

Proposed Wind Energy Project and Associated Ancillary Development at Ascog Farm, Bute

Environmental Statement

Prepared for: Argyll and Bute Council

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Preface

An Environmental Impact Assessment (EIA) has been carried out in order to assess the likely impacts that will arise from a three turbine development on the Hill of Ascog, Isle of Bute.

This Environmental Statement reports the findings of this assessment for the purposes of the Planning EIA Regulations (the Environmental Impact Assessment (Scotland) Regulations 2011).

A wind energy project is (in the terminology of the 1999 (amended in 2011) regulations) a Schedule 2 development which would “require an EIA if it is likely to have significant environmental effect because of factors such as its nature, size or location”.

Argyll and Bute Council has determined in their Screening Opinion that the proposed wind energy project of three wind turbines requires an EIA due to the sensitivity of the location.

Contents

1	INTRODUCTION	1
1.1	Proposal at Ascog Farm	1
1.2	Environmental Statement Contributors.....	2
1.3	The Applicants.....	2
1.4	Project Need.....	3
1.5	Project Alternatives.....	3
1.6	Project Feasibility	4
1.7	Structure of this Environmental Statement.....	4
2	ENVIRONMENTAL IMPACT ASSESSMENT.....	6
2.1	Introduction.....	6
2.2	The EIA Process.....	6
2.3	Purpose and Publicity for the Environmental Statement	7
2.4	Approach to the EIA	7
2.5	Assessment of Impacts	9
2.6	EIA Scoping and Consultation.....	13
2.7	Sources of Information	15
3	THE PROPOSED DEVELOPMENT	17
3.1	Proposed Site Layout and Context.....	17
3.2	Project Description	17
3.3	Construction and Operation.....	18
3.4	Construction Management	23
3.5	Decommissioning	24
4	POLICY CONTEXT	26
4.1	National Planning Policy.....	26
4.2	Local Policy	29
5	ECOLOGY	33
5.1	Introduction.....	33
5.2	Approach	33

5.3	Baseline Conditions	41
5.4	Habitat Assessment	44
5.5	Otters (<i>Lutra lutra</i>)	47
5.6	Badgers (<i>Meles meles</i>)	50
5.7	Water Vole (<i>Arvicola amphibius</i>)	52
5.8	Bats (<i>Chiroptera</i>)	54
5.9	Red Squirrels (<i>Sciurus vulgaris</i>)	60
5.10	Pine Marten (<i>Martes martes</i>)	62
5.11	Evaluation of Habitats and Species	63
5.12	Predicted Impacts	66
5.13	Mitigation Measures	77
5.14	Significance of Residual Effects	79
5.15	Summary of Findings and Significant Effects	82
6	ORNITHOLOGY	83
6.1	Introduction	83
6.2	Approach	83
6.3	Baseline Conditions	89
6.4	Predicted Impacts	93
6.5	Mitigation Measures	95
6.6	Significant Residual Effects	95
6.7	Summary of Findings and Significant Effects	96
7	LANDSCAPE AND VISUAL ASSESSMENT	97
7.1	Introduction	97
7.2	Approach	98
7.3	Baseline Conditions	118
7.4	ZTV and Viewpoint Analysis	129
7.5	Mitigation Measures	133
7.6	Predicted Impacts: Landscape Effects	135
7.7	Predicted Impacts: Visual Impacts	150

7.8	Summary of Residual Landscape and Visual Effects	191
7.9	Summary of Significant Effects and Conclusions	202
8	CULTURAL HERITAGE	205
8.1	Introduction	205
8.2	Approach	205
8.3	Baseline Conditions	217
8.4	Predicted Impacts	230
8.5	Mitigation Measures	238
8.6	Significant Residual Effects	238
8.7	Summary of Findings and Significant Effects	238
9	LAND USE AND AGRICULTURE	240
9.1	Introduction	240
9.2	Approach	240
9.3	Baseline Conditions	241
9.4	Predicted Impacts	243
9.5	Mitigation Measures	245
9.6	Significant Residual Effects	246
9.7	Summary of Findings and Significant Effects	246
10	GEOLOGY, SOILS AND HYDROLOGY	247
10.1	Introduction	247
10.2	Approach	247
10.3	Baseline Conditions	249
10.4	Predicted Impacts	251
10.5	Mitigation Measures	254
10.6	Significant Residual Effects	256
10.7	Summary of Findings and Significant Effects	256
11	NOISE ASSESSMENT	258
11.1	Introduction	258
11.2	Approach	258

11.3	Baseline Conditions	261
11.4	Predicted Impacts	265
11.5	Mitigation Measures	271
11.6	Summary of Findings and Significant Effects	271
12	ACCESS AND TRANSPORT	272
12.1	Introduction and Scope	272
12.2	Site Access	272
12.3	Site Transport	273
12.4	Predicted Impacts	275
12.5	Mitigation Measures	277
12.6	Summary of Findings	277
13	SOCIOECONOMIC AND COMMUNITY ISSUES	278
13.1	Introduction	278
13.2	Approach	278
13.3	Baseline Conditions	278
13.4	Predicted Impacts	281
13.5	Mitigation Measures	285
13.6	Significant Residual Effects	286
13.7	Summary of Findings and Significant Effects	286
14	OTHER TECHNICAL ISSUES	287
14.1	Introduction and Scope	287
14.2	Aviation and Radar	287
14.3	Telecommunications	289
14.4	Ice Throw	290
14.5	Shadow Flicker	291
14.6	Road Safety	293
14.7	Summary of Findings and Significant Effects	294
15	REFERENCES	296

List of Tables in ES

Table 2.1	Information Presented in the Environmental Statement
Table 3.1	Indicative Construction Programme
Table 5.1	Guideline Definitions for the Sensitivity of Ecological Receptors
Table 5.2	Definition of Terms Relating to the Character of Ecological Effects
Table 5.3	Matrix Used to Assess the Significance of Potential Effects upon Ecological Receptors
Table 5.4	Phase 1 Habitat Types within the Site
Table 5.5	Bat Survey Times and Weather Conditions
Table 5.6	Summary of Bat Activity levels (Total No. of Passes) Recorded on Transect Surveys
Table 5.7	Potential Impacts on Ecological Interest of the Ascog Farm Wind Energy Turbine Project Proposal
Table 5.8	Potential Impacts of the Wind Energy Project upon Habitats
Table 5.9	Bats as Individuals likely to be at risk from Wind Turbines (Natural England, 2009)
Table 5.10	Populations likely to be threatened due to the Impacts from Wind Turbines (Natural England, 2009)
Table 5.11	Potential Impacts of the Wind Energy Project upon notable Fauna Species
Table 5.12	Ecological Receptor Residual Effects of Development
Table 6.1	Schedule of Winter Vantage Point Survey Visits
Table 6.2	Schedule of Winter Vantage Point Survey Visits
Table 6.3	Examples of Different Sensitivity Levels for Birds
Table 6.4	Examples of Different Magnitude Levels of Impacts
Table 6.5	Sensitivity of Species Significance Matrix
Table 6.6	Total Count of Greylag Geese in the Loch Ascog Area on each Winter Vantage Point Survey Date
Table 6.7	Non-breeding Target Species Recorded during Winter and Summer Vantage Point Surveys
Table 6.8	UK BAP Priority Species Breeding within 500 m of the Proposed Development
Table 7.1	Scope of the Landscape and Visual Assessment
Table 7.2	Viewpoint Selection Process
Table 7.3	Wind Energy Development Included in the CLVIA within 35 km
Table 7.4	Cumulative Wind Energy Developments between 0 and 70 km
Table 7.5	Landscape Policies
Table 7.6	Evaluation of Landscape and Visual Effects
Table 7.7	Landscape Effects during Construction
Table 7.8	Indirect Effects on Local Landscape and Seascape Character (within 10 km)
Table 7.9	Indirect Effects on Nationally Designed Landscape Character (between 10 km and 35 km)
Table 7.10	Indirect Effects on Designated Landscapes within the Surrounding Area
Table 7.11	Visual Effects on Views from Settlements
Table 7.12	Visual Effects on Views from Residential Properties
Table 7.13	Visual Effects on Views from Transport Routes
Table 7.14	Visual Effects on Views from Ferry Routes

Table 7.15	Visual Effects on Views from Recreational Routes
Table 7.16	Visual Effects on Views from Recreational and Tourist Destinations
Table 7.17	Summary and Evaluation of the Predicted Landscape Effects
Table 7.18	Summary and Evaluation of the Predicted Visual Effects
Table 8.1	Legislation and Policy Issues considered in Preparing the Cultural Heritage Assessment
Table 8.2	Summary of Importance of Assets
Table 8.3	Definition of Magnitude
Table 8.4	Establishing the Level of Effect
Table 8.5	Rationale for Selection of Assets for Assessment
Table 8.6	Key Attributes of Settings of Designated Assets
Table 9.1	Magnitude of Impact
Table 9.2	Properties within 500 m of Wind Energy Project
Table 10.1	Magnitude of Impact
Table 11.1	Typical Noise Levels
Table 11.2	DAR E-48 Octave band Sound Power Data dB(A)
Table 11.3	Turbine Hub to Receptor Distances (m)
Table 11.4	Example of Individual Turbine Levels at Ascog Farm House showing Combined Calculated Level (dB(A)) for Quiet Day Time and Night Time Periods
Table 11.5	Combined Predicted Noise Levels at closest Receiver Properties (dB(A)) Quiet Day and Night Time
Table 11.6	Trend Line Equations for LA90 Data
Table 11.7	Quiet Day Turbine Noise Results (dB(A))
Table 11.8	Night Time Turbine Noise Results (dB(A))
Table 11.9	ETSU R97 Derived limit values Quiet Day and Night periods
Table 12.1	Transport To and From the Site
Table 13.1	Population Figures (2001 Census)
Table 13.2	Employment Data (2001 Census)
Table 14.1	Distance from Proposed Wind Energy Project (distances quoted are to the closest proposed wind turbine)
Table 14.2	Shadow Flicker Assessment for Properties within 480 m of the Proposed Turbines

List of Figures in ES

Figure 1.1	Site Context Map
Figure 5.1	Ecology Study Area, Ascog Wind Energy Project
Figure 5.2	International Site Designations within 20 km Radius of Ascog Wind Energy Project Proposal
Figure 5.3	National Site Designations within 5 km Radius of Ascog Wind Energy Project
Figure 11.2	Wind Speed Records at 10 m Height
Figure 11.3	Background Noise (dB(A)), Quiet Daytime
Figure 11.4	Background Noise (dB(A)), Night
Figure 11.5	Calculated Noise Levels at all Properties Quiet Daytime
Figure 11.6	Calculated Noise Levels at Ascog Farm, Night

List of Appendices

Appendix A	Site Plans
Appendix B	Summary of Pre-Planning Consultation and Scoping Responses
Appendix C	The Proposed Development
Appendix D	Ecology Appendix
Appendix E	Ornithology Appendix
Appendix F	LVIA Appendix
Appendix G	Cultural Heritage Appendix
Appendix H	Noise Appendix

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1 INTRODUCTION

1.1 Proposal at Ascog Farm

SAC has been instructed by the applicants, Mr A Tear and Ms E McVey, to undertake an Environmental Impact Assessment (EIA) to accompany a planning application for a proposed wind energy project at Ascog Farm, Isle of Bute. The proposed development site is located on land within the applicants' ownership at Ascog Farm on the Isle of Bute, Argyll and Bute.

