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1. **Introduction**

1.1 Energiekontor UK ("EKUK") propose to extend the existing Hyndburn Wind Farm located on Oswaldtwistle Moor ("the application site"). The application site lies between Haslingden Road to the north and the A6177 to the south, and is within the local authority area of Hyndburn Borough Council (HBC). The application site shown in Appendix 1 (Figure 5.1).

1.2 The proposed extension (the Proposed Development) would comprise the erection of four additional wind turbines (with a maximum height to blade tip of 122 metres and installed capacity of 8.2Mw), together with associated ancillary infrastructure including crane pads, access tracks and underground electrical cabling to connect the wind turbines to the existing sub-station. A package of habitat enhancement and management works is also proposed.

1.3 This Non-Technical Summary summarises in non-technical language the process, findings and conclusions of an Environmental Statement (ES) of the Proposed Development which supports the planning application submitted to Hyndburn Borough Council (HBC).

**Background and Process to Date**

1.4 Proposals to extend the existing Hyndburn Wind Farm were announced by EKUK in 2013 and consultations were held with the local authority, statutory consultees, interest groups and the local community to seek views on the principal of further renewable energy development at the site and the scale (number and height) of turbines.

1.5 In October 2013, EKUK requested a Scoping Opinion for future Environmental Impact Assessment ("EIA") of the proposal from HBC. The Scoping Opinion was made available in December 2013.

1.6 EKUK have considered the comments previously received and undertaken further baseline information gathering and further design assessment of options for the Proposed Development.

1.7 The ES is presented in four volumes:

- Volume 1 – Main Text
- Volume 2 – Figures
- Volume 3 – Technical Appendices
- Volume 4 – Non-Technical Summary (this document)

1.8 In summary, the ES:

- Describes the baseline environmental conditions of the application site;
- Outlines the options for development considered to date and discounted;
Outlines the design to be taken forward; and

Provides an assessment of likely significant environmental effects that may occur during construction, operation and decommissioning phases of the Proposed Development across eight (8) topic areas with assessments undertaken by technical consultants on behalf of EKUK as follows:

- Landscape character and visual amenity – LDA Design
- Ecology – E3
- Cultural Heritage – Peter Cardwell¹
- Noise and Vibration – Hayes McKenzie Partnership
- Highways and Transportation - WSP
- Water and Soils - Capita
- Infrastructure, Aviation and Shadow Flicker – Energiekontor UK Ltd
- Socio-Economic Effects – Turley Economics

¹ Specialist Cultural Heritage Consultant
2. Approach to Preliminary Environmental Assessment

2.1 The process of preparing an ES involves the compilation, evaluation and presentation of all likely significant environmental effects associated with the design of the Proposed Development.

2.2 The information will assist statutory and non-statutory consultees to understand the nature of the Proposed Development and its potential effects on the receiving environment and, in turn, to formulate views on its acceptability.

2.3 The approach adopted in the ES has had full regard to EIA law and guidance. EIA is a formal process under European and UK Regulations and Guidance and is a staged process requiring the inclusion of information on:

- Description of development.
- Outline of main alternatives studied.
- Description of the aspects of the environment likely to be significantly affected by the Proposed Development including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets including architectural and archaeological heritage, landscape and the inter-relationship between such factors.
- A description of the likely significant effects of the Proposed Development on the environment including direct and indirect effects, secondary and cumulative effects, short/medium/long term, permanent and temporary, and positive and negative effects of the development as a result of the existence of the development, use of resources, and any waste/pollutants produced.
- A description of measures to prevent, reduce or offset any significant adverse effects on the environment (also known as mitigation).

2.4 Each chapter of the ES prepared by EKUK provides information on:

- The study area that is to be assessed for potential effects, which may be wider or different to the application site
- The method of gathering preliminary baseline information on the study area and the characteristics of the information, e.g., desk top research or surveys undertaken and the results.
- The relevant policy context
- The methods by which the “significance” of environmental effects or impacts is confirmed. Where possible regard is had to specific policy or accepted standards for the assessment of impacts and each chapter defines what amounts to a “significant environmental effect”
• Assessment of the potential impacts during construction, operational and decommissioning phases of the Proposed Development.

• Assessments of likely significant cumulative effects, including having regard to other proposals for development including other wind farms and wind turbines that are in operation, have planning permission or are planned.

2.5 For consistency across chapters, baseline conditions as at Spring 2014 have been used in the preliminary assessment. Baseline conditions include the presence of the twelve (12) turbines at the existing Hyndburn wind farm and its ancillary infrastructure, and 13 other operational wind farms/wind turbines within 35 km of the application site, with the exception of noise and vibration from the existing turbines which is excluded from background noise measurements by national guidance.
3. Relevant Legislation, Policy and Guidance

3.1 The planning application will be determined by HBC. As required by planning law\(^2\) the application will be determined in accordance with the development plan unless material considerations indicate otherwise.

