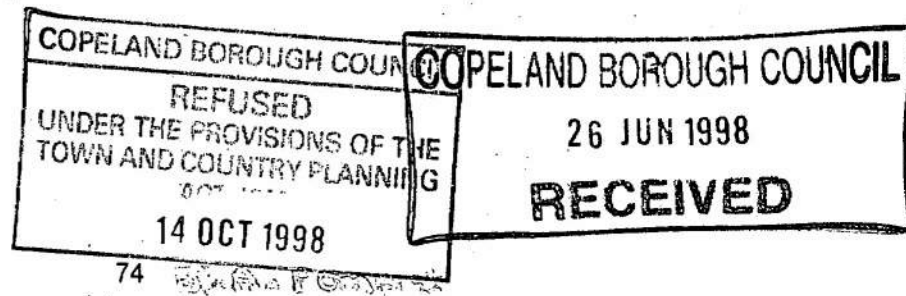


TABLE 2 - Noise level predictions for a south-westerly wind

wind speed $4.5\text{ms}^{-1}$	$L_{A90}$ (b/g)	$L_{A90}$ (wind farm)	excess
Park House	36.0	35.0	-1.0
Micklam Villa	36.0	28.7	-7.3
Micklam Farm	36.0	32.6	-3.4
Foxpit House	36.0	39.0	3.0
wind speed $5\text{ms}^{-1}$	$L_{A90}$ (b/g)	$L_{A90}$ (wind farm)	excess
Park House	36.3	35.2	-1.1
Micklam Villa	36.3	28.9	-7.4
Micklam Farm	36.3	32.8	-3.5
Foxpit House	36.3	39.2	2.9
wind speed $6\text{ms}^{-1}$	$L_{A90}$ (b/g)	$L_{A90}$ (wind farm)	excess
Park House	37.0	35.7	-1.3
Micklam Villa	37.0	29.4	-7.6
Micklam Farm	37.0	33.3	-3.7
Foxpit House	37.0	39.7	2.7
wind speed $7\text{ms}^{-1}$	$L_{A90}$ (b/g)	$L_{A90}$ (wind farm)	excess
Park House	38.0	36.2	-1.8
Micklam Villa	38.0	29.9	-8.1
Micklam Farm	38.0	33.8	-4.2
Foxpit House	38.0	40.2	2.2
wind speed $8\text{ms}^{-1}$	$L_{A90}$ (b/g)	$L_{A90}$ (wind farm)	excess
Park House	39.0	36.7	-2.3
Micklam Villa	39.0	30.4	-8.6
Micklam Farm	39.0	34.3	-4.7
Foxpit House	39.0	40.7	1.7
wind speed $10\text{ms}^{-1}$	$L_{A90}$ (b/g)	$L_{A90}$ (wind farm)	excess
Park House	43.0	37.7	-5.3
Micklam Villa	43.0	31.4	-11.6
Micklam Farm	43.0	35.3	-7.7
Foxpit House	43.0	41.7	-1.3
wind speed $15\text{ms}^{-1}$	$L_{A90}$ (b/g)	$L_{A90}$ (wind farm)	excess
Park House	51.5	40.2	-11.3
Micklam Villa	51.5	33.9	-17.6
Micklam Farm	51.5	37.8	-13.7
Foxpit House	51.5	44.2	-7.3



11.3.4 They show that under the prevailing south westerly wind, the maximum excess noise level ( $L_{A90}$ ) over the background level due to noise from the cumulative operation of all wind turbines will not exceed 3dB at any of the locations. Further data at **Appendix 9** shows that for the "worst case" of a northerly wind, the increase in levels at the nearest property will only be 4dB. For the majority of wind speeds and directions, residential properties in the locality will only experience noise from the wind farm which is at or below the existing ambient levels. For much of the time, the wind farm will therefore be barely audible.

### 11.4 POSSIBLE NOISE CONDITIONS

11.4.1 In the case of other applications for wind farm developments, Copeland Borough Council have put forward conditions relating to the noise levels arising from wind farm developments. These conditions are in agreement with the ETSU guidelines. The level of noise emissions from the combined effect of the wind turbine generators shall not exceed the greater of:

- 38dB,  $L_{A90 10min}$ , or,
- 5dB above the  $L_{A90}$  background level at wind speeds up to 10  $ms^{-1}$ .

11.4.2 In the case of Lowca, these conditions will be satisfied at all of the nearest residential properties.

11.4.3 At wind speeds in excess of 10 $ms^{-1}$  background noise levels are to be agreed with the authority. However, at this site the possibility of the noise from the turbines ever exceeding the ambient background noise levels at windspeeds in excess of 10 $ms^{-1}$  is remote.