The site lies approximately 2 km south of the town of Rothesay at grid reference NS102635, as shown in Figure 1.1.

Figure 1.1: Site Context Map (Contains Ordnance Survey Data © Crown Copyright & Database Right 2012)



A full description of the site and the proposed development is provided in Sections 3.1 and 3.2 respectively of this Environmental Statement (ES) while site drawings can be found in Appendix A.

1.2 Environmental Statement Contributors

This Environmental Statement has been largely compiled by SAC Environment & Design with a number of contributing authors as listed below:

- The Ecological Assessment Chapter was undertaken by Horizon Ecology Ltd using fieldwork data carried out by Horizon Ecology Ltd;
- The Ornithology Chapter was compiled by SAC using fieldwork data carried out by Horizon Ecology Ltd and SAC;
- Landscape and Visual Assessment Chapter was compiled by AMEC Environment & Infrastructure UK Limited;
- Cultural Heritage Assessment was undertaken by AMEC Environment & Infrastructure UK Limited; and
- The Planning Statement was compiled by HG Planning Ltd.

1.3 The Applicants

The applicants, Mr A Tear and Ms E McVey, purchased Ascog Farm in 2008 on the Isle of Bute where Ms McVey's family have been farming since the early part of last century.

With long established connections to the island the applicants are also aware of the need to stimulate the local economy and support the local community. The launch of the Community and Renewables Energy Scheme (CARES) in April 2011 by the Scottish Government was an ideal opportunity to achieve these objectives. An application was made to Community Energy Scotland (CES) who administer the Community and Renewables Energy Scheme. This scheme was launched with the aim of generating 500 MW of community and locally owned renewable energy in Scotland by 2020. The Scottish Government recognises the great potential of renewable energy in Scotland and set up CARES to help communities, farmers and landowners to engage in the expensive pre-planning assessment costs that would otherwise be a financial challenge. Following thorough assessment by CES and the Energy Saving Trust the Ascog Wind Energy Project was awarded this loan. The conditions of CARES stipulate that a) the loan is repaid should the planning application be successful and b) that the local community should benefit directly from the scheme, with payments made to a local organisation for disbursement. In the case of the Ascog Wind Energy Project, the fund would be administered by the applicant's chosen local partner Towards Zero Carbon Bute (TZCB) which is a project of Fyne Futures, a registered Scottish Charity, for the benefit of all those on Bute. Further details can be found in the Planning Statement.

1.4 Project Need

This project has evolved largely in response to the renewable energy targets set by Scottish Government as well as the greenhouse gas emission reduction commitment. As world fossil fuel prices increase with growing energy demands and depleting supplies, energy security has become an issue for many nations including the UK. The use of fossil fuels to supply energy produces greenhouse gas emissions which are believed to be responsible for climate change. Alternative sources of energy are needed to fill this widening supply-demand gap and reduce emissions. Wind energy is one of a suite of renewable technologies being pursued and encouraged by local and national governments.

The Climate Change (Scotland) Act 2009 saw the Scottish Government set an interim target to reduce emissions by 42% by 2020. Furthermore, in 2011 the Scottish Government increased the renewable energy generation target to 100% of Scotland's electricity from renewable sources by 2020¹. Likewise, the UK national government has committed to increasing renewable electricity sources to 15% of UK electricity requirements by 2020. Renewable sources of energy are an essential ingredient in the Scottish and UK Climate Change Programme and to meet these commitments there will need to be a sustained and substantial acceleration in the development of renewable energy.

1.5 Project Alternatives

Currently there are limited opportunities for other forms of renewable energy on site. Solar energy is not cost effective at this scale and there no significant hydro opportunities on site. Using today's technology, the only proven, viable renewable energy source that would provide significant electricity generation in a cost effective way is onshore wind.

The proposed site for the wind energy project has been designed through a process of feasibility and environmental assessment to represent the best balance between technical feasibility, resource potential and environmental impact. The turbine locations have been established to achieve maximum separation from residential properties and receptors, and to avoid interference with telecommunications links, whilst still retaining a sufficiently elevated position to attract a favourable wind resource.

¹ 2020 Routemap for Renewable Energy in Scotland, Scottish Government

A fourth turbine was considered during the feasibility stage of the project; this turbine was located due west of Balmory House. This would have appeared in close proximity if not direct juxtaposition with Balmory House close views. Historic Scotland had concerns about the potential adverse impact of this turbine on Balmory House, therefore this turbine was removed from the layout. Removing this turbine has resulted in a substantially reduced direct effect on known and potential previously unrecorded archaeological features and has minimised the indirect effect on the setting of Balmory House.

1.6 Project Feasibility

The initial feasibility and site selection process confirmed that the site would be commercially viable for wind development on a long-term mean average wind speed of around 7.7 m/s at a height of 45 m as per the Department of Energy and Climate Change (DECC) wind speed database. A Met Office study was commissioned to provide a wind speed estimate based on a longer wind data set (over 30 years) using more modern modelling programmes. This report estimated the average wind speed at 10 m to be 7 m/s and when extrapolated to hub height (50 m) the wind resource was found to be 9.4 m/s. In 2011 planning consent was obtained by the applicant to erect a wind monitoring mast; a 50 m anemometer was installed on site in January 2012 and it is anticipated that data on wind speed and direction over a period of 12 months would confirm more precisely the on-site wind resource.

The development is anticipated to have a maximum installed capacity of 2.7 MW and yield assessments based on the modelled wind resource indicate that up to 8.28 GWh per year of electricity may be generated. This equates to the consumption of approximately 2,133 homes² and in turn offsets around 3,612 tonnes of CO₂³ equivalent emissions each year.

1.7 Structure of this Environmental Statement

Following this introductory Chapter, the ES takes the following form:

- Chapter 2 sets out the approach which has been taken in assessing the potential environmental impacts of the proposals;
- Chapter 3 presents information about the proposed development, its location and how it would be constructed;

² 3,880 kWh/house/year. Strathclyde University Figures

³ 1,693 kg CO₂/year. Strathclyde University Figures

-
- Chapter 4 provides a summary of the planning policy relating to this development;
 - Chapters 5 to 14 present the assessment of the potential environmental impacts of the wind energy project development during construction, operation and decommissioning and as a result of the permanent changes in land use. These include:
 - Ecology (Chapter 5);
 - Ornithology (Chapter 6);
 - Landscape and Visual effects (Chapter 7);
 - Cultural Heritage (Chapter 8);
 - Land Use and Agriculture (Chapter 9);
 - Geology, Soils and Hydrology (Chapter 10);
 - Noise (Chapter 11);
 - Access and Transport (Chapter 12);
 - Socioeconomics and Community Issues (Chapter 13); and
 - Other Technical Issues (Chapter 14).

References used in the assessment are presented in Chapter 15. The appendices hold all the relevant figures and additional technical information to support the text presented in this ES. A Non-technical Summary of the ES and a Planning Statement have also been prepared as two separate documents.

2 ENVIRONMENTAL IMPACT ASSESSMENT

2.1 Introduction

This Chapter sets out the approach which has been followed for the EIA and the reporting of predicted effects in this ES and takes the following form:

- Sections 2.2 and 2.3 describes the EIA process and purpose and publicity of the ES;
- Sections 2.4 and 2.5 deal with the overall approach and method of assessing impacts;
- Section 2.6 reports the findings of the scoping process and consultations for the EIA; and
- Section 2.7 sets out the key sources of information used in the EIA.

2.2 The EIA Process

Environmental impact assessment is a process which is required to determine the potential for significant environmental effects from certain types of development as a result of their scale, location or characteristics. The findings of the EIA are reported in an Environmental Statement (ES) which is used by decision makers in determining development applications and in helping to avoid, reduce or offset the potentially significant effects. In Scotland the principal legislation setting out the requirements for EIA is The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011⁴ which amends the former Environmental Impact Assessment (Scotland) Regulations 1999 in relation to developments requiring planning consent such as the proposed wind energy project at Ascog Farm.

The EIA Regulations provide for applicants to seek a formal view known as an opinion on the requirement for EIA of a development (screening opinion) and the scope of any required assessment (scoping opinion) from the planning authority. A screening opinion was provided by Argyll and Bute Council on 6 September 2010 for the proposed wind energy project at Ascog Farm. This established that an EIA would be required and would be viewed as being material to the determination of the subsequent planning application.

⁴ Hereafter referred to as the EIA Regulations.

A scoping report was then prepared by SAC Consulting and a scoping opinion subsequently requested from the planning authority. The scoping opinion was received from Argyll and Bute Council on 21 January 2011. The implications of the scoping opinion and the consultations which were undertaken in support of this are presented in more detail in Section 4.3 of this ES and have been used in the EIA process to support the assessment.

2.3 Purpose and Publicity for the Environmental Statement

This ES sets out the findings of the EIA undertaken for the proposal for three wind turbines at Ascog Farm, Isle of Bute. A separate Non-technical Summary (NTS) of the ES has been prepared as well as a planning statement. These documents will be provided to all of the statutory consultees involved in the EIA process, as required by the Regulations.

The ES and the NTS can also be inspected by members of the public at the principal offices of the Argyll and Bute Council at Kilmory, Lochgilphead, Argyll, PA31 8RT and further copies of the ES and NTS can be obtained from the following address:

- SAC Environment & Design, Pentland Building, Bush Estate, Penicuik, Midlothian, EH26 0PH

Copies of the ES are available from this address in CD format at a cost of £10. Copies of the Non-Technical Summary can be provided without charge.

2.4 Approach to the EIA

EIA is a process to identify, predict, evaluate and report the environmental effects of a development project and to inform the decision making authority of these effects prior to determining any development consent. The assessment process is also intended to improve the environmental design of the project through identifying the need for, and incorporating suitable mitigation measures into the project. The EIA has been approached to ensure compliance with the European Directive on EIA and the Scottish EIA Regulations, as well as with relevant guidance on EIA including the Scottish Government Circular 3/2011 and Planning Advice Note 58. Good practice guidelines for EIA have also been followed. Technical guidance has been referred to in the appropriate Sections of this ES.