3.2 At the time of the preparation of the ES the Development Plan comprised:

- The saved policies of the Hyndburn Local Plan (adopted 1996) of relevance to the application proposals
- The Hyndburn Core Strategy (adopted 2006)

3.3 Other material considerations include:

- Planning Practice Guidance (PPG) (2014)
- Overarching NPS for Energy – EN1 (2011)
- NPS for Renewable Energy Infrastructure -EN3 (2011)

3.4 The Core Strategy has a clear desire to ensure that new development is energy efficient and seeks to reduce the emissions of greenhouse gases where possible. It also includes a policy (ENV5) which supports renewable energy proposals provided they meet specific criteria, including the need to successfully mitigate the impacts of development on air quality, noise and ecology and the need to ensure the avoidance of unacceptable harm to landscape character / visual amenity.

\(^2\) Section 38(6) of the Planning and Compulsory Purchase Act (2004)
3.5 Broadly speaking the NPSs reflect the Government’s Annual Energy Statement (July 2013) which contains the objective to meet key goals on carbon emissions reductions, energy security and affordability and the legally binding target to cut greenhouse gases by at least 80% by 2050.

3.6 Furthermore, the need for new renewable energy infrastructure projects is accepted. It is confirmed that substantial weight should be given to the contribution a project makes towards satisfying need when considering a planning application.

3.7 Onshore wind energy is also recognised as the most well established and currently most economically viable source of renewable electricity for future large scale deployment in the UK.

3.8 The aforementioned National Policy Statement’s also provide detailed guidance on a range of topic areas against which proposals should be assessed including biodiversity, aviation and defence, flood risk, historic environment, landscape character and visual amenity, land use, noise and vibration, socio-economic, traffic and transport, waste management and water resources.

3.9 Wider government statements and legislation is also relevant in the support for renewable energy proposals and reducing emissions and are fully reviewed in the ES.
4. Preliminary Consideration of Alternatives

4.1 There is no requirement under the law relating to EIA for an applicant to consider alternatives. However, where an applicant has considered alternatives the EIA Regulations require that the ES contains an outline of the main alternatives which have been considered by the applicant and an indication of the main reasons for the applicant's choice.

4.2 In light of the legislative framework outlined above allied to the consideration that the Proposed Development is for an extension to an existing windfarm in an area of good wind resource, EKUK have not considered alternative locations for the Proposed Development. This approach was not opposed by the HBC nor by any statutory consultees in responding to the previous consultation.

4.3 EKUK have, however, considered a number of alternative configurations for the Proposed Development leading up to the design presented in the ES.

4.4 The consideration of alternatives has been informed by an understanding of key environmental constraints such as ecological receptors, aviation infrastructure and the need to ensure that the impact on residential amenity is minimised in respect of noise, shadow flicker and visual effects. The iterative design process has also hard regard to feedback from stakeholders during pre-application consultation.

4.5 The ES provides details of three alternative layouts considered by EKUK before defining the preferred option for which planning permission is requested. In summary the scale of the proposed extension has been progressively reduced from an additional twelve turbines to the present proposal for an additional four.
5. **Description of Application Site and Proposed Development**

**The Application Site**

5.1 The application site is located approximately 2.1km east of Belthorn, 2.2km south of Oswaldtwistle and 11km south east of Blackburn. It is accessed from Haslingden Road which links to the M65 Motorway, 4km to the west.

5.2 The land is predominantly in agricultural use and is tenanted by three farmers and is used for the grazing of sheep and cattle.

5.3 The application site is not within any international or national ecological designations but parts of the existing wind farm site have been designated as a Biological Heritage Site and the ecological sensitivity of the area has been a key consideration in the design and layout of the proposals.

5.4 Access to the application site and the existing Hyndburn Wind Farm is via an existing access track at its junction with the Haslingden Road [B6236]. There is a number of existing access tracks to the existing turbines. The Rossendale Way runs along the steep scarp slope to the south of the site and other footpath cross the land.

**The Proposed Development**

5.5 The design of the Proposed Development has followed an iterative design process informed by Environmental Impact Assessment and consultation with relevant key stakeholders.

5.6 The Proposed Development is illustrated in Appendix 1 (Figure 5.2) and comprises:

- The erection of four (4) no. additional wind turbines and external transformer housings.
- Proposals to connect the turbines to the National Electricity Grid – including ancillary infrastructure such as access tracks, crane pads, underground cabling, construction compound.
- A package of habitat enhancement measures which will be targeted at the restoration and subsequent management of an area of Oswaldtwistle Moor which is located immediately adjacent to the application site.