### 11.5 THE IMPACT OF THE WINDCLUSTER

11.5.1 This development satisfies the criteria given in "The Assessment and Rating of Noise from Wind Farms", ETSU 1996 and the essentially similar conditions proposed by Copeland Borough Council for other sites. It is concluded that no noise nuisance is likely to result from the development of the site, that adequate noise conditions can be imposed and met, and that there will be no grounds for justifiable complaint.

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## 12. ELECTRO-MAGNETIC SIGNALS

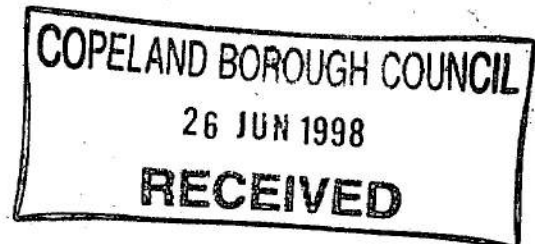
### 12.1 INTRODUCTION

12.1.1 Microwave and other electromagnetic signals are transmitted throughout the country by a wide range of operators, including both statutory agencies and commercial companies. There is potential for interference to the transmission of these signals from any large structure, including wind turbines, which may be developed close to the signal path. This section describes the existing situation with regard to the proposed site near Lowca, potential interference effects and possible mitigation measures.

### 12.2 EXISTING SITUATION

12.2.1 In order to establish the location and nature of microwave, broadcast and other radio links in the vicinity of the site, the following bodies and operators have been consulted:

- Radio Communications Agency
- British Telecom
- Mercury Communications
- Racal Vodafone
- Cellnet
- British Broadcasting Corporation
- National Transcommunications Limited
- Home Office (covering local emergency services)
- Department of Transport Navigation and Communications Branch
- Trinity House
- Ministry of Defence



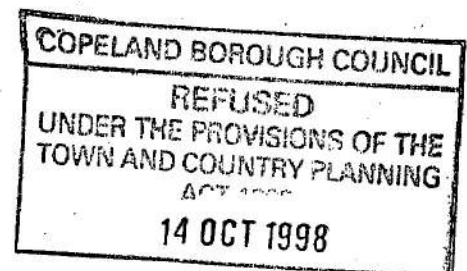
12.2.2 None of these bodies has identified any link crossing the site.

12.2.3 NTL, who are responsible for TV transmissions in the area, have confirmed that they predict no problems of interference with either rebroadcast links or domestic TV reception.

### 12.3 POTENTIAL IMPACTS

12.3.1 No potential impacts on microwave or rebroadcast links have been identified.

12.3.2 There is no predicted risk of degradation of TV transmission signals in the area.



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**13. AIR QUALITY**

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**13.1 INTRODUCTION**

13.1.1 Air quality is a cause for concern internationally, due to the levels of carbon dioxide and other pollutant gases which are released into the atmosphere as a result of burning fossil fuels. This section briefly examines the factors which are thought to influence local air quality, and the potential effect of the proposed Lowca windcluster.

**13.2 EXISTING SITUATION**

13.2.1 The Lowca windcluster site is located in a rural area, where the air quality is assumed to be good.

**13.3 POTENTIAL IMPACTS**

13.3.1 The development of the proposed windcluster at Lowca would make a significant contribution to the reduction of atmospheric pollution, though not necessarily in the immediate locality.

13.3.2 For a given level of national electricity demand, every kilowatt hour produced from a non-polluting source such as a wind turbine replaces one produced by a fossil fuel power station.

13.3.3 The impact of the proposed Lowca windcluster on atmospheric pollution can be calculated as follows.

13.3.4 Each unit of electricity produced by wind energy displaces a unit of electricity which would otherwise have been produced by a fossil fuel power station. It is therefore possible to calculate the emissions of carbon dioxide (CO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) which will be avoided if the project proceeds.

13.3.5 The Parliamentary Office of Science and Technology quotes the following:

CO <sub>2</sub>	936-1079	grammes per kilowatt hour
SO <sub>2</sub>	14-16.4	grammes per kilowatt hour
Nox	2.5-5.3	grammes per kilowatt hour

13.3.6 The following formula can then be applied:

Emission Reduction (tonnes per annum) = (A x B)/1000

where

A is the predicted site output per year

B is the avoided emission for each substance per kWh

13.3.7 The proposed scheme would generate about 16,000 megawatt hours per year. From the above calculation, it would result in the following reductions in levels of atmospheric emissions avoided:

CO <sub>2</sub>	15000- 17250	tonnes per annum
SO <sub>2</sub>	224-262	tonnes per annum
NO <sub>x</sub>	40-85	tonnes per annum

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13.3.8 The scheme would supply on average sufficient electricity for 3800 households.

