** contains peat calculations that outline the total volumes of peat that would be excavated and reused onsite by peat type and infrastructure element.

3.2.5 Solar Array

19. The solar array is proposed to cover an area of 17.4 ha, which would be located to the north of the Site. These areas have been selected due to the slope and angle of the land and to avoid environmental constraints, as outlined in **Chapter 2: Site Description and Design Evolution**.

20. The solar array would comprise rows of individual solar panels. Each panel would have a capacity of around 370 watts, would be fitted to a metal frame and angled in the direction of the sun. The solar array's frames would be installed first and the mounting structures would be anchored to the ground using small piles (**Figure 3.7)**.

21. Rows of solar panels would be spaced between 5 m and 7 m apart and would be located between 0.5 m to 1 m above the ground. In between the solar panels, small tracks may need to be installed to enable access for maintenance. These tracks would be designed for four-wheel drive vehicles.

22. Low voltage cables buried underground would run from each of the solar arrays to a collector station and then onwards to the Site substation.

3.2.6 Battery Energy Storage System (BESS)

23. It is proposed that a BESS in the form of storage units would be installed within the compound along with a control building and substation for the proposed Development (**Figure 3.2**). The BESS would have an energy storage capacity of around 15 MW and provide grid support services such as frequency control, reactive power compensation and re-starting the electrical grid in the event of failure ('black start').

24. The battery containers would be of steel construction, and very similar to shipping containers in appearance. It is likely that each container would typically measure 12.2 m (length) x 2.43 m (width) x 2.59 m (height) with ancillary equipment such as inverters. The final design of the BESS would be based upon the technology available at the time of construction. It is likely that a separate switchgear container for the necessary electrical plant to operate the batteries would be required, and this too would be accommodated within the compound.

3.2.7 Control Compound

25. A substation and control building would be located within a larger compound, measuring 80 m by 65 m, which would also house the BESS containers, described in **Section 3.2.6**. The substation would be constructed and owned by the electricity grid network operator which is Scottish Hydro Electric Transmission.

26. The permanent control compound would comprise of a range of electrical grid equipment, such as, but not limited to:

- control buildings
- ancillary grid service equipment
- energy storage units
- transformers;
- heating, ventilation and air coolers
- electrical cabling; and
- other electrical equipment.

27. The proposed Development would be connected to the substation and electricity network via the onsite control building described above. An indicative control building compound and elevations are shown on **Figure 3.9**. The control building would also host solar panels on the roof to reduce the carbon footprint of the building and would likely include other energy efficient measures, such as rainwater harvesting for flushing of toilets. A small car park would also be located within in the control compound.

28. A security fence of around 3 m in height would be installed around the perimeter of the ancillary services compound and the Site would be served via a locked access gate (see **Figure 3.2)**.

3.2.8 Electric Cables

29. The proposed Development would comprise underground electric cables which would connect the renewable energy technologies to the substation and control building compound. The majority of the underground power cables would run parallel to access tracks in trenches to the proposed control building compound. The trenches would be typically 1.2 m deep and 0.7 m wide. Indicative cable trench arrangements are provided in **Figure 3.9**.

3.2.9 Access Tracks, Passing Places and Turning Heads

30. Approximately 12 km of access tracks, including approximately 3.08 km of existing track and upgraded existing track would be required to provide access to the wind turbines, control building compound, solar arrays and construction compound. Indicative track details are shown in **Figure 3.10**.

31. Tracks would have a typical 5 m width, which would be increased according to comply with the turbine supplier's access requirements on bends and at junctions. Where not possible to avoid areas of deep peat, floating tracks would be required to be constructed. It is anticipated that there would be approximately 2.75 km of floating track, where consistent peat depths greater than 1.2 m are identified along with shallow topography in the area (below 5%).

32. Access tracks would widen on bends and junctions and passing places would be placed approximately every 500 m between turbines. The construction traffic passing places would be 25 m by 5 m, with a 5 m splay in/out, to accommodate the largest turbine component delivery vehicles. Indicative cross sections of the proposed access tracks and plan of the passing places is provided in **Figure 3.10**.

33. Turning heads, to enable unloaded vehicles to turn, have been proposed to avoid significant distances of reversing. Typically, these are on tracks longer than 200 m or where there is a significant slope gradient between the hardstanding and turning area. The turning heads measure approximately 35 m in length with a 25 m bend radius. The location and specification of turning heads are subject to turbine manufacturer and site health and safety requirements.

34. The existing land access to the Site is via the C1033 Everly to Crockster Toll Road which runs north west of the Site.