5.7 Permission will be sought for the turbines for a temporary period of twenty five (25) years, therefore decommissioning would be likely to commence in 2041 (dependent upon the date of the first exportation of electricity from the Proposed Development to the National Grid). The existing Hyndburn Wind Farm is to be decommissioned in 2037. The planning application seeks permission to retain those elements of the ancillary infrastructure associated with the existing wind farm (i.e. some of the access tracks) that need to be retained on site between 2037 and 2041 to facilitate the continued operation
of the proposed development. A plan of the ancillary infrastructure elements to be retained on site is presented at Appendix 1 (Figure 5.2).

5.8 Further details of the elements of the Proposed Development is provided in the ES and summarised below:

**Wind Turbines**

5.9 The four (4) wind turbines will have a maximum height to blade tip of 122m. They will be of a conventional design with a tower, rotor hub, and three blades. The turbines will have a total installed capacity of up to 8.2MW. A typical wind turbine is illustrated in Appendix 1 (Figure 5.8)

**Transformer Housing**

5.10 As per the original scheme it will be proposed to use external transformer housing for each turbine. This simplifies the amount of infrastructure within the turbine and makes maintenance easier. Typical elevations of a transformer housing are shown in Appendix 1 (Figure 5.9)

**Crane Pads**

5.11 Each turbine will have a crane pad measuring 45m x 25m in diameter located adjacent to the turbine base.

**Turbine Foundations**

5.12 The turbine foundation bases will typically measure 18m x 18m and 3m in depth. The type of foundation specification will be informed by site conditions and the depth of peat (where applicable) in individual turbine locations.

**Vehicular access**

5.13 The existing access to the wind farm from Haslingden Road will be used for construction of the Proposed Development.

5.14 Within the application site, the proposed wind turbines will be accessed via some of the existing access track network and a network of new access tracks. In total approximately 697m of new access track will be constructed. Some of the existing tracks will be retained after the decommissioning of the existing wind farm in 2037 to facilitate continued access to the additional four turbines and to facilitate on-going agricultural or land management operations by the landowner (as shown in Appendix 1).

**Underground Cabling and Control Building**

5.15 Additional underground cabling will connect the new turbines to the existing control building on a separate electrical circuit to that presently existing. The additional four turbines will share the connection to the national electricity grid network presently enjoyed by the existing turbines. The proposed network of electrical cabling will follow the line of the access tracks. The existing control building on site will be retained for the lifetime of the Proposed Development.

**Construction compound**

5.16 The location of the temporary construction compound will be consistent with the compound that was erected for the erection of the existing turbines on site. The
compound will extend approximately 50m x 30m. The arrangement of the construction compound is shown in Appendix 1 (Figure 5.4)

**Habitat Enhancement and Monitoring Strategy (HEMS)**

5.17 A key component element of the proposed development is a commitment to the implementation of a package of further moorland restoration and habitat enhancement works.

5.18 The restoration proposals are identified within a Habitat Enhancement and Monitoring Strategy and are, individually, much larger projects than many of the restoration tasks undertaken in association with the existing wind farm. In addition an extensive monitoring programme will be agreed with the relevant stakeholders.

**Construction**

5.19 It is assumed that the construction of the proposed wind farm extension will commence within 6-12 month following the grant of planning permission (i.e. by spring 2015). Construction will be undertaken over a period of approximately 8 months.

5.20 The indicative phasing of works comprises:

5.21 The following general sequence of works will be followed for the construction of the wind farm:

- Establish Site Compound and Mobilise Plan and Workforce;
- Construct Access Tracks and Drainage;
- Construct Crane Hardstandings;
- Construct Wind Turbine Bases;
- Install Cabling;
- Install Wind Turbines;
- Landscaping and demobilisation.

5.22 Construction hours are proposed as 07:00 to 19:00 on Monday to Friday inclusive and 07:00 to 14:00 hours on Saturdays, with no construction work on-site on Sundays or Bank Holidays.

**Decommissioning**

5.23 It is anticipated that the land will be reinstated to original baseline condition wherever possible.
6. Landscape Character and Visual Amenity

6.1 The Landscape and Visual chapter of the ES identifies and describes the likely significant landscape character and visual amenity effects of the Proposed Development.

6.2 The assessment focuses on a 20km radius study area centred on the application site, reflecting the extent of potential significant effects. The assessment also considers the potential for cumulative effects with other wind farm developments within 20km radius study area. This is known as the Zone of Theoretical View (ZTV) and has been agreed with the local authority.

6.3 Within the extent of the study area the assessment considered effects both during construction, operation and decommissioning.

6.4 The application site is situated within the Moorland Hills landscape type (West Pennine Moors character area) on Oswaldtwistle Moor, which is already influenced by the presence of the existing Hyndburn turbines on the moor. The area consists of existing field boundaries (combination of stone walls, hedgerows, and fencing), semi-improved pasture, and on Oswaldtwistle Moor, a mix of blanket bog, wet heath and acid grassland with scattered sphagnum pools, drainage ditches and areas of rush dominated vegetation. A number of visual receptors in the vicinity of the site include the settlements of Belthorn, Oswaldtwistle, Accrington and Hoddlesden, a number of residential properties, local roads including the B6232 and B6236, the Rossendale Way Long Distance Footpath, National Cycle Route 6, public rights of way, areas of open access land and Green Haworth Golf Club.