13.3.9 It is estimated that the energy input required to manufacture and erect a wind turbine would be recovered from its output in approximately 6 months.

### 13.4 RESIDUAL IMPACT

13.4.1 The net effect of the proposed development would be to bring about a reduction nationally in emissions to the atmosphere by fossil fuel generating plant, for the lifetime of the project.

### 13.5 SUMMARY AND CONCLUSIONS

13.5.1 Air quality in predominantly rural area surrounding the proposed windcluster site is assumed to be generally high. However air quality is a matter of international concern, and the development of the Lowca windcluster would make a significant contribution to the reduction of atmospheric pollution, though not necessarily in the immediate locality.

13.5.2 The wind turbines proposed for the Lowca site would generate approximately 16,000 megawatt hours per year. If it is assumed that this replaces the output from conventional coal fired plant, then emissions of approximately 16,000 tonnes of carbon dioxide, 250 tonnes of sulphur dioxides and and 60 tonnes of nitrogen oxides would be avoided:

13.5.3 It is estimated that the energy input required to manufacture and erect a wind turbine would be recovered from its output in approximately 6 months.

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14. SOCIO-ECONOMIC ISSUES

14.1 INTRODUCTION

14.1.1 West Cumbria is a relatively remote geographical area of the UK in which the local economy relies on a combination of agriculture and manufacturing industry. Both activities have experienced recent uncertainty, due largely to economic depression, and to reforms in the European Community's Common Agricultural Policy respectively.

14.1.2 This section examines the contribution that the proposed windcluster could make, both directly and indirectly, towards the economic and social well-being of the local community.

14.2 EXISTING SITUATION

14.2.1 The windcluster would be located on poor quality grazing land on Park House Farm, Lowca.

14.2.2 Over-production of beef and lamb has led to the progressive withdrawal of EC subsidy over recent years. In combination with considerable fluctuations in the market price, this has resulted in a trend towards farm diversification, in order to secure income and to maintain agricultural viability.

14.3 THE POLICY CONTEXT

14.3.1 The Cumbria and the Lake District Joint Structure Plan 1991-2006 contains the following general policy:

*Policy 8 – Furness and West Cumbria*

*Furness and West Cumbria's economic problems will be addressed through an enhanced priority to refurbishment of the town centres, environmental improvements, new industrial site development, tourism projects and improvements in road and rail communications.*

14.3.2 Although the proposed windcluster development is not of a type specifically identified in Policy 8, it would assist in securing one of the aims of the policy, which is described in the preamble to the policy thus :

*"Safeguarding the long-term future of (Copeland and West Cumbria) communities is a high priority."*

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**14.4 POTENTIAL IMPACTS**

14.4.1 The development of this project would have a number of socioeconomic impacts within the local area during both the construction and subsequent operation of the windcluster. These would be largely beneficial, and include:

**Enhanced agricultural viability**

14.4.2 Windclusters are a form of farm diversification that would provide a valuable guaranteed rental income for the landowner, for the duration of the life of the wind turbines, thus increasing the viability of the farming unit. Apart from the small amount of land occupied by access tracks and the turbine towers and ancillary equipment, the land would continue to be fully available for grazing.

**Employment during the constructional and operational phases:**

14.4.3 The developer intends to place as much of the construction work as possible in the West Cumbria area. Wind Prospect Ltd, developer and managing consultant for this Environmental Statement, has an office and staff based in West Cumbria. Suitable civil and electrical contractors have already been identified and have contributed to the development of the project. Their involvement in maintenance operations would continue throughout the operational life of the windcluster.

14.4.4 It is estimated that contracts worth approximately £600,000 would be placed with local companies.

**Income to the Local Authority**

14.4.5 The development would additionally pay rates according to the national formula for wind generating plant.

**Educational Benefits:**

14.4.6 The windcluster would be of potential benefit as a educational resource for local schools and interest groups. The Haverigg, Siddick and Oldside windclusters have already proved to be of considerable educational value to nearby schools in the study of technology, sustainability and the broader issues of man's influence on the environment. In the case of Siddick and Oldside, PowerGen Renewables funded provision of a specially written Education Pack to all local primary schools, and provision of such a pack has already been discussed with Lowca School.

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**14.5 SUMMARY AND CONCLUSIONS**

14.5.1 The economy of West Cumbria, which generally relies on a combination of agriculture and manufacturing industry, has experienced recent uncertainty, due largely to economic depression, and to reforms in the European Community's Common Agricultural Policy. In order to counter this, the local planning authority seeks to encourage diversification and growth of the local economy.