The principal stages followed in the EIA have involved:

- Baseline surveys to provide a description of the environmental characteristics of the area likely to be affected by the development;

- Identification of information on proposed developments in the immediate development area and in particular for other consented or under-construction wind turbines/wind farms within 70 km of the site;
- Consideration of the potential interactions between the proposed development and the existing and likely future site conditions;
- Prediction and characterisation of the environmental impacts of the development, both direct and indirect, in the short and long term;
- Evaluation of the significance of environmental effects including the potential for cumulative effects with other known development proposals in the area; and
- Identification of mitigation measures to avoid, minimise or offset significant adverse effects and enhance positive effects. Alterations to the proposed design were then re-assessed and the residual environmental effects following mitigation evaluated.

The findings of the EIA are set out in this Environmental Statement. Schedule 4 (Part 1⁵) of the EIA Regulations sets out the information required in an Environmental Statement. These requirements are summarised in Table 2.1 below together with an indication of where the information can be accessed in this ES.

Table 2.1: Information Presented in the Environmental Statement

Summary of Schedule 4 Requirements	Where Addressed in this ES
1. Description of the development, including physical characteristics, land use requirements, production processes, materials used, residues and emissions from operation.	The proposed wind turbine development at Ascog Farm is described in Chapter 3 of this ES. Certain characteristics such as noise emissions are addressed in the relevant technical Chapter of the ES.
2. Outline of the alternatives studies and main reasons for choice made taking account of environmental effects.	The options considered in taking forward the project to the planning stage are set out in Section 1.3 of the ES.
3. Description of the environment likely to be significantly affected including population, fauna, flora, soil, water, air, climatic factors, material assets, landscape and the interrelationship between these factors.	The baseline environmental context and sensitivity is outlined at the start of each of the technical environmental assessments reported in this ES (Chapters 5 to 13).
4. Description of the likely significant effects of the development on the environment	The predicted impacts and likely significant environmental effects of the proposals during

⁵ This ES contains all the information required by Part II of Schedule 4 of the Regulations and the information which has been reasonably required to assess the effects of the project.

Summary of Schedule 4 Requirements	Where Addressed in this ES
resulting from (a) the existence of the development (b) the use of natural resources (c) the emission of pollutants, creation of nuisances and elimination of waste, and a description of the forecasting methods used to assess the effects on the environment.	construction and operation (including cumulative effects) are presented in each of the technical assessments reported in Chapters 5 to 13 of this ES. Chapter 14 presents some further predicted technical issues. Methods of assessing impacts are presented generally in Section 2.4 with topic specific information on relevant ES Chapters reporting the environmental effects.
5. Description of the measures to prevent, reduce and offset any significant adverse effects on the environment.	Mitigation measures are set out in the reporting of the environmental effects in each of Chapters 5 to 13.
6. A non-technical summary of the information provided in points 1 to 5 above.	A non-technical summary of the Environmental Statement has been produced and is available separately from this ES document.
7. Indication of any difficulties encountered in compiling the required information.	Assumptions and limitations in approaching the EIA are presented in Section 2.4 of this ES document and where relevant in each technical Chapter.

The reporting of the assessment of environmental effects in this ES has been presented in Chapters 5 to 14 in a consistent format with reference to relevant technical standards, guidelines and legislation. The assessments have also taken into account the findings of consultation undertaken during the EIA and its prior scoping (see Section 2.5). Where additional technical information has been produced, this has been presented in the appendices to this ES.

2.5 Assessment of Impacts

2.5.1 Impact Prediction

Environmental impacts have been characterised through consideration of the construction, operation and decommissioning of the proposed wind turbine development and analysis of the potential for interactions from these activities with the baseline environmental conditions such that a change can be reasonably predicted. Impacts have been generally defined in the subsequent Sections of this ES as either short term impacts or long term impacts. These are defined as follows:

-
- Short term impacts are those predicted to occur as a result of the site establishment and construction works for the project (as well as eventual decommissioning); and
 - Long term impacts are longer term impacts (lifecycle of development is about 25 years) of operating the wind turbines as well as the reversible changes in land use resulting from the development.

Impacts are identified throughout this ES as beneficial or adverse. Wherever possible to provide consistency in the assessment, the magnitude of impacts has been predicted with respect to the following criteria:

- High – a total loss or considerable alteration to elements or features of the resource resulting in a substantial change to the baseline;
- Medium – a partial loss or alteration to elements or features of the resource, which may be reversible, resulting in a moderate change to the baseline;
- Low – a minor loss or alteration to elements or features of the resource, generally reversible, resulting in a small change to the baseline; and
- Negligible – an undetectable or very limited change to the baseline.

The assessment process has taken into account the potential impacts of the development on future baseline environmental conditions. The assessment has been based on an understanding of baseline conditions in 2012 as this is the year the EIA was undertaken and finalised. It has broadly been estimated that the development, if consented, would be constructed in 2014 and operational by 2015 however there is inherent uncertainty in predicting the planning process. Therefore the approach for most of the assessment topics has been to consider the impact of the development on a baseline which is anticipated to occur in the absence of the development in future years.

2.5.2 Evaluation of Environmental Effects

The determination of impact significance arising from the development is a key stage in the EIA and it is crucial to informing the decision-making process. Environmental effects have been evaluated with reference to the predicted impact magnitude and the sensitivity of the receiving environmental resource (baseline) including the presence of sensitive natural, cultural or human receptors. This process is followed to determine the significance of the environmental effects and has been informed for each technical area by reference to appropriate factors including relevant standards/guidance, thresholds, policies, and by

responses from consultees to the EIA process. In each case evaluation of environmental effect significance involves a degree of judgement with reference to these factors.

The significance of environmental effects (beneficial and deleterious) has been categorised and reported wherever possible using the following scale:

- Negligible – no discernible deterioration or improvement to the existing environment;
- Minor – a small improvement (or deterioration) to the existing environment;
- Moderate – a noticeable improvement (or deterioration) to the existing environment; and
- Major – a significant improvement (or deterioration) to the existing environment.

Using this impact significance scale, any impact assessed as minor or negligible would not be considered significant. Any impact of moderate or greater is considered to be significant.

It should be noted, that where assessment was undertaken by an external consultant (or in Chapter 6: Ornithology), the significance of environmental effects has been categorised and reported differently to those stated above. A summary is provided as follows and for further detail see each individual Chapter:

- Chapter 5: Ecology and Chapter 6: Ornithology use the following scale – very low, low, medium, high and very high and effects with significance of medium or higher are considered to be significant in terms of the EIA Regulations;
- Chapter 7: Landscape and Visual Assessment uses the following scale – no change, negligible, slight, moderate and substantial and effects with significance of moderate/substantial and substantial are considered to be significant in terms of the EIA Regulations; and
- Chapter 8: Cultural Heritage uses the following scale – no effect, negligible, slight, moderate, substantial and very substantial. Effects with significance of moderate and substantial are considered to be significant in terms of the EIA Regulations.

2.5.3 Mitigation and Residual Effects

The proposed project has been designed from the early stages of feasibility to ensure that environmental effects have been prevented or reduced wherever possible. Where it has not been possible to completely avoid environmental effects, mitigation measures have been developed to reduce the predicted effects, particularly where significant effects without

mitigation are predicted. Wherever possible, mitigation has been developed to ensure that no significant residual adverse environmental effects are predicted.

The mitigation measures presented in this ES are integral to the delivery and design of the project. Mitigation measures are therefore committed and would be implemented as part of the project's construction and design.

2.5.4 Cumulative Effects

Cumulative effects are particularly important for wind turbine proposals in relation to landscape and visual amenity and impacts on birds. The potential for cumulative effects has been assessed taking account of information available about other existing, consented (but not constructed) or publicly proposed wind turbine and wind farm developments within a 70 km radius of the site at Ascog Farm. This approach is consistent with current guidance on cumulative landscape and visual effects⁶ and has been agreed during the assessment process with SNH. The assessment of cumulative landscape and visual impacts (see Chapter 7) draws on an understanding at the time of preparation of this ES of existing wind farms, those approved, under construction or in planning.

Cumulative impacts have also been considered for other assessment topics where there is potential for interactions on receptors from different environmental impacts (e.g. noise and visual effects on a sensitive residential property). Where cumulative effects are predicted these have been reported within each of the technical Chapters of this ES.

2.5.5 Assessment Uncertainties

The assessment reported in this ES has been based upon project details and the best available knowledge of other developments in the vicinity of the proposed wind energy project at the time of submission. There are uncertainties inherent in the EIA process and these include:

- Uncertainties in construction methods, quantities and materials;
 - Data gaps;
 - Changes in design of the project following submission of the planning application;
- and

⁶ SNH (2005) Cumulative Effect of Windfarms, Version 2.

- Changes in development decisions affecting other developments and hence the cumulative effects assessment.

The effect of these uncertainties on the impact prediction and evaluation process has been minimised by establishing the design and construction details as accurately as possible for the purposes of the planning application and the EIA. Whilst minor details in the project design or its method of construction or operation may occur, it is not anticipated that these will have a material bearing on the information used for this assessment. Any changes in design post planning would be considered with reference to the details set out in the ES and should any significant variations occur these would be considered to determine whether there would be a change in any of the findings of the ES in terms of the predicted significance of residual effects. Should the final project design result in a predicted worsening of the environmental effects predicted in the ES then this would be discussed with the local planning authority as part of the process of expediting planning conditions prior to construction.

2.6 EIA Scoping and Consultation

A scoping report was prepared by SAC and submitted to Argyll and Bute Council in November 2010 with a request for a scoping opinion. The Council's scoping opinion was received in January 2011 and highlighted the following key areas as the focus for the EIA:

- Landscape and visual considerations including impacts on designated sites, key viewpoints and views for visual receptors and cumulative impacts with other wind farm developments;
- Ecological issues including effects on otters, birds (particularly geese) and on-site habitats;
- Pollution prevention and environmental management during construction and decommissioning;
- Effects on the setting of sites of archaeological features, historic gardens, buildings and landscapes;
- Tourism and recreation effects, in particular from visibility of the development;
- Amenity issues for nearby properties including noise and shadow flicker; and
- Technical issues such as aviation, radar and telecommunications.

The scoping opinion included detailed responses from a number of consultees and the issues raised have been addressed within the technical Chapters of this ES. These issues

have formed the areas of key focus for the EIA process; however other areas of potential environmental (and technical) impact are also recorded in this ES for completeness. Generally such issues are not predicted to give rise to significant environmental effects and in these cases the level of reporting of the assessment is more concise.