6.5 The findings of the assessment indicate that due to the presence of the existing Hyndburn turbines on the moor (12 no.) the addition of four (4 no.) turbines would result in small scale landscape character effects. These effects would be limited to small areas approximately 0.5km to the north and 1.2km to the south of the turbines and would not be significant in EIA terms. The remaining character types and areas within 5km were also assessed and were found to experience negligible effects which are not significant in EIA terms.

6.6 In terms of visual effects, the addition of four additional turbines would result in Medium-Small scale visual effects to the south of the application site extending up to 1.2km and including a short section of the Rossendale Way. Elsewhere, effects would typically be Negligible as the Proposed Development would form a very limited change in views. These effects are not significant in EIA terms.

6.7 Following decommissioning of existing twelve turbines in 2037, the landscape which they occupy would be restored to its original condition leaving the four turbines in place for a period of 4 years. Therefore effects of the Proposed Development on the host landscape type would be a minor reduction from those experienced for sixteen turbines, and would not be significant in EIA terms on landscape character. Similarly, effects on landscape designations would also not be significant in EIA terms due to limited visibility.
and distance. The layout of four turbines would be slightly more widely spaced than a single development of four turbines might have been if that had been the initial design rather than an extension, but would present a coherent and well-spaced layout in most views. The visual effects resulting from the reduction from sixteen to four turbines would not be significant in EIA terms.

6.8 With regards to residential amenity, only one property lies within 750m of the proposed turbines; Brewer Lot Farm, which is financially involved. Whilst the addition of four additional turbines would increase the number of turbines seen at close proximity from this property, it would not fundamentally change the outlook that will already feature turbines visible close to the property. All properties currently have views of the existing twelve turbines on the moor. The addition of four additional turbines would not result in any noticeably greater or different visual effects on residential amenity. None of the properties will be affected to the extent that the turbines are sufficiently “oppressive” or “overbearing” that the property would be rendered an unattractive place in which to live.
7. Ecology

7.1 Ecological surveys have been carried out in relation to the Proposed Development between 2012 and 2014 and pre-application consultation has been carried out with local record-holding organisations, Natural England and the Royal Society for the Protection of Birds (RSPB).

7.2 The ecological survey area comprises Oswaldtwistle Moor to the south with enclosed pasture to the north. The majority of the infrastructure of the existing Hyndburn Wind Farm stands within Oswaldtwistle Moor with two turbines standing within the agricultural land to the north. The additional turbines within the Proposed Development will be positioned within habitats of low to parish value ranging from low value semi-improved acid grassland and rush pasture to a matrix of acid grassland, heath and blanket bog habitat. The design of the Proposed Development has sought as far as practical to avoid areas of deep peat and higher value bog habitats.

7.3 The moorland within the survey area has become degraded because of historic management practices. Habitat restoration works are on-going at the site in relation to the existing Hyndburn Wind Farm including exclusion of grazing from the moorland, dam blocking and peat translocation. Monitoring surveys indicate that as a result of restoration works completed to date the moorland is progressing to a more favourable condition from the perspective of its biodiversity and hydrology.

7.4 The surveys have found that badger may forage within the survey area at times and that the survey area is of low value to the local bat population (used at low levels by small numbers of locally common species). The survey area is also considered to be of local to parish value to reptiles with adder, common lizard and slow worm considered present or likely to be present in small numbers. Finally, the survey area has been found to be of a local conservation value for its wintering bird assemblage and of county value for its breeding bird assemblage, principally due to the presence of breeding golden plover and other upland waders.

7.5 It is predicted that the Proposed Development will not have a significant effect on these receptors. The layout of the site has been designed to ensure no direct effects on habitats of greater than parish value and the proposal includes further targeted moorland restoration works which aim in conjunction with existing restoration works to return the moorland within the survey area to favourable condition such that the overall effect of the proposals on habitat will be beneficial.

7.6 The moorland restoration proposals, in conjunction with proposals for sympathetic management of in-by land to the north of the wind farm are also predicted to have a beneficial effect on key bird species. Works are likely to increase the carrying capacity of the survey area to a number of species, particularly upland waders, potentially increasing the value of the survey area to national or international levels.

7.7 Construction and de-commissioning works will be undertaken to appropriate working methods to minimise the risk of key species being harmed or disturbed during works and to ensure the risk of indirect effects on habitats is minimised.
7.8 It is proposed to undertake monitoring surveys of the breeding bird population and also of moorland habitats post-construction in order to inform on-going site management and restoration works.
8. Cultural Heritage

8.1 The cultural heritage assessment addresses the potential direct (physical) effects of the Proposed Development upon archaeological remains together with the indirect (visual) effects upon the setting of designated heritage assets, and specifically Scheduled Monuments, Listed Buildings and Conservation Areas.