14.5.2 The development of the Lowca windcluster would be consistent with this policy, and would result in a number of socio-economic effects on the local economy which would be largely beneficial. These include:

W.A. Pomfret

- Enhanced agricultural viability of Park House Farm through rental income from the windcluster.
- Local employment in both the construction of the windcluster, and in its subsequent maintenance, which would be to the value of approximately £600,000.
- Income to the local authority through liability for rates.
- Benefits of the windcluster as an educational resource for local schools.

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## 15. CONSTRUCTION

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### 15.1 INTRODUCTION

15.1.1 This section describes the likely environmental impacts of construction. Anticipated impacts arising from the works undertaken in the development of the windcluster have, where possible, been identified and suitable mitigation measures proposed.

15.1.2 Descriptions of the proposed methods of working, plant, phasing and construction processes have been based on the experience of such activities derived from the construction of the Haverigg, Siddick and Oldside windclusters. It is anticipated that the windcluster would take approximately 28 weeks to construct.

### 15.2 PRE-CONSTRUCTION WORKS

15.2.1 Prior to the main construction contract commencing, a number of enabling works would be undertaken, including:

- installing access points and gates from the existing access to Park House Farm;
- stripping and careful storage of existing topsoil from the areas which would be affected by construction activities, including the tower base, switchgear house and access track areas;
- archaeological evaluation works as outlined in **Section 9**

### 15.3 CONSTRUCTION WORKS

15.3.1 The principal components of the construction activity on site would be as follows:

15.3.2 **Access Tracks** This would involve the excavation of the tracks to 250 mm depth, laying a geotextile material on the formation surface prior to the placement of approximately 250 mm stone base and top dressing. It is proposed that the spoil is stored on site at convenient locations outside ecologically sensitive areas, for future re-use.

15.3.3 Site access points would be gated and secured and appropriate warning signs erected.

15.3.4 **Turbine Bases** The site consists of glacial till known locally as boulder clay. This forms a strong sub-base for the turbines and standard foundations should be adequate, with a possible requirement for some additional consolidation or anchoring to bedrock near the cliff edge. Precise requirements will be established by a detailed field investigation before development commences.

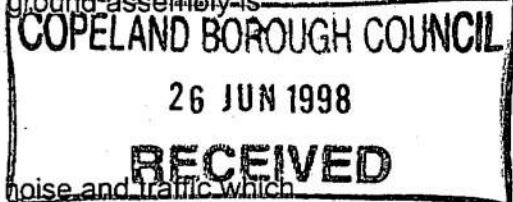
15.3.5 Construction of the standard turbine base for each machine would involve the excavation of approximately 200 cubic metres of ground material, of which 100 cubic metres would be removed off site, or placed in suitable locations within Park House Farm and the remainder stored for future use as backfill. Shuttering and steel reinforcement would then be put in place and concrete poured into the 'moulds' to form the base in-situ. The upper surface of each base would finish approximately 1 metre below ground level with either a central column with bolts to support the tower, or the base section of the tower set into the concrete.

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**15.3.6 Electrical Connections** Either prior to or during base construction, the site electrical system would be installed. This would include the underground cabling between the turbines and the point of connection to NORWEB. The switchgear building would be constructed and the necessary equipment installed at this stage.

**15.3.7** The 11 kV NORWEB export line from the site would be installed during the construction period of the windcluster.

**15.3.8 Turbine Erection** The turbines would be delivered to the site on approximately 3 - 4 trailers per turbine. The method of construction would involve the use of a small crane for the ground assembly operation which is likely to take approximately 1-2 days. A larger 300-400 tonne crane would be required to erect the turbines once ground assembly is complete.



## 15.4 POTENTIAL IMPACTS

**15.4.1** The principal impacts of any construction activity lie in the noise and traffic which are temporarily generated, together with any disruption of services, and inconvenience which may be caused to other users of the site, including those who may wish to gain access across it. These impacts are considered as follows :

**15.4.2 Noise** The construction techniques proposed for use on site would not involve the use of piling or similarly noisy processes, and the impacts due to noise are likely to be minimal. All equipment would be acoustically shielded where appropriate in order to conform to the relevant standards.