35. This access would be upgraded to safely allow the delivery of wind turbines and construction materials. The proposed site access option is shown in **Figure 3.11.** The access route and site access are addressed further in **Chapter 12: Access, Traffic and Transport.**

3.2.10 Permanent Met Mast (PMM)

36. One PMM, up to 84 m in height may be erected, dependant on the final turbine model selected (**Figure 3.13**). The proposed PMM location is shown on **Figure 3.1**. The PMM would require a concrete foundation measuring approximately 9.2 m x 9.2 m, with a depth of up to 3 m. The construction method of the foundation would be similar to that used for the turbines. In addition, a crane hardstanding, measuring 20 m x 20 m would be required adjacent to the PMM to allow for the erection of the PMM. A permanent access track to the PMM, as shown on **Figure 3.1**, would be installed. The PMM would have a security fence around its base to control access.

3.2.11 Temporary Power Performance Masts (PPM)

37. Up to two, 84 m temporary PPM may be erected, dependant on the final turbine model selected (**Figure 3.12**). The locations of the proposed PPM are shown on **Figure 3.1**. If required, the PPM would be erected early in the construction programme and would record data for several months before turbine erection and remaining installed for a period of up to two years following turbine commissioning. No crane hardstandings would be required for erection of the PPM.

3.2.12 Watercourse Crossings

38. Watercourse and ditch crossings have been avoided in the design of the access track layout as far as possible; however, there would be six new or upgraded watercourse crossings within the Site and an additional two within the offsite area of the application boundary. Five of these new watercourse crossings are to allow access to the wind turbines, and one is along an existing access track, these crossings require authorisation (under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 as amended, known as CAR). There are a number of minor watercourses that would require crossings, which do not require authorisation. Further details on the watercourse crossings are contained in a Watercourse Crossing Assessment is provided in **Technical Appendix 10.5: Drainage Impact and Water Crossing Assessment**.

3.2.13 Borrow Pits

39. Three borrow pits have been identified (see **Figure 3.1**), to provide a total of approximately 108,000 m^3 of material, including a 25% contingency to allow for underestimation of requirements and some excavated material being unsuitable, to construct the proposed Development (coordinates provided in **Table 3.2** and details presented in **Technical Appendix 10.3: Borrow Pit Assessment**). The full use of all of these borrow pits would provide a greater volume of rock than would be needed for the construction of the proposed Development but allows for the current uncertainty of the quality of the rock at these locations. It is likely that all three of the borrow pits would be required.

Table 3.2: Borrow Pit information

Aggregate source	NGR Reference	Design Volume (m^3)
Borrow Pit 1	ND296709	30,000
Borrow Pit 2	ND297700	70,000
Borrow Pit 3	ND286697	8,000

3.2.14 Lighting

41. Artificial lighting may be required during the construction phase to ensure safe working conditions during periods of limited natural light. Examples include vehicle and plant headlights, construction compound lighting, floodlights and mobile lighting units, to be used around specific construction activities. It is intended that the type of lighting would be non-intrusive (e.g., directed down and towards works activity and away from application boundary), to minimise impact on local properties and any other environmental considerations.

3.2.15 Felling

42. The proposed Development would require 24.3 ha of woodland to be felled to facilitate construction of the wind turbines and associated infrastructure and solar array infrastructure. Forestry felling would be required in a keyholed radius of around 100 m from each turbine location within woodland to allow for construction, operation and environmental mitigation, including bat habitat standoff distances. Further details are provided in **Technical Appendix 15.1.**

3.2.16 Compensatory Planting

43. During the construction of the proposed Development, there would be a net loss of woodland within the Site. The area available for stocked woodland on the Site would decrease by 24.3 ha. Further details are provided in **Chapter 15: Other Issues** and **Technical Appendix 15.1.**

44. In order to comply with the criteria of the Scottish Government's Control of Woodland Removal Policy, compensatory planting would be required. The Applicant is committed to providing appropriate compensatory planting. The extent, location and composition of such planting is to be agreed with Scottish Forestry, taking into account any revision to the felling and restocking plans prior to the commencement of operation of the proposed Development.

3.2.17 Habitat Management Plan

45. The Applicant has identified opportunities to restore some areas of the Site which have been affected by historical land use (e.g., forestry and land drainage). An area of 168 ha surrounding the Philip Mains SSSI has been identified for habitat management with the aim restoring the area to bog habitat. There is currently 88.4 ha of forestry in this area that would require felling (more detail is provided in **Technical Appendix 15.1**). This would have ecological benefits in relation to habitats and species and would complement the nature of the surrounding flow area and support the SSSI features. The Applicant has conducted similar restoration measures successfully on other windfarm projects to restore bog habitats. This would also reduce runoff from the Site which could benefit the Clachan Burn, which can experience periods of flooding.