8.2 There are no World Heritage Sites, Registered Parks and Gardens or Battlefields within 5km of the Proposed Development, and no Scheduled Monuments within 3km.

8.3 No certain sites or finds of prehistoric, Roman or medieval date are recorded on Oswaldtwistle or Haslingden Moors within the vicinity of the Proposed Development, although the site of a probable Bronze Age stone circle is located on Thirteen Stone Hill to the east. A possible Bronze Age round barrow (burial mound) may be located on the summit of a hummocky moraine on Dry Hill.

8.4 The predicted direct physical effects of the construction of the Proposed Development upon archaeological remains would be limited to that of the construction of turbine foundations and associated crane pads or access tracks (principally turbine New T1) upon former field walls, drains, gullies and a possible trackway. All of the identified impacts would be upon parts of more extensive features of post-medieval date and low sensitivity, and could be mitigated by means of archaeological survey in advance of construction and a ‘watching brief’ during construction groundworks. The effects would accordingly be of no more than minor significance.

8.5 Excavation of the deeper peat for turbines New T3 and New T4 would have a limited impact upon the information about past environments contained within the deposits, but would be upon a small part of a much more extensive resource upon which detailed investigation and analysis has already been undertaken in relation to the construction of the existing wind farm.

8.6 Subject to the development being granted consent, the scale and scope of the mitigation would be agreed with Lancashire County Archaeological Service on behalf of the planning authority.

8.7 There are seven Listed Buildings and three Conservation Areas located within 3km of the proposed development. As the extension turbines would be seen within the context of the existing wind farm, the predicted effects upon the setting or significance of Listed Buildings, including cumulative effects with other wind energy developments, would be negligible and limited to those upon the Church of St Immanuel, Rough Heys Farmhouse and Farm Cottage, and Jackhouse Farmhouse. The impact on these Listed Buildings would be moderate to minor (for the Church of St Immanuel) or minor, long-term and reversible. The predicted impact upon the character, appearance or setting of Conservation Areas would be negligible and limited to that upon the Rhyddings Conservation Area, and restricted to that upon one key view along Union Street near the War Memorial. The impact would be minor, long-term and reversible.

8.8 The decommissioning of the Proposed Development would have no direct physical impacts upon archaeological remains as all areas would have been previously affected
by construction works and the predicted effects adequately mitigated. Any predicted effects upon the settings and significance of Listed Buildings and Conservation Areas would be reversed.

8.9 Subject to the implementation of the mitigation measures proposed it is considered that the effects of the Proposed Development upon heritage assets would not be significant.
9. Noise and Vibration

9.1 Noise predictions for the Proposed Development operating in conjunction with the existing Hyndburn Wind Farm have been carried out. These consider the operational predicted noise levels for REpower MM82 turbines on the proposed development site as well as on the existing wind farm.

9.2 This is provided in the form of noise contour lines in accordance with ETSU-R-97, as referred to within the ‘National Policy Statement for Renewable Energy’ (EN-3) and the guidance within ‘A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise’ (GPG) published by the UK Institute of Acoustics.

9.3 The predicted cumulative noise levels will be within daytime and night time noise limits at all residential properties except at the Coach and Horses Public House. This premise will experience a 1 dB exceedance at night caused by the addition of a small amount of noise from the Proposed Development to higher levels of existing noise. This overall increase of the wind farm noise levels is unlikely to be perceptible. In practice it will be possible to mitigate this by running the closest of the operational wind turbines in its lowest noise mode for downwind propagation from the site for the night hours.

9.4 At such time as the existing Hyndburn Wind Farm may cease to be operational, operational noise impact from the Proposed Development will be lower.

9.5 Noise during the construction and de-commissioning phase will arise from the construction of the turbine foundations, the erection of the turbines, the excavation of trenches for cables, and the construction of associated hard standings, access tracks, and temporary construction compound. Noise from vehicles on local roads and access tracks would also result from the delivery of turbine components and construction materials.

9.6 Although noise levels from construction and decommissioning are expected to be below the 65 dB LAeq daytime significance criterion, there would be periods when noise from construction activities, would be clearly audible at properties close to the associated activity. The increase in road traffic during the construction/de-commissioning phase is predicted to have no significant impact.
10. Highways and Transportation

10.1 The potential highway and transportation impacts of the Proposed Development during the construction, operation and decommissioning phases has been assessed, taking into consideration all relevant national, regional and local policy requirements.

10.2 The ES has reviewed the estimated impact of construction traffic upon the local and wider highway network considering traffic movements related to abnormal loads (oversized vehicles delivering turbine components) and delivery of construction materials.