Consultation has therefore been undertaken with a range of statutory and non-statutory organisations during the development and assessment of the project. The principal consultees who were consulted during preparation of this ES are as follows:

- Argyll and Bute Council;
- Scottish Natural Heritage (SNH);
- Scottish Environment Protection Agency (SEPA);
- Historic Scotland;
- Scottish Water;
- Transport Scotland;
- Inverclyde Council;
- West of Scotland Archaeology Service;
- Ofcom;
- JRC (Joint Radio Company);
- Atkins Global;
- BT (British Telecom);
- BAA (British Airports Authority);
- CAA (Civil Aviation Authority); and
- MOD (Ministry of Defence) Estates.

Following receipt of the scoping opinion, SAC undertook further consultation with SNH to scope the required level of ecological and ornithological surveys and assessment. This was necessary to determine the required temporal scope of winter geese surveys around Loch Ascog and to agree the approach and scope to surveys for breeding birds, protected species and habitats. This process was supported with a more detailed ecological scoping report which was submitted to, and agreed with SNH, in advance of on-site survey work and to confirm that winter geese surveys could be limited to one winter period (2010/11). The approach to assessment of ornithology impacts, and the findings of the assessment are presented in Chapter 6 of this ES.

Similarly, given the importance of landscape and visual issues raised in the consultation process, further discussions were held with SNH to agree the approach to assessment and

in particular to determine the locations of viewpoints to inform the visual impact assessment. This process, which involved the submission of wireframes and zones of theoretical visibility (ZTV) for the development, resulted in the identification of 21 viewpoints. The approach to assessment of landscape and visual impacts, and the findings of the assessment are presented in Chapter 7 of this ES.

A summary of the issues raised in all written correspondence with consultees during the EIA is presented in Appendix B of this ES.

2.7 Sources of Information

The design and layout of the proposals at Ascog Farm have developed iteratively through a process of feasibility appraisal and design development. This work and the subsequent EIA of the proposed development has been informed by reference to a number of information sources. These include:

- Ordnance survey mapping and aerial photography;
- Site visits and surveys carried out during 2011;
- Site plans, drawings and turbine layouts;
- On site wind and noise monitoring data (measured in April and May 2011);
- Access and transport survey undertaken by Greencat Renewables;
- Turbine data from Enercon;
- Data on other wind turbine and wind farm developments obtained from Argyll and Bute Council; and
- The statutory development plan.

The EIA process has been informed by the following:

- EC Directive 85/337/EEC on Environmental Assessment as amended by Directive 97/11;
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011. Scottish Statutory Instrument 2011 No. 139;
- Institute of Environmental Management & Assessment (2004) Guidelines for Environmental Impact Assessment;
- SNH (2009) A Handbook on Environmental Impact Assessment; and
- Scottish Government (2011) Circular 3/11 The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011.

Data specific to the assessment of environmental impacts is presented in each of the relevant topic assessments in Chapters 5 to 14 of this ES.

3 THE PROPOSED DEVELOPMENT

3.1 Proposed Site Layout and Context

The proposed site for the three wind turbines is located on an elevated ridge of land known as the Hill of Ascog whose slope is orientated approximately north west to south east (Drawing No. 1.2 and Drawing 1.3 in Appendix A). The ridge is steepest on its western and north western sides where the land drops down to Loch Ascog and a narrow valley containing a minor burn which outfalls to the coast at Montford. The hill rises to an elevation of approximately 100 m Above Ordnance Datum (AOD) however the location of the proposed turbines would be slightly to the south of the highest point: Turbine 1 – 94 m AOD, Turbine 2 – 90 m AOD and Turbine 3 – 76 m AOD.

The proposed site and the surrounding area is comprised of improved grassland, predominantly grazed by cattle and sheep with abundantly managed hedgerow boundaries and irrigation ditches. There are extensive areas of dense and scattered gorse scrub. The nearest privately owned residential properties to the site are more than 380 m from the closest proposed turbine location.

The impacts of the proposals on land use, including agricultural uses of the proposed development site, are considered further in Chapter 9 of this ES.

As detailed in Section 1.5, four turbines were originally considered during the feasibility stage, however the fourth was removed to mitigate against potential impacts identified during the pre-planning consultation process.

3.2 Project Description

The project proposals comprise the construction of three wind turbines with dimensions of 50 m to hub and 74 m to blade tip. The turbines would be sited broadly in line along a north south axis with the northerly and central turbines near to the top of the hill (Turbine 1 at NGR NS10046354 and Turbine 2 at NGR NS10066337) and the southern turbine further down the hill (Turbine 3 at NGR NS10066319). A small area of permanent hardstanding (20 m by 30 m) would be formed adjacent to the base of each turbine tower to provide a platform for future maintenance and decommissioning equipment.

The proposed turbine locations and site layout are shown in Appendix A. The development would also consist of ancillary development associated with wind turbines. An access track would be constructed in order to allow the turbine delivery to the site and to allow for maintenance of the wind turbines. A site control building (8 m by 5 m) next to Turbine 3 would house the required electrical switchgear. The power from the turbines would be transported via an underground cable to the site control building.

The site would be accessed by vehicle from the minor C-class road which connects Rothesay to Mid Ascog and by means of a new access track to be formed from this road to the site. Transportation impacts of the project are assessed in Chapter 12 as well as further information on site access and construction.

This ES has assumed that the turbines would be operational by 2015. The wind energy project has a design life of 25 years after which it is anticipated that either an application would be submitted for re-fitting of turbines or the site would be decommissioned.

3.2.1 Reference Wind Turbine

It is proposed to install three wind turbines; these may be an Enercon E48, or a similar sized unit. The turbine would have a base diameter of approximately 4 m and would be mounted on a tapered tubular steel tower to which are attached a hub and rotor assembly including three blades. In the base of the turbine tower there would be a transformer that would boost the voltage of the turbine's electricity output from 400 V to 11 kV.

Power from the turbine would be transmitted along an 11 kV underground cable to a site control building to be located at the position marked on the site plan. The final size would be determined by the electricity company and the external finish would be agreed with Argyll and Bute Council.

A typical colour for the towers is a semi-matt grey, designed to blend with a sky background and present a clean appearance. The final turbine colour specification would be determined by consultation with Argyll and Bute Council.

3.3 Construction and Operation

The construction phase would begin after planning consent has been granted by Argyll and Bute Council and would be ongoing for approximately nine months, from site preparation to

commissioning of the wind turbines. The development would be constructed in accordance with industry standard techniques and best practice, and suitably experienced contractors would be appointed to design, construct and commission the Ascog Wind Energy Project.

Specific environmental mitigation measures that are required for the development would be clearly stated at the tendering phase of the construction process and all sub-contractors would be made aware of these as detailed in the Construction Environmental Management Plan (CEMP).

3.3.1 Temporary Works

A secure temporary storage compound would be required during the construction period. The proposed location of the compound would be located adjacent to the hard standing of Turbine 3 as shown on the detailed site plan in Appendix A. The compound would be approximately 20 m by 10 m and would be used for the following purposes:

- Temporary type structures used for office and welfare facilities (including toilet with provision for sealed waste storage and removal). Welfare facilities would be installed as required by the Construction (Health, Safety and Welfare) Regulations 1996. If possible these facilities would utilise services already in existence otherwise a diesel generator would be used to service the site accommodation;
- Storage and assembly of turbine components; and
- Containerised storage for tools and small parts.

Wheel wash facilities would be installed to minimise debris to public highways (if required) and temporary fencing would be created around all excavations for health and safety purposes.

3.3.2 Permanent Works

3.3.2.1 Access Tracks

Construction of access tracks would be required to facilitate access by road-going HGVs during the construction period. The track would be constructed to 4 m wide and comprise a deep foundation layer topped with blinded gravel⁷. Excavations would be made by stripping back the topsoil from the area to be excavated to a depth of 40 mm; soil would be stored as

⁷ The precise design will be confirmed following tests on the soil structure.

a low mound adjacent to the excavation area and used for backfill at the crane hardstanding area and to reinstate track edges as required. Any extracted stone would be crushed to a suitable size and sufficient stone for backfilling would be stored alongside the excavation; any surplus clean broken stone would be used for access track construction.

The access track would be suitably cambered to allow rainwater to be shed where gradients are present. Any field drains found during construction would be re-connected to ensure that the drainage system is maintained. The track would be left in place after completion of the wind turbine construction, as it would provide access for maintenance, repairs and eventual decommissioning of the wind turbines. Further details for access tracks can be found in Chapter 12.

3.3.2.2 Turbine Foundation and Crane Hardstanding

The foundation proposed for each turbine is an inverted saucer in section, consisting of a reinforced circular central concrete pedestal. The maximum diameter of the foundation would be 16 m and the maximum intended depth of the foundations is approximately 1.6 m; the approximate volume of concrete required for each turbine foundation is 145 m³. The foundation would need to sit on a base layer of stone, therefore actual excavations would be to a depth determined at installation to ensure stability of the base.

As soon as is practical following installation of the turbines, the immediate construction area of the foundations would be restored to its original profile. The topsoil would be replaced and reseeded undertaken as appropriate. A plinth of approximately 6 m diameter would be left; the tower would be attached here to the foundation with foundation bolts embedded into the concrete. This progressive reinstatement would assist with re-establishment of the local ecology as it minimises the time soil and plants are in storage.

A hardstanding area, 20 m wide and 30 m long, would be required around each turbine base for related construction and crane erection activities. The hardstanding would be left in place following construction in order to allow for the use of plant should major components need replacing during the operation of the turbines.

3.3.2.3 Stone and Concrete Requirements and Sourcing

Any aggregate and ready-mix concrete required would be sourced locally. For the purpose of this ES, it has been assumed that aggregate for the access roads would be sourced from

extractions as detailed in Section 3.3.2.1; should additional stone be required, this would be imported from local sources. No borrow pits have been proposed at this stage, although, exploratory works would be carried out and the outcome of this may confirm stone can be site won. Any further proposals for borrow pits, would be subject to a further application and assessment would be required.

3.3.3 Grid Connection

3.3.3.1 Electrical Infrastructure

The electrical design has been based around the connection of three wind turbines, each rated up to 900 kW, using interconnected underground cables operating at 11 kV. The cables would be laid in a trench, typically up to 1 m deep and 0.45 m wide. The trench would also carry earthing and communication cables for the operation of the wind turbines. The cables would be laid on a sand bed and backfilled using suitably graded material. Topsoil would be stripped and restored to allow normal agricultural operations to resume around the turbine site.

3.3.3.2 Site Control Building

The control building (8 m by 5 m) would be required to house grid connection, metering and control infrastructure. This would be located near Turbine 3 as shown on the site plan in Appendix A.