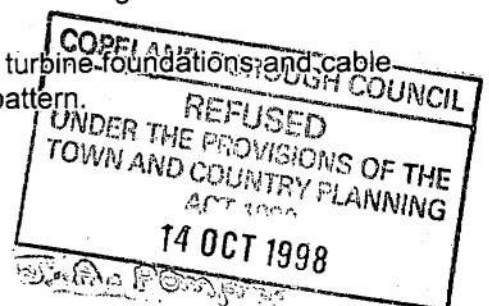
**15.4.3 Site Traffic** The vehicles likely to be involved in construction activities include:

- articulated trailer lorries - to bring initial establishment equipment (portacabins etc.) on to site, later to bring the turbines themselves
- tipper trucks - to bring stone for the access tracks and to remove spoil
- concrete mixers - to bring concrete for the bases
- cranes - one 30 tonne crane for assembling the turbines on the ground and one 300-400 tonne crane for a short period for erection
- miscellaneous vehicles and handling equipment, including cars belonging to the construction workforce.

**15.4.4** The most significant impacts are likely to occur during the construction of the turbine bases, when around 30-45 vehicles movements (in and out) per week are predicted for a period of 8 weeks duration. Given a 5 day working week, this would result in an average of 9 large vehicle movements per day.

**15.4.5** All construction traffic would be routed to the north to and from the A595, as with the existing opencast coal operation. None would pass through Lowca village.

**15.4.6 Disruption of field drainage** Excavation of the turbine foundations and cable trenches may have a short term impact on the field drainage pattern.



**15.4.7 Storage and Disposal of Materials** No fuel will be stored on site. All residual materials (cable offcuts, housings, containers etc) will be removed from the site at the end of the construction period.

**15.4.8 Inconvenience to site users** The principal user of the site is the tenant of Park House Farm, who uses the site for grazing. Although livestock would need to be temporarily excluded from the working area of the site for the duration of the construction period, this is unlikely to cause significant inconvenience to the tenant.

**15.4.9** The works should not impinge on users of the footpath No 413007, which will be crossed by the access track, as usage of the footpath can be readily and safely maintained throughout the construction period.

## 15.5 MITIGATION MEASURES

**15.5.1 Noise** It considered unlikely that specific measures, other than use of standard acoustic shielding on compressors etc., would be required in order to mitigate the effects of construction noise.

**15.5.2 Site Traffic** The impacts of construction traffic would be mitigated through the adoption of the following routing and control measures :

- appropriate warning signs to be erected close to the site to the specification of the Highway Authority
- all heavy vehicles to use the approved route northwards from the site to the A595
- all vehicles to be checked for mud on leaving the site and treated if necessary
- concrete and cement carrying vehicles would be washed off-site
- excess sub-soil, concrete, used oils and other chemicals to be disposed of off-site.

**15.5.3 Disruption of Field Drainage** All drains disrupted by construction works would be diverted, or temporarily maintained using appropriate lengths of piping. The drainage system would be reinstated after completion of the construction works and no long term impact is expected.

**15.5.4 Storage and Disposal of Materials** No waste materials of any sort will be left on site.

**15.5.5 Habitat Protection** The measures proposed in **Section 8** particularly the storage and reuse of turves from areas of species rich acidic grassland would be undertaken in accordance with a Method Statement to be agreed with Copeland Borough Council prior to the commencement of development.

**15.5.6 Inconvenience to members of the public** Continuity of use of the existing rights of way adjacent to the site would be maintained throughout the construction period.

## 15.6 RESIDUAL IMPACTS

**15.6.1** Due to the mitigation measures to be adopted by the developer, the construction activities required to develop the Lowca windcluster would not result in any residual effects on the site or its vicinity.

## 15.7 SUMMARY AND CONCLUSIONS

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15.7.1 The construction of the windcluster would be completed within a period of approximately 28 weeks. Prior to construction, a number of works would be undertaken, including excavation of trial pits for geotechnical investigations, excavations for archaeological evaluation works, construction of site access points, and the careful stripping and storage of soils for re-use.

15.7.2 Construction of site access roads, turbine bases and of the switchgear house; the installation of electrical cabling; and the assembly and erection of the turbines would lead to a number of impacts, principally due to construction noise, site traffic, and disruption of field drains.

15.7.3 Noise impacts would be reduced as far as possible through the use of standard acoustic shielding on compressors etc., and further measures are unlikely to be required.

15.7.4 The impacts of construction traffic would be mitigated through the adoption of specific routing and control measures.

15.7.5 All drains disrupted by construction works would be diverted, or temporarily maintained prior to reinstatement after completion of the construction works. Mitigation of impact on acidic grassland would be achieved by appropriate working methods.

15.7.6 The construction activities which would be required to develop the Lowca windcluster would not result in any residual effects on site or in the vicinity, other than those already considered in the preceding sections of this Environmental Statement.