10.3 A number of potential delivery routes have been assessed and a preferred route determined which assumes the same routing (Route 1) agreed under the planning consent for the existing wind farm. The assessment has assumed any deliveries to the site would be strictly managed, both in terms of route choice and the timing of deliveries scheduled as far as possible to occur outside peak periods.

10.4 The assessment has focused upon existing/baseline traffic data within a defined study area and the anticipated level of traffic associated with each phase of the Proposed Development in order to establish percentage increase in traffic.

10.5 The assessment has concluded that the principal effect would be felt for a temporary period during the first six months of the construction period with a peak of 17 HGV movements per day during month two.

10.6 The highest percentage increase in HGV movements was identified along the B6236 which was calculated as a 47.2% increase (but less than 1% increase in total traffic). However, this is considered to be a worst case estimation based on all vehicle movements being articulated HGVs.

10.7 Currently the number of existing HGV movements on the B6236 is only 36 per day, which inflates the HGV impact of the development proposals and is not considered significant. The other three routes at no time experience any increase in HGV movements of over the 30% threshold for further assessment.

10.8 Based on guidance, the assessment has concluded that the increase in vehicular traffic during all identified phases of the Proposed Development would not be significant and as such, the short-term, medium-term, and long-term effects would be negligible.

10.9 Although the assessment has concluded that the increase in traffic volume would not give rise to any significant effects, a number of mitigation measures are proposed to be take forward such as the implementation of a Traffic Management Plan for the construction period.
11. Water and Soils

11.1 The Water and Soils chapter assesses the potential impacts of the Proposed Development on soils and water (including surface water and groundwater).

11.2 The study area for the assessment includes the application site itself and land surrounding the application site so as to include the potential effects on adjacent features. Data for the assessment was collected from a number of sources including online information and from site during regular site visits undertaken prior to and since the construction of the existing wind farm.

11.3 The assessment found pathways from the Proposed Development to eight water and soils features. The potential impacts from the Proposed Development on these features were not found to be significant. In addition the assessment has found that the wind farm will have minor beneficial impacts on the water and soils environment through the implementation of various habitat restoration and enhancement measures.

11.4 The assessment has not found that there are likely to be any significant cumulative impacts from the wind farm extension on the water and soils environment when considering the combined effects of pending planning applications and the wind farm extension.

11.5 Monitoring of water levels and water quality will continue as part of the on-going monitoring of the existing wind farm. The resolution of this monitoring programme will be reviewed to determine whether it adequately covers the Proposed Development. In addition, hydrological monitoring of Lottice Brook will be implemented to cover the construction and decommissioning stages of the Proposed Development in order to monitor the impact of the Proposed Development during these stages on the levels of radioactivity within the watercourse.
12. Infrastructure, Aviation and Shadow Flicker

12.1 The Infrastructure, Aviation and Shadow Flicker chapter has assessed the potential impacts that may result from the Proposed Development in terms of their effects upon infrastructure and aviation assets, and properties in respect of shadow flicker.

12.2 The Proposed Development has been assessed in terms of its potential effects upon microwave and telecom links, gas pipelines, National Grid infrastructure, television reception, and the Met Office radar; and has found no significant effects. In summary:

- The layout has been designed to ensure that there are no impacts upon any existing microwave and telecom links due to suitable distances from those which have been identified by the link operators.

- It is anticipated that any television reception inference would affect the same households (c. 100) whom did not take up the offer of mitigation as part of the existing wind farm. It is considered that the impact on television reception in these 100 homes is already being experienced and none have made contact with the applicant.

- The existing development of 12 turbines is likely to already affect the Hameldon Hill radar. It is likely that the Met Office manage these clutter effects. The proposed development of 4 additional turbines is likely to increase the amount of wind farm clutter but it is considered that the processes used to manage the existing clutter effects could be extended to manage the effects of the proposed new turbines. The net operational impact of the proposed additional turbines is likely to be small, because of the effects of the existing 12 turbines.

12.3 A shadow flicker assessment was undertaken based on a 2050m calculation zone. The effect of the existing 12 turbines is compared with the cumulative effect of the existing and proposed 4 new turbines. It is predicted that nine receptor locations may be exposed to weak shadow flicker of low significance. Mitigation is unlikely to be required, except in the case of one receptor which is financially involved in the scheme.

12.4 In terms of aviation infrastructure, the proposed wind farm extension is already surrounded by other sources of radar clutter, the incremental cumulative effect is expected to be minor to insignificant. It is likely that vectoring of air traffic will almost certainly be managed as to avoid the existing wind farm and therefore the proposed extension. In any case, where impacts do occur, the interests of aviation service providers will be protected, where necessary, through the provision of mitigation technologies and planning conditions.