3.3.3.3 Turbine Monitoring and Control

The turbine would be serviced at six monthly intervals by a qualified engineer, and during its operation it would be remotely monitored by Enercon SCADA (Supervisory Control and Data Acquisition). If a fault occurs it would be reported to the Enercon computer system and the appropriate service technicians would be informed.

3.3.4 Construction Programme

The construction period for the Ascog Wind Energy Project would last approximately nine months. The tracks and hard standing would be built in advance of the turbine installation. Normal hours of operation of construction would be between 08:00 and 18:00 Monday to Friday and between 08:00 and 13:00 Saturday in order to prevent disturbance to local residents. If working is required outside these hours, permission for short term extensions to

these hours would be sought from the Planning Authority as required. The construction programme would consist of the following principal operations, listed sequentially wherever possible⁸:

- Construction of temporary site office area and establishment of storage area for wind turbine components and temporary site facilities;
- Construction of site access tracks to wind turbine locations for use by civil engineering plant and construction equipment;
- Construction of wind turbine foundations and hard standing areas;
- Excavation of cable trench and cable laying;
- Erection of wind turbines;
- Connection of onsite electrical power and signal cables;
- Commissioning of the turbines; and
- Site reinstatement and restoration.

An indicative nine month programme for construction activities is shown in Table 3.1. The starting date for construction activities is largely dependent on the date that consent might be granted and therefore any delays to the programme start date would have a knock-on effect on subsequent activities.

Table 3.1: Indicative Construction Programme

Organisation	M1	M2	M3	M4	M5	M6	M7	M8	M9
Site office area etc	■								
Site access tracks		■	■						
Wind turbine foundations and hard standing			■	■					
Cable trench and cable laying					■	■			
Erection of wind turbines						■	■		
Electrical power and signal cables					■	■			
Commissioning of the turbines							■	■	
Site reinstatement and restoration									■

The final length of the programme is dependent on seasonal working and weather conditions. Summer months are favoured for construction due to longer periods of sunlight, therefore allowing longer (and safer) working days. In general, summer months are also drier which aids the construction process and reduces the impact of site debris reaching public highways (note that wheel washes would be installed where required). High winds and low

⁸ The development will be phased so that certain activities listed will take place concurrently.

temperatures can also have an effect on wind turbine erection and concrete pouring respectively. Section 5: Ecology identifies mitigation measures that will be adhered to during construction.

3.4 Construction Management

A Construction Method Statement (CMS) and Construction Environmental Management Plan (CEMP) would be produced for the Ascog Wind Energy Project. A CMS is engineering led whereas a CEMP is more focussed on environmental mitigation.

3.4.1 Construction Method Statement

The CMS would set out how the development would be constructed as well as detailing the mitigation measures required on site. These mitigation measures would include both specific mitigation measures as well as proposals for monitoring and emergency procedures. The CMS would be submitted to Argyll and Bute Council and bodies such as SEPA for comment prior to construction. A suitably qualified engineer would be employed for the construction of the wind energy project; their role would be to ensure that the CMS is being adhered to and to provide any specialist advice as required. The CMS would provide detail on the following:

- Fuels – it is not intended to store any fuel on site, however, if this were to change the CMS would detail fuel storage requirements on site;
- Concrete – the concrete used in the foundations would be a high strength structural grade, not prone to leaching alkalis;
- Wheel wash facilities on site – if required, a water supply would be provided at a suitable location;
- Health and Safety considerations – all work would be undertaken in accordance with the relevant Health and Safety legislation; the whole project would be supervised in accordance with the revised Construction Design and Management Regulations 2007 (CDM); and risk assessments would be undertaken prior to any activity taking place; and
- Dust and air quality considerations – an increase in dust is likely due to construction. The CDM would detail adequate mitigation measures for dust effects e.g. water bowsers, sheeting covering any stored aggregates etc.

3.4.2 Construction and Environmental Management Plan

The CEMP is proposed as the means to capture a diverse range of environmental management controls some compromising key elements of guidance to be adopted and adhered to and others compromising mitigation measures established to address topic specific effects. Each Section of this ES detailed the main measures proposed and expected to be incorporated into the CEMP. A typical structure of a CEMP is as follows:

- Project overview;
- Aims of environmental policy document;
- Approach to environmental management;
- Legislative requirements;
- Reference documents;
- Environmental approvals and consents;
- Change control process;
- Checklist for micro-siting works;
- General environmental management plans;
- Species protection plans;
- Environmental management plans;
- Environmental training;
- Monitoring plan;
- Emergency response procedures;
- Key contacts; and
- Appendices e.g. project timetable, mitigation register, site specific plans, designs plans (i.e. forestry and landscape), traffic management plan, waste management plan, noise management plan, community liaison plan, watercourse schedule, restoration plans, private water supplies information, borrow pit information, access management/rights of way plan.

3.5 Decommissioning

It is anticipated that the wind turbine would have a working life of 25 years following installation unless further permission for operation is sought and granted. On cessation of wind turbine operations all major equipment and structures would be removed from the site. The upper sections of the foundations would be removed to a depth which would permit the continuation of current agricultural practices. The crane hard standings would be removed and the affected area reinstated whilst the access tracks will be left in place for the

landowners' longer term use. All underground cables would be left in place. A decommissioning programme would be agreed with the relevant Planning Authority prior to decommissioning.

4 POLICY CONTEXT

An application for the development of a wind energy project should be assessed in the context of:

- National policy and guidance;
- The Local Authority Development Plan; and any
- Supplementary Planning Guidance.

All these issues are addressed in detail in the Planning Statement which accompanies the application, but this chapter presents a summary of the major prevailing renewable energy policies of relevance to the proposed development.

4.1 National Planning Policy

The publication of the National Planning Framework for Scotland 2 (NPF2) in 2009 and the Scottish Planning Policy 2010 (SPP) has seen changes in the Scottish Planning System.

4.1.1 National Planning Framework

NPF2 sets out the strategic development priorities to 2030, whilst SPP is the statement of The Scottish Government's policy on nationally important land use planning matters. SPP has superseded several National Planning Policy Guidelines (NPPG) and Scottish Planning Policy documents that were relevant to wind turbine installations. SPP also links planning policy with other legislation, such as the Climate Change (Scotland) Act 2009, to ensure that the proposed development is sustainable, encourages prudent use of natural resources and enhances the long term needs of the economy, society and environment.

4.1.2 Scottish Planning Policy

The Scottish Government's SPP is a statement of the Government's policy on land use and planning and contains:

- The Scottish Government's view of the purpose of planning;
- The core principles for the operation of the system and the objectives for key parts of the system;
- Statutory guidance on sustainable development and planning under Section 3E of the Planning etc. (Scotland) Act 2006;

- Concise subject planning policies, including the implications for development planning and development management; and
- The Scottish Government's expectations of the intended outcomes of the planning system.

4.1.3 2020 Routemap for Renewable Energy in Scotland

The Scottish Government published the 2020 Routemap for Renewable Energy in Scotland⁹ in 2011; this is an update and extension to the Scottish Renewables Action Plan 2009. The Routemap sets out the target to meet an equivalent of 100% demand for electricity from renewable energy by 2020. Targets and implications are set out in detail within the document.

The Routemap states that the Government is committed to the continued expansion of portfolio of onshore wind farms to help meet renewables targets, with a robust planning system providing spatial guidance, a clear policy framework and together with a timely and efficient processing of Section 36 Electricity Act and planning applications. It is recognised that seeking permission is one of the main challenges and accepts that there is a need to continue to streamline systems and work for greater speed and transparency, without sacrificing proper consideration of the impacts on the local environment.

4.1.4 Scottish Historic Environment Policy

The Scottish Historic Environment Policy (SHEP) (December 2011) sets out Scottish Ministers' policies, providing direction for Historic Scotland and a policy framework that informs the work of a wide range of public sector organisations. The SHEP complements and has the same authority of the SPP.

4.1.5 PAN 1/2011: Planning and Noise

Planning Advice Note (PAN) 1/2011, published in March 2011, promotes the principles of good acoustic design and a sensitive approach to the location of new development. It promotes the appropriate location of new potentially noisy development, and a pragmatic approach to the location of new development within the vicinity of existing noise generating uses, to ensure that quality of life is not unreasonably affected and that new development continues to support sustainable economic growth. Great care and attention has been taken

⁹ Scottish Government, 2011. 2020 Routemap for Renewable Energy in Scotland

both on the design and on the siting of the turbines to ensure that the development proposal is unlikely to have significant adverse noise impact.

4.1.6 PAN 2/2011: Planning and Archaeology

PAN 2/2011, published in July 2011, provides advice to planning authorities and developers on dealing with archaeological remains and does so with a fresh emphasis which is proportionate to the relative value of the remains and of the developments under consideration.

Great care and attention has been taken both on the design and on the siting of the turbine to ensure that the development proposal is unlikely to have significant adverse impact on any archaeological remains on, or in the vicinity of, the site.

4.1.7 PAN 51: Planning, Environmental Protection and Regulation

PAN 51, published in 2006, supports the existing policy on the role of the planning system in relation to the environmental protection regimes.

4.1.8 PAN 58: Environmental Impact Assessment

PAN 58, published in 1999, relates specifically to environmental impact assessment for development projects authorised under planning legislation.

4.1.9 PAN 60: Planning for Natural Heritage

PAN 60, published in August 2000, provides advice on how development and the planning system can contribute to the conservation, enhancement, enjoyment and understanding of Scotland's natural environment and encourages developers and planning authorities to be positive and creative in addressing natural heritage issues.

Great care and attention has been taken both on the design and on the siting of the turbine to ensure that the development proposal is unlikely to have significant adverse impact on the natural heritage of, or in the vicinity of, the site.

4.1.10 PAN 73: Rural Diversification

PAN 73, published in February 2005, recognises the importance of farming in the rural diversification process.

The development proposed by the applicant is in line with this diversification programme. The power created from the wind turbine would provide the main energy source for the existing farm uses. This would allow for the diversification of the income stream of the business thus enabling a greater growth of the business and a contribution to the sustainable economic growth of the area.

4.1.11 Onshore Wind Turbines: Policy Advice Updates, February 2011

This document replaces PAN 45 and provides detailed planning advice to local authorities in respect of planning policy considerations and to developers with respect to the preparation and submission of planning applications. Reference is made to a number of documents in the policy update, including the following:

- Renewables Trends in Scotland 2010;
- Visual assessment of windfarms best practice (2002); and
- Siting and designing windfarms in the landscape (Version 1) (2009).

As appropriate, due cognisance has been paid to these publications in the preparation of the application.

4.1.12 Managing Change in the Historic Environment Guidance Note Series

This series explains how to apply to policies contained in the Scottish Historic Environment Policy (2011) and The Scottish Planning Policy (2010).