46. Furthermore, consultation with Scottish Forestry has confirmed that peatland restoration would be an acceptable substitute for compensation planting under the CWR. Appendix C of CWR identifies the following criteria for areas where woodland removal may occur without a requirement for compensatory planting:

- enhancing priority habitats and their connectivity;
- enhancing populations of priority species;
- enhancing nationally important landscapes, historic environment and geological SSSIs;
- improving conservation of water resources;
- improving conservation of soil resources; and
- public safety.

47. Therefore, the proposed restoration of bog habitat should not require compensatory planting for the forestry felled. The HMP is addressed further in **Chapter 8: Ecology and Biodiversity** and **Technical Appendix 8.6: Draft Habitat Management Plan**.

3.2.18 Design Principles and Embedded Mitigation

48. A number of design principles and environmental measures, otherwise known as embedded mitigation, have been implemented and incorporated into the proposed Development as standard practice, as described in **Chapter 2: Site Description and Design Evolution.**

49. Throughout the design embedding mitigation has been a feature of the process that has led to the final design of the proposed Development; and this embedded mitigation, therefore, forms part of the proposed Development which has been assessed in this EIA Report.

50. Reference to good practice and standards, guidelines and legislation relied upon in the assessment methodology are referred to within each of the individual specialist topics in **Chapters 7** to **15**. Such environmental measures are also included in the outline CEMP (**Technical Appendix 3.1**).

3.2.19 Micrositing

51. During the construction process there may be a requirement to microsite elements of the proposed Development infrastructure (e.g., due to unsuitable ground conditions, environmental constraints). It is proposed that a 50 m micrositing tolerance of all site infrastructure would be applied to the proposed Development. Within this distance any changes from the consented locations would be subject to approval of the ECoW as required and in consideration of other known constraints. It is anticipated that the agreed micrositing distance may form a planning condition accompanying consent for the proposed Development.

3.2.20 Consents Prior to the Commencement of Development

52. Prior to commencing construction, it may be necessary for the Applicant to obtain a number of other statutory authorisations and consents to enable the proposed Development to be implemented. Where relevant these are covered in the technical chapters (**Chapters 7** to **15**) of this EIA Report.

3.3 Construction

3.3.1 Construction Programme

53. The proposed Development would be constructed over a period of approximately 22 months, anticipated to commence in 2024. Construction would include the principal activities listed within the indicative construction programme as provided in **Table 3.3.**

3.3.2 Construction Employment

54. The number of people employed during the construction period would vary depending on the stage of construction and the activities ongoing onsite. It is anticipated that the peak workforce requirement would be around 75 construction staff. Peak daily vehicle movements during the construction phase would be 194[1].

3.3.3 Construction Hours

55. The construction working hours for the proposed Development would be 7am to 7pm Monday to Friday and 7am to 4pm on Saturdays, though noisy activities on Saturdays would be restricted to before 1pm to reduce disturbance to nearby properties. It should be noted that out of necessity due to weather conditions and health and safety requirements, some generally quiet activities, for example, abnormal load deliveries (which are controlled by Police Scotland) and the lifting of the turbine components, may occur outside the specified hours stated. The timing of the delivery of abnormal loads (i.e., wind turbine blades) will be agreed with the relevant authorities after detailed investigation. An indicative construction programme is shown in **Table 3.3**:

Table 3.3: Construction programme

Activity	Months																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Site establishment	■	■	■																			
Forestry felling	■	■																				
Access road upgrades	■	■	■																			
Construction of new access tracks and crane hardstandings			■	■	■	■	■	■	■	■	■	■										
Turbine foundation construction				■	■	■	■	■	■	■	■	■										
Substation building and electrical works				■	■	■	■	■	■	■	■	■	■	■								
Energy storage compound and installation										■	■	■	■	■								
Cable trenching and installation							■	■	■	■												
Crane Delivery										■												
Turbine delivery, erection and commissioning											■	■	■	■	■	■						
Solar foundation construction and solar delivery, erection and commissioning																	■	■	■	■		
Site reinstatement																					■	■

[1] This is based on a worst-case scenario in which aggregate it sourced offsite. If aggregate is taken from the onsite borrow pits then the peak daily vehicle movements would be 106.