Telecommunication links

12.5 The layout has been designed to ensure that there are no impacts upon any existing telecommunication links due to suitable distances from those which have been identified by the link operators.
Gas pipelines or other National Grid infrastructure

12.6 A ‘Linesearch’ enquiry undertaken by the applicant in November 2013 identified no assets within the 2km search area. There will be no impact on gas pipelines or National Grid Infrastructure.

Television reception

12.7 Due to the levels of interference to television reception from the Winter Hill transmitter already being received and the quantity of mitigation already carried out it is considered that the vast majority of viewers in the affected areas are no longer opting to receive their television services from the Winter Hill transmitter, but instead are re-aligned to the Haslingden transmitter or utilising ‘Freesat’ for the television services. As such it is anticipated that approximately 100 households, located within the existing areas, who did not take up the original offer of mitigation would likely to have reception issues once the proposed extension is constructed. It is considered that the impact on television reception in these 100 homes is already being experienced and none have made contact with the applicant.

Shadow flicker

12.8 Shadow flicker is not usually critical. However, in unusual circumstances, where the calculations indicate that occupied dwelling houses would be significantly affected, a condition requiring the non-operation of turbines at times when predicted shadow flicker might adversely impact on any inhabited dwelling within 500m of a turbine may be appropriate. Conditions may also address limits on the number of hours per year or minutes per day that the shadow flicker should affect an inhabited dwelling.

Aviation

Warton PSR

12.9 It is considered that in this circumstance, where the proposed wind farm extension is already surrounded by other sources of radar clutter, the incremental cumulative effect is expected to be minor. It is likely that vectoring of air traffic will almost certainly be managed as to avoid the existing wind farm and therefore the proposed extension.

St Annes PSR and Manchester PSR

12.10 The addition of new clutter sources would be within an area of clutter that is already managed operationally. The number of detectable turbines being proposed is smaller than the number of turbines already detectable within the development. The increase in radar clutter due to the proposed extension will not significantly increase the area of the screen that is already affected but it is considered unlikely that this would be considered operationally significant from a distraction point of view. The impact on re-routing options for aircraft avoiding the area of clutter will be no impact for the St Annes radar and minimal impact for Manchester Airport. Overall it is considered unlikely that the proposed extension will be operationally significant to NATS.
Blackpool PSR

12.11 The addition of new clutter sources would be within an area of clutter that is already managed operationally. The increase in radar clutter due to the proposed extension will marginally increase the amount of clutter within an area of the screen that is already affected. It is considered unlikely that this would be considered operationally significant from a distraction point of view. There will be no impact on re-routing options for aircraft avoiding the area of clutter. Overall it is considered unlikely that the proposed extension will be operationally significant to Blackpool Airport.
13. Socio Economic

13.1 The Socio Economic chapter describes the economic and social effects which might arise as a result of the Proposed Development.

13.2 The assessment has established that it is expected that the Proposed Development will generate beneficial socio-economic impacts within the local study area of Hyndburn, and across the wider North West region and UK.

13.3 The primary beneficial impacts relate to direct, indirect and induced employment and economic productivity (GVA) estimated to be generated by the Proposed Development across the phases of its lifecycle from construction through to operation and subsequent de-commissioning.

13.4 It is not expected that the Proposed Development will generate any significant impact on population and demographics within the study area. Hence its likely impact is deemed negligible.

13.5 It is not expected that the Proposed Development will generate any significant impact on tourism and recreation activity within the study area. There remains limited evidence regarding the impact of wind farms on tourism and recreation. Recent research concludes that wind farms have little influence, either positively or negatively, upon the decision making of tourists and visitors to an area.

13.6 Moreover, with specific regard to the Proposed Development, it is likely that any potential visitor interest in a wind farm at the application site is likely to have been exhausted as a result of activity related to the existing Hyndburn wind farm. It is concluded that there will be a negligible impact and no significant effect on local tourism and recreation activity arising from Proposed Development.

13.7 The Proposed Development will offer the potential for further wider beneficial socio-economic impacts through the commitment of the applicant to provide a community benefit fund throughout its operational lifetime.
Appendix 1: Figure Report
# Chapter 1 - Introduction

## Introduction

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<thead>
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<th>Figure 1.1</th>
<th>Site Location Plan</th>
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<td>Figure 1.2</td>
<td>Site Layout @ AO 1:2500</td>
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</tbody>
</table>
Figure 1.1 Site Location Plan

**KEY:**
- Blue: Land under control of the applicant
- Red: Application boundary

**Turbine easting northing**

<table>
<thead>
<tr>
<th>Turbine</th>
<th>Easting</th>
<th>Northing</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>374,536</td>
<td>424,706</td>
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<tr>
<td>T2</td>
<td>374,281</td>
<td>424,430</td>
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<tr>
<td>T3</td>
<td>374,361</td>
<td>423,915</td>
</tr>
<tr>
<td>T4</td>
<td>374,764</td>
<td>423,951</td>
</tr>
</tbody>
</table>
Figure 1.2 Site Layout A