4.2 Local Policy

4.2.1 Argyll and Bute Structure Plan 2002

The Structure Plan sets out strategic land use policies for the period to 2012. Among seven strategic issues for the Plan are the need to pursue regeneration strategies for Bute and Cowal focused on Rothesay and Dunoon and promoting regeneration and economically focussed initiatives for the west and islands and peninsular areas of Argyll and Bute. There is a strong emphasis throughout the plan on economic regeneration of the area provided this respects natural and environmental constraints.

The main areas of concern to the proposed development are contained within:

-
- Objective RE1 which seeks to promote and increase the level of renewable energy generation on Argyll and Bute both for local energy requirements and for export. Arrangements of three or more wind turbines are classed as 'wind farms' in the Structure Plan.
 - Policy STRAT RE1 encourages wind farm development where there are no significant adverse effects on communities, the natural environment, landscape character and visual amenity, etc.
 - Policy STRAT DC4 confirms that larger developments may be allowed where they can be successfully integrated with the landscape and where they provide a community or economic benefit. The proposals at Ascog Farm fall within such a Rural Opportunity Area and are likely to be considered as medium to large scale development.

The Structure Plan also sets out general policies which are relevant to the development at Ascog Farm, including:

- REC SI 4 – Renewable Energy Investment;
- STRAT SI 1 – Sustainable Development;
- STRAT DC 7 – Nature Conservation and Development;
- STRAT DC 8 – Landscape and Development Control;
- STRAT DC 9 – Historic Environment and Development Control; and
- STRAT AC 1 – Development in Support of Farms, Crofts and Estates

These, and other policies, have been considered in detail in the Planning Statement.

4.2.2 Argyll and Bute Local Plan 2009

The Local Plan re-establishes the importance of renewable energy generation in Argyll and Bute as stated in the Structure Plan.

Policies LP REN1 and LP REN2 deal with wind renewables, setting out the criteria against which proposals will be considered. These include effects on communities, nature conservation, landscape and visual amenity, core paths, historic sites, tourism, telecommunications and peat stability. As the later Chapters of this ES report, significant environmental effects are not predicted on the interests represented in these policies and the development is generally considered to be in compliance with the Local Plan. The Local Plan also identifies the area of the proposed development as a 'Rural Opportunity Area' which is

generally considered to have the capacity to absorb small scale development in the countryside.

The Local Plan also contains a number of other policies which are considered to be of relevance to the proposed Development, and these include:

- Policy LP ENV 1 – Development Impact on the General Environment;
- Policy LP ENV 2 – Development Impact on Biodiversity (i.e. biological diversity);
- Policy LP ENV 3 – Development Impact on European and Ramsar Sites;
- Policy LP ENV 5 – Development Impact on Sites of Special Scientific Interest (SSSIs);
- Policy LP ENV 6 – Development Impact on Habitats and Species;
- Policy LP ENV 8 – Development Impact on Local Nature Conservation Sites;
- Policy LP ENV 9 – Development Impact on National Scenic Areas (NSAs);
- Policy LP ENV 10 – Development Impact on Areas of Panoramic Quality;
- Policy LP ENV 11 – Development Impact on Historic Gardens and Designated Landscapes;
- Policy LP ENV 12 – Water Quality and Environment;
- Policy LP ENV 13a – Development Impact on Listed Buildings;
- Policy LP ENV 16 – Development Impact on Scheduled Ancient Monuments;
- Policy LP ENV 17 – Development Impact on Sites of Archaeological Importance;
- Policy LP ENV 19 – Development Setting, Layout and Design;
- Policy LP TOUR 2 – Safeguarding of Primary Tourist Areas; and
- Policy LP TRAN 1 – Public Access and Rights of Way.

4.2.3 Argyll and Bute Local Development Plan

A consultation was held during 2011 on the Main Issues Report of the emerging Local Development Plan (LDP). The Main Issues Report sets out a series of options and questions relating to policy proposals for Argyll and Bute which was used to support the consultation. The report notes that the policy framework for onshore wind will be reviewed as part of the LDP process. This will include the publication of supplementary guidance for onshore wind development to be based on a landscape capacity study.

The LDP Main Issues Report refers in Appendix B to proposals for Supplementary Planning Guidance (SPG) on renewable energy including onshore wind which will be based on a

landscape capacity study. Unfortunately the content of this SPG is still undergoing consultation and has not yet been released.

5 ECOLOGY

5.1 Introduction

This Chapter of the ES has been prepared by Frazer MacFarlane MIEEM of Horizon Ecology Ltd.

5.1.1 Objectives

The principal objectives for this assessment are to:

- Identify the habitats and species present in order to establish baseline conditions in the study area and determine their nature conservation value;
- Predict the nature and significance any of impacts during development construction and operational activities; and
- Determine measures to mitigate any identified impacts of significance on receptors during development, construction and operational activities.

To achieve these objectives, a series of desk studies and field surveys were carried out by Horizon Ecology Ltd. The extent of this ecology assessment excludes effects on ornithology, which are considered in Chapter 6.

5.2 Approach

5.2.1 Scope and Consultation

The scope of the ecology surveys was derived through consultation with SNH. An ecology desk-based survey was carried out in March 2011. This was used to supplement the EIA Scoping Opinion, received from Argyll and Bute Council and SNH in November and December 2010 respectively, in order to scope out the sensitive habitats and species, and to put forward an appropriate framework for survey work (see Appendix D for details of consultation).

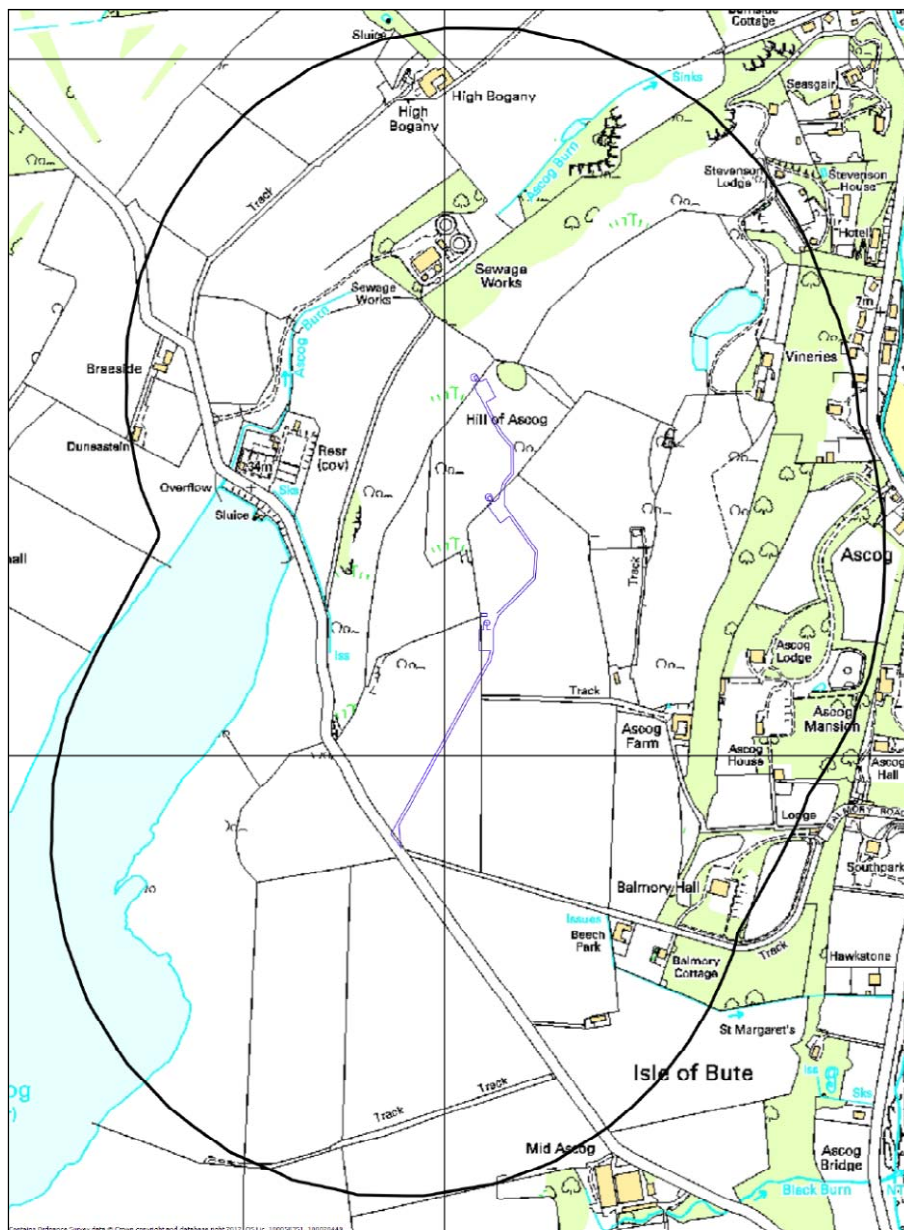
SNH responded in April 2011 confirming that the extent of survey work proposed is appropriate to the scale of the development and the ecological sensitivity of the site. The following ecological surveys were agreed:

- Extended Phase 1 Habitat Survey – one day survey in June/July 2011;

- Otter Survey – one day survey between June and August 2011; and
- Bat Survey – one day initial survey in May 2011. If present, three dawn and dusk surveys were proposed from May to August.

The extent of the study area under evaluation encompassed a 500 m envelope around the proposed site development area (Figure 5.1). This was considered adequate in respect of the nature and development scale and to account for any notable and/or protected habitats and species that may potentially be impacted by the proposal.

Figure 5.1: Ecology Study Area, Ascog Wind Energy Project



5.2.2 Regulations, Policy and Guidance Context

The ecological impact assessment completed in this Chapter is considered in the context of relevant legislation and policy guidance as described below:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive);
- The Conservation (Natural Habitats, & C.) Regulations 1994 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- The Nature Conservation (Scotland) Act 2004;
- Scottish Planning Policy (2010): Landscape and Natural Heritage – this sets out Scottish Government Guidance on how government policies for the conservation and enhancement of Scotland's natural heritage should be reflected in land use planning;
- Scottish Planning Policy PAN 60: Planning for Natural Heritage 2000;
- The UK Biodiversity Action Plan (BAP);
- Argyll and Bute Council Local Biodiversity Action Plan (LBAP);
- The Scottish Biodiversity List: Section 2 (4) Nature Conservation (Scotland) Act 2004;
- Protection of Badgers Act 1992; and
- Wildlife and Natural Environment (Scotland) Act, 2011.