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## 16. DE-COMMISSIONING

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### 16.1 INTRODUCTION

16.1.1 This section considers the works which would be involved in the de-commissioning of the Lowca windcluster at the end of its operational life, (which is anticipated at some 20 years duration) in order to restore the site to its present use as grazing land.

16.1.2 The **turbines** would be dismantled and removed from site for scrap. The bases would be cut back to below ploughing level, topsoil reinstated and the land revegetated through natural colonisation.

16.1.3 The **access tracks**, if not required for farming purposes, would be removed. As they are to be constructed on a geotextile layer, this operation would be straightforward. Topsoil would then be replaced and reinstated, and the land returned to grassland. Access gates, if not required for farming purposes, would be removed.

16.1.4 The **underground cables** are below ploughing depth and contain no harmful substances. They can be recovered if economically attractive or left in the ground. Terminal connections would be cut back to below ploughing levels.

16.1.5 The **switchgear house** would be dismantled, all equipment removed, topsoil re-spread and the land returned to pasture.

16.1.6 All such decommissioning work would be the responsibility of the developer. Experience in Denmark and The Netherlands shows that scrap and other value of the turbines and electrical components would more than meet the cost of decommissioning.

### 16.2 SUMMARY AND CONCLUSIONS

16.2.1 The Lowca windcluster would be expected to have an operational life of approximately 20 years. After this time, the development would be de-commissioned in order to return the site to its former use as grazing land.

16.2.2 All such decommissioning work would be the responsibility of the developer. Experience in Denmark and The Netherlands shows that scrap and other value of the turbines and electrical components, including transformers, would more than meet the cost of decommissioning.

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## ENVIRONMENTAL STATEMENT

JUNE 1998

### VOLUME 1: NON-TECHNICAL SUMMARY



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*S.A. Pomfret*

# PREFACE

This Environmental Statement has been prepared in support of a planning application submitted by PowerGen Renewables Ltd to Copeland Borough Council in June 1998 for a proposed windcluster on land at Park House Farm, Lowca, for the purpose of generating electricity from wind energy.

The Environmental Statement has been prepared in 3 volumes

- Volume 1 Non-Technical Summary
- Volume 2 Main Text and Appendices
- Volume 3 Figures

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## Inspection of the Planning Application and Supporting Documents

The application and the Environmental Statement are available for inspection at the offices of Copeland Borough Council.

Copies of the Non-Technical Summary, which explains the proposals and their environmental effects, are available free of charge from Copeland Borough Council or from the address below, subject to availability.

Copies of the complete Environmental Statement may be purchased at a cost of £75 + VAT from:

**Wind Prospect Ltd**  
**Chestnuts**  
**Mayshill**  
**Frampton Cotterell**  
**Bristol**  
**BS36 2NS**

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## 1. INTRODUCTION

1.1 Powergen Renewables propose to erect 7 wind turbines and ancillary structures on land on Park House Farm, Lowca, Cumbria. The installed capacity (maximum output) of the site will be approximately 4.6 megawatts, and will on average supply the domestic electricity requirements of 3,800 homes.

1.2 The proposed windcluster has been awarded a contract in the third 'tranche' or round, of projects allocated under the Non-Fossil Fuel Obligation (NFFO).

1.3 An Environmental Statement, of which this is a summary, has been prepared to accompany the submission of a planning application to Copeland Borough Council.

## 2. THE PROPOSED WINDCLUSTER

2.1 The proposed development consists of a windcluster or small wind farm of 7 wind turbines, together with an underground cable network, access tracks, a wind monitoring mast, a small switchgear building providing a connection to a power export cable and appropriate site signs.

2.2 It would be located within fields of coastal grassland, as shown on **Figure 1**, which lie between the low cliffs at Lowca and the former opencast mining site at Park House Farm, which is currently undergoing restoration works. A detailed site plan is at **Figure 6**.

2.3 The **turbines** proposed for the development are the Vestas V 47 or similar. Each turbine is 40 metres to hub height, with blades 23-24 metres long.

2.4 **Access** to the site would be gained from the existing Park House Farm access road which joins the C4001 road approximately 1.5km to the north of Lowca village. The C4001 provides a link directly into the A595(T) main coastal road via the A597, avoiding the village itself.

2.5 Informal **tracks** approximately 4 metres wide would be surfaced with approximately 250 mm depth of stone, to be derived from local sources.

2.6 The electricity produced would be transformed up to 11,000 volts by a small transformer to be located within the base of each turbine. Underground **cables** would be installed at a depth of approximately 1 m below the ground surface to conduct the electricity from the turbines to a small switchgear house, where it would be connected into the NORWEB distribution system.