KEY:
- Land under control of the applicant
- Application boundary
- Existing turbine
- Proposed extension turbine
- Existing track
- Proposed additional track
- Temporary construction compound
- Crane hard standing
- Existing substation

Turbine
easting
northing
T1 374, 536
424
T2 374, 281
430
T3 374, 361
423
T4 374, 764
951

Figure 1.2 Site Layout A
# Chapter 5 – Project Description

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<th>Description</th>
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</thead>
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<td>5.2</td>
<td>Track Layout Showing Locations of Cut/Floating Track</td>
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<td>Typical Site Track Cross Sections</td>
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<td>5.4</td>
<td>Typical Temporary Construction Compound</td>
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<td>Typical Main Crane Details</td>
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<tr>
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<td>Typical Crane Hard Standing Details</td>
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<td>5.8</td>
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<td>5.9</td>
<td>Typical Transformer Housings</td>
</tr>
<tr>
<td>5.10</td>
<td>Typical Cable Trench Construction Details</td>
</tr>
</tbody>
</table>
Figure 5.1 Site Layout

KEY:
- Land under control of the applicant
- Application boundary
- Existing turbine
- Proposed extension turbine
- Existing track
- Proposed additional track
- Temporary construction compound
- Crane hard standing
- Existing substation

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<thead>
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</tr>
</tbody>
</table>

Hyndburn Wind Farm Extension

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Figure 5.2 Indicative Track Layout Showing Locations of Cut / Floating Track

**KEY:**
- Cut track / hardstanding
- Floating track / hardstanding

**Notes**
All annotated measurements in (mm) unless stated
General notes:
Where suitable peat will be stripped in turves for later use in reinstatement.

A wearing course will be placed on top of the stone at the end of construction and will consist of compacted granular fill with a minimum particle size of 50mm. The track surface will be constructed and graded to drain into the upslope ditch.

Cross drainage will be installed at intervals along the track determined from hydrological assessment. The pipes will be placed in order to minimise any impacts on ground and surface water hydrology.

For heavily trafficked areas geogrid may be required to reinforce the fill material.

The 4.5 metre wide track will be constructed from free draining granular fill, which will be compacted by construction traffic. On lightly trafficked lengths a vibratory roller will be used.

The depth of the track construction will depend on the ground conditions and the amount of construction traffic. More heavily trafficked areas will require deeper fill.

Where suitable excavated weathered bedrock will be used in the track construction. If the material is not suitable then granular material will be used.

In some ground conditions a geotextile layer will be required beneath the layer of fill forming the site track.
Figure 5.4
Typical Temporary Construction Compound

Hyndburn Wind Farm Extension

Notes
All annotated measurements in (mm) unless stated
Figure 5.5
Typical Main Crane Details

Notes
All annotated measurements in (mm) unless stated
Figure 5.6
Crane Hardstanding

Notes
Indicative layout of crane hardstanding during erection of turbines
Figure 5.7
Typical Wind Turbine Foundation

Original ground
level ± 50 mm

Undisturbed ground
Selected top soil/turf
Selected as dug material

Elevation A-A

Hyndburn Wind Farm Extension
Proposed Max tip height of 122m

The drawing is indicative and shows an example of a standard hub height and rotor diameter for a turbine of this height.

The application seeks only a restriction on maximum tip height to allow greater flexibility in turbine choice to coincide with met mast data, ensuring the maximum use of the wind resource and characteristics in this area.
Figure 5.9
Typical Turbine Transformer Housing Elevations and Floor Plan

NOTES

Finish to be in accordance with local planning authority specification.

Locally sourced materials to be used where feasible.
Figure 5.10
Typical Cable Trench Construction Details

Single Circuit Trench

- Low permeability bunds will be built into the trenches at intervals along the alignment to prevent the trench acting as a drain.
- 250 mm topsoil / peat layer is laid on top of fill for final reinstatement.
- Two marker tape are placed at the top of the sand cover layer and at the top of the backfill layer beneath the topsoil reinstatement.
- Trench is backfilled with excavated material.
- An earthing conductor is placed on top of the sand cover layer.
- Thickness of sand bedding is 300mm.
- Cables will be laid in trefoil as shown.
- A fibre optic communications cable will be placed in the trench alongside the HV cables.

Double Circuit Trench

- Low permeability bunds will be built into the trenches at intervals along the alignment to prevent the trench acting as a drain.
- 250 mm topsoil / peat layer is laid on top of fill for final reinstatement.
- Two marker tape are placed at the top of the sand cover layer and at the top of the backfill layer beneath the topsoil reinstatement.
- Trench is backfilled with excavated material.
- An earthing conductor is placed on top of the sand cover layer.
- Thickness of sand bedding is 300mm.
- Cables will be laid in trefoil as shown.
- A fibre optic communications cable will be placed in the trench alongside the HV cables.