5.2.3 Impact Assessment Methodology

The ecological impact assessment has been carried out according to current guidance published by the Institute of Ecology and Environmental Management (2006), which is recognised by statutory and conservation groups as best practice guidance. These guidelines set out a process of identifying the value of each ecological receptor and then characterising the effects that are predicted, before discussing the effects on the integrity or conservation status of the receptor, proposed mitigation and residual effects. Survey method and reporting standards are in adherence to acknowledged conventions.

5.2.4 Ecological Features Evaluation Criteria

A value or sensitivity has been assigned to each ecological receptor based on the following factors:

- Importance at a geographical scale, from local to international level;
- Designation status, e.g. Special Protection Area (SPA), Sites of Special Scientific Interest (SSSI), non-statutory designated sites, etc.;

- Biodiversity value, e.g. national BAP habitat/species, local BAP species, etc.; and
- Social, community and economic value.

The rationale for the evaluation of sensitivity has been included for each receptor for which a significant effect is predicted. Table 5.1 provides examples which are designed to give guidance as to how levels of sensitivity are typically derived. The value of sensitivity of an ecological receptor refers to land within the site development area and a recognised 500 m zone of effect.

Table 5.1: Guideline Definitions for the Sensitivity of Ecological Receptors

Sensitivity of Receptor	Examples (Guidance to Evaluation)
Very High International	<p>An internationally designated site or candidate site (SPA, possible SPA (pSPA), Special Areas of Conservation (SAC), possible SAC (pSPA), Ramsar site, Biogenetic Reserve) or an area which the country agency has determined meets the published selection criteria for such designation, irrespective of whether or not it has yet been notified.</p> <p>A viable area of a habitat type listed in Annex I of the Habitats Directive, EU 1992 or smaller areas of such habitat which are essential to maintain the viability of a larger whole.</p> <p>Any regularly occurring population of an internationally important species, which is threatened or rare in the UK, i.e. it is a UK Red Data Book species or listed as occurring in 15 or fewer 10 km squares in the UK (Categories 1 and 2 in the UK BAP) or of uncertain conservation status or of global conservation concern in the UK BAP.</p> <p>A regularly occurring, nationally significant population/number of any internationally important species.</p>

Sensitivity of Receptor	Examples (Guidance to Evaluation)
High National	<p>A nationally designated site (SSSI, Area of Special Scientific Interest (ASSI), National Nature Reserves (NNR), Important Bird Area, Marine Nature Reserve) or a discrete area, which the country conservation agency has determined meets the published selection criteria for national designation (e.g. SSSI selection guidelines) irrespective of whether or not it has yet been notified.</p> <p>A viable area of a priority habitat identified in the UK BAP, or of smaller areas of such habitat, which are essential to maintain the viability of a larger whole.</p> <p>Any regularly occurring population of a nationally important species, which is threatened or rare in the region or county (see local BAP).</p> <p>A regularly occurring, regionally or county significant population/number of any nationally important species.</p> <p>A feature identified as of critical importance in the UK BAP.</p>
Medium Regional	<p>Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat which are essential to maintain the viability of a larger whole.</p> <p>Viable areas of key habitat identified as being of Regional value in the appropriate Natural Area profile.</p> <p>Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16 to 100 10 km squares in the UK or in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation.</p> <p>A regularly occurring, locally significant number of a regionally important species.</p> <p>Sites, which exceed the County-level designations but fall short of SSSI selection guidelines, where these occur.</p>

Sensitivity of Receptor	Examples (Guidance to Evaluation)
Low County	<p>Semi-natural ancient woodland greater than 0.25 ha.</p> <p>County/Metropolitan sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves selected on County/metropolitan ecological criteria (County/Metropolitan sites will often have been identified in local plans).</p> <p>A viable area of habitat identified in County BAP.</p> <p>Any regularly occurring, locally significant population of a species which is listed in a County/Metropolitan “red data book” or BAP on account of its regional rarity or localisation.</p> <p>A regularly occurring, locally significant number of a County important species.</p>
Low District	<p>Semi-natural ancient woodland smaller than 0.25 ha.</p> <p>Areas of habitat identified in a sub-County (District/Borough) BAP or in the relevant Natural Area profile.</p> <p>District sites that the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves selected on District/Borough ecological criteria (District sites, where they exist, will often have been identified in local plans).</p> <p>Sites/features that are scarce within the District/Borough or which appreciably enrich the District/Borough habitat resource.</p> <p>A diverse and/or ecologically valuable hedgerow network.</p> <p>A population of a species that is listed in a District/Borough BAP because of its rarity in the locality or in the relevant Natural Area profile because of its regional rarity or localisation.</p> <p>A regularly occurring, locally significant number of a District/Borough important species during a critical phase of its life cycle.</p>
Very Low Parish (Local)	<p>Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or neighbourhood, e.g. species-rich hedgerows.</p> <p>A regularly occurring but low number of locally common protected species within or adjacent to the site development area.</p> <p>Local Nature Reserves selected on Parish ecological criteria.</p>

Sensitivity of Receptor	Examples (Guidance to Evaluation)
Very Low Very Local	Areas of habitat that have a limited ecological value. Plant assemblages tend to be species poor, but may be utilised by a small number of faunal species. Those habitats that have an effect of enriching and complimenting the local natural environment to a small degree.
Very Low Low	Areas of habitats considered to be of very limited ecological value. They are not representative of natural habitats and are very species poor. Those habitats that do not enrich the local natural environment.
NB: Where species habitats occur in more than one category, the highest value is applicable.	

5.2.5 Characterisation of Effects/Magnitude of Effect

The effects on individual receptors are described in relation to a range of factors. These include the magnitude, extent (either in area or population terms), duration, timing and frequency of the effect on the structure and function of the ecosystem. Effects in combination may have a cumulative effect that is greater than when the same effects occur in isolation. Combination effects include the separate effects of the wind energy project upon a feature (e.g. effects as a result of the construction and operation stage), or the combined effects of a number of schemes that affect the same receptor. Consideration is given to the longevity of effects, based upon the life span of the development and reversibility of the effect.

The criteria used to determine the character (magnitude, extent, nature, duration, timing/frequency and reversibility) of the ecological effects are given in Table 5.2.

Table 5.2: Definition of Terms Relating to the Character of Ecological Effects

Character/ Magnitude	Definition
Very High	<p>Total loss or very major alteration to key elements or features of the baseline conditions such that post development character, composition or attributes will be fundamentally changed and may be lost from the site altogether. For example the loss of a great crested newt breeding pond or loss/destruction of a maternity roost of a rare species of bat, loss/destruction of hibernation roost for bats, destruction of a Annex 1 priority habitat or a statutory designated site.</p> <p>Generally irreversible and permanent.</p> <p>Guide: >80% of population or habitat lost.</p>
High	<p>Major alteration to key elements or features of the baseline (pre-development) conditions such that post development character, composition or attributes will be fundamentally changed. For example the loss of a bat maternity roost, damage to a great crested newt breeding pond, pollution of a stream containing white clawed crayfish, damage to Annex 1 priority habitat.</p> <p>Generally reversible after long period of time.</p> <p>Guide: 20 to 80% of population or habitat lost.</p>
Medium	<p>Loss or alteration to one or more key elements or features of the baseline conditions such that post development character, composition or attributes of baseline will be partially changed. For example, loss of optimal foraging habitat for great crested newts, death or injury to a low number of a locally rare species, loss of species rich ancient hedgerow, severance of a bat flight path, temporary abandonment of a bat roost. Generally reversible with mitigation on a short timescale.</p> <p>Guide: 5 to 20% of population or habitat lost.</p>
Low	<p>Minor shift away from baseline conditions. Change arising from the loss or alteration will be discernible but underlying character, composition or attributes of baseline condition will be similar to pre-development circumstances or patterns. For example, loss of sub optimal foraging habitat for great crested newt, loss of species poor hedgerow, death or injury of a very small number of common species of bat.</p> <p>Generally reversible without mitigation in short timescale.</p> <p>Guide: 1 to 5% of population or habitat lost.</p>
Negligible	<p>Very slight change from baseline condition. Change barely distinguishable, approximating to the “no change” situation.</p> <p>Guide: <1% of population or habitat lost.</p>

5.2.6 Significance Criteria

An ecologically significant effect is defined as an effect (adverse or positive) on the integrity of the site or ecosystem(s) and/or the conservation status of habitats or species within the identified zone of effect for the development. The definitions of integrity and conservation used for this assessment are those detailed in the Institute of Ecology and Environmental Management (IEEM) Guidelines for Ecological Impact Assessment, namely:

- Integrity is the coherence of ecological structure and function, across a site's whole area, that enables it to sustain a habitat, complex of habitats and/or the levels of populations of species; and
- Conservation status for habitats is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area.

The combined assessment of the effect characterisation and the sensitivity of ecological receptors have been used to determine whether or not an effect is significant with respect to the EIA Regulations. These two criteria have been cross-tabulated to assess the overall significance of the effects in Table 5.3. Effects with significance of medium, high and very high are considered to be significant in terms of the EIA Regulations.

Table 5.3: Matrix Used to Assess the Significance of Potential Effects upon Ecological Receptors

Magnitude of Effect	Sensitivity of Receptor – Species or Habitats			
	Very High (International and National)	High (Regional and District)	Medium (Parish/(Local)	Low (Very Local/Low)
High	Very High	Very High	Medium	Low
Medium	Very High	High	Low	Very Low
Low	Medium	Low	Low	Very Low
Negligible	Low	Very Low	Very Low	Very Low

5.3 Baseline Conditions

An initial combination of desk based studies and consultations with the statutory and non-statutory bodies were carried out in 2011 to establish the baseline conditions at Ascog Farm

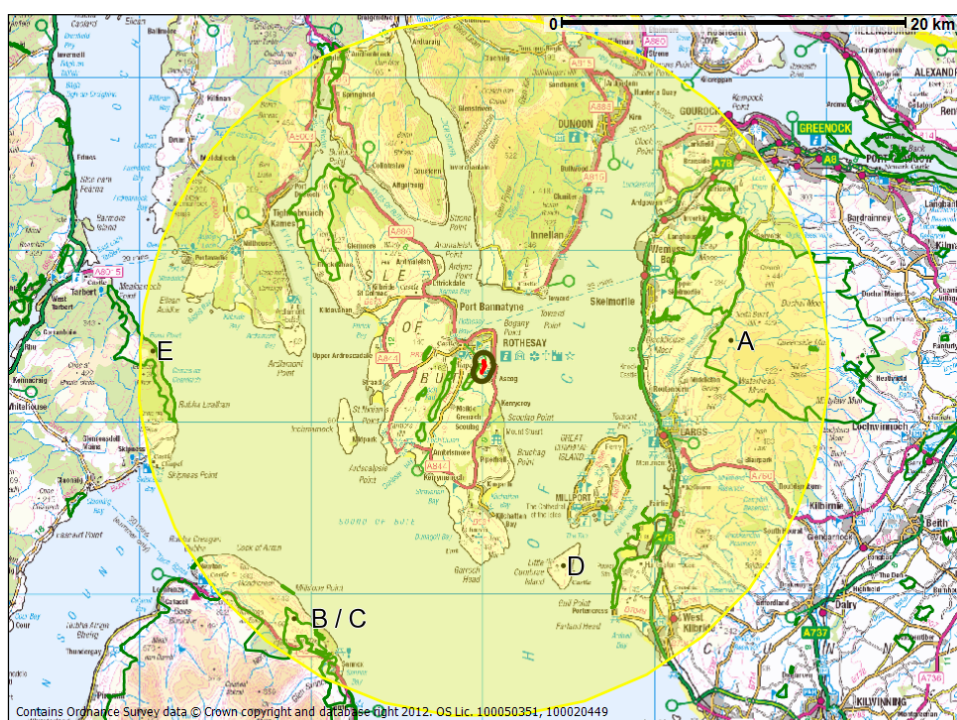
in order to identify existing information and to define a scope of survey works to inform the ecological assessment. Designated sites and associated protected species and habitats at a local and regional level have been identified through this process. A description of the local area in relation to designated sites with natural heritage interests and the findings of an initial desk based review of the area are presented in the context of the following Sections.