3.3.4 Access to Site

56. The anticipated abnormal load route for WTG components (excluding blades) to the Site would be from Wick Harbour, south to Latheron on the A99, north west to the south of Thurso town centre on the A9 (T) and then east towards the Site on the A836 Thurso-John o'Groats road, and from the A836 to Site along either U1633 East Lodge Road or Charleston Farm Road (private road) then C1033 Everly-Crockster Toll Road. An alternative routing for WTG blades from Wick Harbour to the A9(T) has also been explored via Station Road and the A882 through Watten before joining the A9(T) at Georgemas junction. These alternative routes are illustrated by **Figure 12.2**.

57. For the BESS and solar arrays that would be installed on the Site, it is likely that they would be delivered using standard articulated lorries utilising the road network between Glasgow and the Highlands.

58. One access point is currently included in the proposed Development. This comprises an existing access at West Lodge, north west of Phillips Mains. **Figure 3.1** illustrates the location of the access point and **Figure 3.11** illustrates the design of the access point.

3.3.5 Construction Compound, Laydown Area and Solar Compound

59. A temporary windfarm construction compound would be required for the duration of the construction phase as shown in **Figure 3.1**, located at NGR ND296698. The construction compound would have a footprint of around 80 m x 65 m (5,200 m^2). A small temporary laydown area may also be used immediately north of the construction compound (NGR ND296699) (**Figure 3.1**). This would be used only for the temporary laydown of deliveries, plant and construction equipment which may need to be temporarily stored before being transported onto site.

60. A temporary solar construction compound would be required for the construction of the proposed solar arrays. The compound is located at NGR ND290713 and would have a footprint of around 50 m x 50 m (2500 m^2).

61. The windfarm construction compound and solar construction compound would contain the following:

- temporary modular building(s) to be used as a Site office;
- welfare facilities;
- parking for construction staff and visitors;
- reception area;
- fuelling point or mobile fuel bowser;
- secure storage areas for tools; and
- waste storage facilities.

62. Crane hardstanding areas, along with the construction and maintenance compound, would be used for laydown during construction. Water would also be required for welfare facilities and to dampen track during dry weather. However, this would be minimal and would likely be collected via rainwater harvesting.

3.3.6 Materials Sourcing and Waste Management

63. For construction, the proposed Development would require a range of materials (e.g. stone for access tracks, the construction compounds and the control building compound). Excavated material from the turbine bases and access tracks would be used onsite for restoration/reinstatement. An onsite concrete batching may be required, the alternative would be to deliver concrete to site.

64. A Site Waste Management Plan would be developed for implementation during construction, as discussed in the CEMP (**Technical Appendix 3.1**). This outlines details of the materials requirements and waste generation during construction and how the Applicant intends to consider the management of these aspects.

3.3.7 Temporary Peat Storage

65. Temporary storage of peat would be avoided wherever possible by transporting the peat to an allocated reuse location as soon as practicable following excavation. This would help to retain its structural integrity, minimise volumes of peat requiring storage and would help to prevent the peat drying out. It is important, both for the peat itself and for the surrounding environment, that the peat is not allowed to substantially erode or become dry while it is stored. Procedures to control the hydrology of stored peat would be covered by the CEMP (the outline CEMP is provided in **Technical Appendix 3.1**) and the PMP, including proposals for onsite peat reuse (**Technical Appendix 10.2**). The detail for peat storage areas and dimensions would be determined when site work has commenced, and the peat condition and requirements are better understood.

3.3.8 Site Restoration

66. Excavated soil and peat would be used in site restoration and rehabilitation at the end of the construction period, in order to promote fast re-establishment of vegetation cover on worked areas and areas of bare soil or peat that are not required for the operational phase of the proposed Development. Some of the excavated peat would be reserved for peatland restoration in parts of the development area. Soils and peat would be stored for as short a time as practicable, in order to minimise degradation through erosion and desiccation.

67. Further detail on Site restoration would be provided within the CEMP, an outline of which is provided in **Technical Appendix 3.1**.

3.3.9 Environmental Management and Good Practice Construction

68. The construction of the proposed Development would be based on the adoption of good practice, supported by robust project management and the supervision of an ECoW. Details of the good practice and the role of the ECoW is set out in the outline CEMP (**Technical Appendix 3.1**). Good practice includes the adoption of Pollution Prevention Guidelines and replacement Guidance for Pollution Prevention. The services of other specialist advisors would be retained as appropriate, such as an Archaeological Advisor, to be called on as required to advise on specific environmental issues. The Principal Contractor would ensure construction activities and procedures set out in the CEMP are carried out in accordance with the mitigation measures outlined in this EIA Report and any planning conditions, and this would be monitored by the Applicant and the ECoW.