2.7 A 40 metre **wind monitoring mast** would be installed to provide necessary information for the control and monitoring of the site.

2.8 Once the site is in operation, it would normally be monitored remotely, and would therefore be unmanned. Maintenance staff would make routine visits by car approximately once a month, with intermediate visits as and when problems arise. Major planned maintenance would be carried out approximately twice a year. This would involve one maintenance van on site for approximately a week.

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### 3. THE PLANNING POLICY CONTEXT

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#### National Policy

3.1 The Government's energy policy is to stimulate the development of renewable energy technologies where they have the prospect of being economically attractive and environmentally acceptable. Wind energy is such a renewable technology, and it follows that it is Government policy to stimulate wind energy development.

3.2 The various elements of Government planning policy emphasise the contribution of the planning system to achieving Sustainable Development, and those specific to renewable energy generation reflect the emphasis of Government's energy policy.

3.3 In the context of renewable energy development, a balance must be struck between the benefits of generating energy from clean resources (as set out in the Government's energy policy) and the more immediate and direct impacts on the environment which such development may have

#### Local Policy

3.4 Local policy for the landscape and for renewable energy development requires developments which will have significant adverse impacts to be balanced against the benefits of electricity operation from a renewable resource, in accordance with Government policy.

3.5 The adopted Copeland Local Plan, however, contains a presumption in favour of wind energy proposals of 10 turbines or less, subject to the satisfaction of criteria, regarding such schemes as 'small scale'. The Local Plan acknowledges that in Copeland the best and most appropriate wind energy sites are likely to be coastal, and that whilst renewable energy proposals can often create their own environmental problems, it is areas designated as County Landscapes and Heritage Coast which are particularly unsuited to wind energy development, irrespective of scale.

3.6 The proposed Lowca windcluster is not located within an area statutorily designated for its landscape, wildlife or historic qualities. The site is coastal, and the scheme will be small scale - comprising less than 10 turbines.

### 4. THE NEED FOR THE DEVELOPMENT

4.1 At present, much of the energy we use is generated through the burning of fossil fuels, and through nuclear fission, both of which have serious impacts on the environment. In simple terms, these impacts result in:

- Global Warming
- Pollution
- Irreversible damage to the countryside

4.2 The United Nations " Earth Summit ", held in Rio de Janeiro in 1992, established the need to control greenhouse gases and other emissions, in the light of rising levels of global warming and pollution referred to above. The Summit provided the driving force behind various European and UK initiatives:

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- **European Union:** Initiatives to limit emissions, and to increase the contribution made to energy supplies from renewable sources from 4% to 8% by the year 2005.
- **UK Government:** Initiatives to encourage the development of 1500 megawatts of renewable based electricity generation, (Declared Net Capacity) to be operational by the year 2000.

4.3 The present Government has not only carried these policies forward but has additionally strengthened both targets and commitments. It is currently considering how the potential for renewables to supply 10% of UK demand can be translated into a clear policy objective.

4.4 Most recently and following the Kyoto Conference, on 17 June 1998 the Government agreed to a target of emission reduction of 12.5% by 2010 as the UK's contribution to the overall EU target.

#### Non-Fossil Fuel Obligation Orders

4.5 Following two previous rounds of NFFO contracts in 1990 and 1991, the Government announced the third Non-Fossil Fuel Obligation order on 20 December 1994. Some 55 wind energy schemes with a contracted capacity of 165 MW were awarded contracts under the order, including the proposed Lowca windcluster. Since then one further round of NFFO4 contracts have been awarded; the NFFO5 process is currently in hand.

#### Electricity Production

4.6 The seven turbines will generate on average enough electricity to meet the needs of 3,800 homes. equivalent to nearly 40% of the homes in Whitehaven.

### 5. PLANNING THE DEVELOPMENT

5.1 A range of factors were considered during the development of this proposal, including:

- capacity within and ease of connection to the REC distribution network
- suitable wind resource
- access and general ground conditions
- proximity to residential properties and the character of surrounding land uses
- designated areas of national and local importance and all aspects of landscape, nature conservation, archaeology and heritage

5.2 The site was then analysed in relation to the operational, environmental and safety requirements of each element of a windcluster development, leading to a series of alternative layouts and a preferred design.

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### 6. LAND USE

6.1 The site is located on land at Park House Farm, Lowca which is currently in use primarily for sheep grazing

*John Pomphrey*

6.2 Less than 0.75 hectares of grazing land would initially be lost to agricultural use for the duration of the economic life of the windcluster, an area which would reduce to less than 0.05 hectares when grass cover is successfully re-established over the site access tracks.