69. To ensure all mitigation measures outlined within this EIA Report are carried out onsite, contractors would be required to develop a CEMP which would form an overarching document for all site management requirements, including:

- a Traffic Management Plan;
- a Construction Methodology Statement;
- a Pollution Prevention Plan (including monitoring, as appropriate);
- a Site Waste Management Plan; and
- a Water Management Plan.

3.4 Operation and Maintenance

70. The proposed Development would operate for the duration of its planning consent as a renewable energy development. Should consent be granted it is anticipated that there would be a condition which would deal with the requirement to remove any part of the proposed Development if they cease to operate for a defined period of time.

3.4.1 Electricity Generation

71. The wind turbines would start to generate electricity at wind speeds of around 3 m/s. Electricity output would increase as the wind speeds increase up to a maximum of around 15 m/s, when the wind turbines would reach their maximum capacity. The turbines would continue to operate at maximum capacity up to wind speeds of around 25 m/s when they would begin to pitch the blades out of the wind and come to a gradual stop as a safety precaution.

72. The solar array would generate power during the hours of daylight. Battery storage would respond to the need of the national grid and would start operating once connected to the Site substation and grid connection. A letter from the Scottish Government's Chief Planner, dated 27 August 2020, confirmed that the Scottish Government view that a battery installation generates electricity and is therefore to be treated as a generating station.

3.4.2 Lighting

73. Wind turbines would be less than 150 m to blade tip and, therefore, would not require aviation lighting to comply with CAA requirement in accordance with Article 219 of the Air Navigation Order which comes into effect at 150 m.

74. The Ministry of Defence was consulted during the Site design phase and at the scoping stage and no objection was raised. It requested that the perimeter turbines be fitted with 25 candela omni-directional red lighting or infrared lighting with an

optimised flash pattern of 60 flashes per minute of 200 ms to 500 ms duration at the highest practicable point. The Highlands and Islands Airports Ltd were consulted at scoping and raised no issues regarding aviation lighting.

75. There would be permanent lighting installed as part of the control building. Detailed design of the control building has not been conducted at this stage (**Figure 3.8** shows an indicative elevation of the control building). It is expected that planning permission would include a planning condition requiring the submission and approval of the detailed control building design prior to commencement of works.

3.4.3 Maintenance

76. The proposed Development would be maintained throughout its operational life by a service team comprising up to four full time equivalents made up of operation management, operations technicians and support functions. During periods of scheduled maintenance up to four technicians who may be based in the local area would be required for up to seven weeks per year, whilst additionally the technicians would be required to undertake unscheduled maintenance throughout the year. This team would either be employed directly by the Applicant, maintenance service provider or by the turbine and solar panel manufacturers. Management of the proposed Development would typically include wind turbine and solar panel maintenance, health and safety inspections and civil maintenance of tracks, drainage and buildings.

77. Maintenance would involve the following:

- civil maintenance of tracks and drainage;
- scheduled routine maintenance and servicing;
- unplanned maintenance or call outs;
- HV and electrical maintenance; and
- blade and solar array inspections.

3.5 Socio-economic Benefit

78. The Applicant is committed to offering a package of community measures to local communities that would include the opportunity for community benefit payments to be made.

79. The Applicant is working with local communities throughout Scotland and is committed to offering a package of community measures to local communities that would include the opportunity for community benefit payments to be made. To date, the Applicant has voluntarily awarded over £1.36 million in community benefit funding from its Beinn Tharsuinn Windfarm to communities in the Highlands, supporting initiatives such as improving broadband provision, environmental improvements, youth activities, educational programmes, local heritage projects, community transport, and emergency and first aid resources. The Applicant also operates the recently constructed Halsary Windfarm and over their lifetime the combined community benefit contribution from Beinn Tharsuinn and Halsary is expected to be £3.4 million.

80. The Applicant would discuss with local stakeholders to identify which communities would be the appropriate 'Community Organisations' to participate in these benefits. Local communities would be kept informed about these benefits as the project progresses and, in line with Scottish Government guidance, would provide information in a timely manner so the communities are able to fully assess the opportunity. Local communities would have the flexibility to be able to choose how the money is spent and prioritise it for the things which matter most to them.

81. The proposed Development would also be liable for non-domestic rates, the payment of which would contribute directly to public sector finances. These non-domestic rates, by providing an additional revenue stream, would support the delivery of local authority services across Scotland. The non-domestic rates have been quantified in **Chapter 14: Socio-Economics, Recreation and Tourism**.

82. The socio-economic effects of the proposed Development are discussed in **Chapter 14: Socio-Economics, Recreation and Tourism.**

3.6 References

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