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## 7. LANDSCAPE

7.1 The local landscape is characterised by a distinctive linear lowland and ridge which runs roughly parallel to the coast. The area has a long industrial tradition which has resulted in a legacy of engineered features within the landscape.

7.2 As with all wind energy developments, the Lowca windcluster would have impacts on the landscape and visual character of the local area, and measures have been taken in the planning of the windcluster which would reduce or mitigate any adverse effects. These include:

- siting and layout of the turbines, switchgear house and internal access tracks would, as far as possible, be sympathetic with the grain and pattern of the landscape. In siting the turbines to the west of the Lowca ridge, they would be screened in many views from Lowca and the local area by intervening landform;
- use of non-reflective surface finishes in light grey colour
- re-establishment, through natural colonisation, of pasture grasses on access tracks
- adoption of separation zones between turbines and nearby residential properties to minimise the potential for shadow flicker and nuisance due to noise.
- installation of underground electrical connections within the site to minimise visual "clutter" on the site.

7.3 A number of photomontages have been prepared from viewpoints which were selected in response to guidance by Copeland Borough Council. These illustrate how the windcluster is predicted to appear from a number of local viewpoints. In addition, computer-generated analyses (ZVIs) illustrate the areas of West Cumbria, within 20 km of the site, which could potentially have views of a turbine blade or tower, and indicate the likely impact of the turbines in the view. More detailed analyses of potential visibility within Lowca are also presented. The analyses show that:

- There would be no significant impacts in views from most properties in Whitehaven and Lowca; and no properties in Distington, Cleator Moor and Egremont would be affected. Views from many properties in Workington would also be unaffected.
- The windcluster is only likely to result in potential visual impacts of substantial significance in some views from a very limited number of local properties, including Micklam House, Lowca School, Micklam Cottages, and 2 pairs of semi-detached houses on Ghyll Grove, Lowca, together with a number of scattered individual properties including Foxpit Cottage, Park House Farm, and Micklam Farm.

7.4 There are 2 existing or permitted wind turbine sites, Workington Oldside/Siddick and Winscales (not presently constructed), within the neighbouring district of Allerdale, West Cumbria. The proposed Lowca windcluster would be seen, from some viewpoints, in combination with the Oldside/Siddick and Winscales sites, but the combined effect would be broadly acceptable within the terms of Cumbria County Council's informal guidance.

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*A. Pomeroy*

**8. NATURE CONSERVATION**

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8.1 The site consists of five main habitat types:

8.2 **Flushed acid grassland** This is the main semi-natural vegetation community present on the site and covers all the southern most field, supporting breeding skylarks.

8.3 **Gorse scrub** Stands of dense common gorse.

8.4 **Broadleaved woodland** Cat Gill has a low, wind pruned canopy of hazel, gorse, hawthorn and oak over bracken and brambles.

8.5 **Semi-improved marshy grassland** South of Cat Gill there is an area of heavily grazed, species-poor marshy grassland.

8.6 **Improved pasture** The remaining areas of the site are improved pasture.

8.7 Both construction and operation phases of this project will result in land take of flushed acid grassland and semi-improved marshy grassland. The total area of flushed acid grassland is approximately 13ha so the total permanent loss of this habitat in this field will be in the region of 2%.

8.8 Working methods will be agreed with Copeland Borough Council to minimise potential damage to areas of ecological significance.

**9. CULTURAL HERITAGE**

9.1 The physical impact of the proposed development upon recorded archaeological remains within the area of the proposed Lowca windcluster would be principally confined to parts of a 19th century field system and short lengths of associated field boundaries, as well as a short section of a disused mineral railway line. None of these sites are regarded as of either national or regional importance.

9.2 The significance of a possible rectilinear enclosure adjacent to turbine 7 remains unclear. Archaeological trial trenching will be undertaken within this area in order to establish the nature and significance of this site and the impact of the access track to the turbine position.

9.3 The potential impact upon previously unrecorded archaeological remains, particularly of prehistoric or Roman date, is considered to be limited and can be addressed by means of a programme of archaeological monitoring during construction.

9.4 The impact of the proposed development upon the setting of nationally important archaeological remains within the vicinity of the proposed windcluster is not considered to be significant. This includes the site of the Roman fort at Moresby, which also forms a detached part of Hadrian's Wall World Heritage Site.

9.5 In these respects it is considered that the proposed Lowca windcluster would have no significant impacts upon sites of cultural heritage interest and therefore fully accords with the national planning guidance and both strategic and local plan policies relevant to the cultural heritage.