5.3.1 Designated Sites

The following ecological internationally protected sites were identified within 20 km of the site (Figure 5.2):

- A. Renfrewshire Heights Special Area of Conservation;
- B. Arran Moors Special Area of Conservation;
- C. Arran Moors Important Bird Area; and
- D. Tarbert Woods Special Area of Conservation.

Figure 5.2: International Site Designations within 20 km Radius of Ascog Wind Energy Project

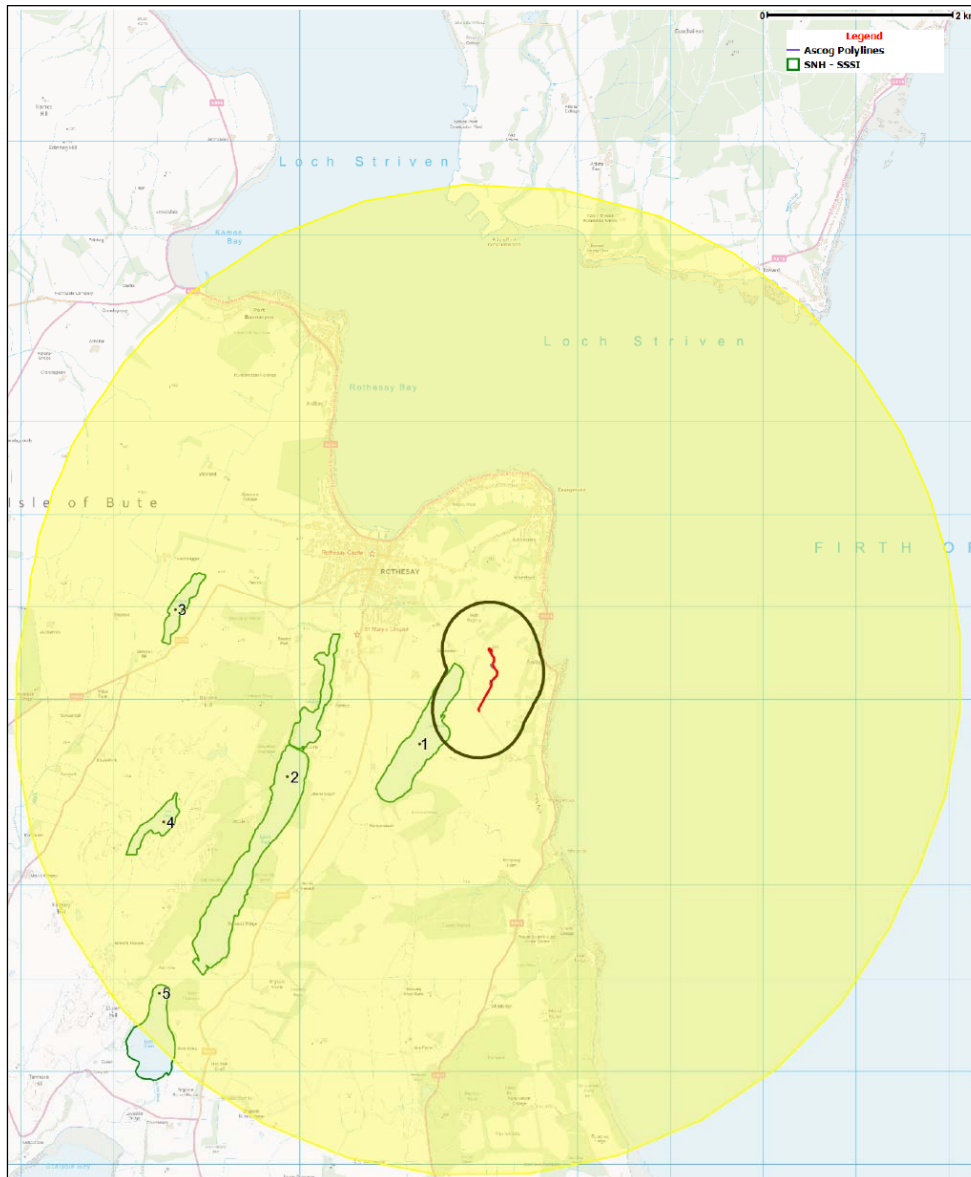


Within 5 km of the site, the following nationally designated ecologically protected sites were identified (Figure 5.3):

1. Central Lochs Site of Special Scientific Interest – Loch Ascog;
2. Central Lochs Site of Special Scientific Interest – Loch Fad;
3. Central Lochs Site of Special Scientific Interest – Greenan Loch;

4. Central Lochs Site of Special Scientific Interest – Loch Dhu; and
5. Central Lochs Site of Special Scientific Interest – Loch Quien.

Figure 5.3: National Site Designations within 5 km Radius of Ascog Wind Energy Project



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5.3.2 Site Baseline Conditions

The proposed three turbine wind energy project site at Ascog Farm is located on the Isle of Bute, approximately 1.3 km to the south-east of the town of Rothesay (Ordnance Survey (OS) central national grid reference – NS100633) (a detailed project description can be found in Chapter 3). The site topography at Ascog Farm rises from south to north reaching

the Hill of Ascog at an elevation of 104 m above sea level. Land then dips steeply into a valley to the north by a sewage and water treatment works, where Ascog Burn drains north-east from Loch Ascog which is designated as a Site of Special Scientific Interest. The site itself has an agricultural use throughout, with habitats reflecting this managed and highly modified land use. The field compartments are comprised of improved grassland, predominantly grazed by cattle and sheep with abundantly managed hedgerow boundaries and irrigation ditches. There are extensive areas of dense and scattered gorse scrub, some of which were cleared in 2011, along with some established banks close to the location of the proposed turbines. Residential dwellings, agricultural buildings and yards at Ascog Farm are found to the east of the site (see site plans in Appendix A).

5.4 Habitat Assessment

This Section considers the potential effects of the Ascog Wind Energy Project on the habitats on and around the proposed site and details relevant legislation, aims and objectives of the study, desk-based data review, methodology for field surveys and results.

5.4.1 Legislation

Legislation exists to protect habitats and floral species from destruction, degradation and loss as a result of development activities and include:

- The Conservation (Natural Habitats, & C.) Regulations 1994 (as amended)¹⁰;
- The Wildlife and Countryside Act 1981 (as amended)¹¹; and
- The Nature Conservation (Scotland) Act 2004¹².

5.4.2 Aims and Objectives

Horizon Ecology Ltd was commissioned by SAC to undertake an extended Phase 1 Habitat Survey at Ascog Farm. Whilst not a full botanical survey, the extended Phase 1 method enables a suitably experienced ecologist to obtain sufficient understanding of the ecology of a site so that it is possible either to:

- Confirm the conservation significance of the site and assess the potential for impacts on habitats/species likely to represent a material consideration in planning terms; or

¹⁰ Full details of The Conservation (Natural Habitats, & C.) Regulations 1994 (as amended) can be viewed at: <http://www.jncc.gov.uk/page-1379>

¹¹ Full details of the Wildlife and Countryside Act (1981) can be viewed at: <http://www.jncc.gov.uk/page-3614#download>

¹² Full details of the Nature Conservation (Scotland) Act 2004 can be viewed at: http://www.opsi.gov.uk/legislation/scotland/acts2004/asp_20040006_en_1

- Ascertain that further surveys of some aspect(s) of the site's ecology will be required before such confirmation can be made.

5.4.3 Data Review

An initial pre-visit review of OS maps and web-based satellite aerial imagery was initiated to familiarise with the site and to identify potential habitat features of nature conservation importance. These included evaluating topography and identifying presence of ecological features such as watercourses, standing waters, woodland and scrub, hedgerows and buildings.

In addition to information gathered from mapping, National Biodiversity Network (NBN) Gateway, SNH's Sitelink and Argyll and Bute Local Biodiversity Action Plan were consulted to establish the potential ecological value of the site, as outlined in Section 5.2.

5.4.4 Survey Methodology

A Phase 1 Habitat Survey was carried out on 18 April, 16 July and 16 August 2011 in suitable weather conditions (further details can be found in Appendix D). This is a standardised method of recording habitat types and characteristic vegetation, as set out in the Handbook for Phase 1 Habitat Survey – a technique for Environmental Audit (JNCC, 2010)¹³. This survey method is 'extended' through the additional recording of specific habitat features indicating the presence, or the potential to support, protected species of nature conservation significance.

The extended Phase 1 Habitat Survey was undertaken for the whole of the site project footprint to an extent of a 500 m envelope around the proposed turbine locations and associated infrastructure representing a total area of 152.20 hectares.

Target notes were made to describe characteristic habitats, features of ecological interest, or any other features which are considered to require ecologically sensitive design or mitigation (these can be found in Appendix D).

¹³ Aas, G & Reidmiller, A. 1994. Trees of Britain and Europe.
JNCC. 2010. Handbook for Phase 1 Habitat Survey – a technique for Environmental Audit
Rose, F. 2006. The Wild Flower Key.
Rose, F. 1989. Grasses, Rushes and Ferns of the British Isles and north – west Europe

By cataloguing habitats systematically, it was also possible to assess the potential value for protected species and survey for their presence or potential presence using standardised methods described in Sections 5.5 to 5.10 below.

5.4.5 Results

5.4.5.1 Data Review

Review of OS maps and aerial imagery established that the site at Ascog Farm is located within an open rural farmland locality. The main land use type is agricultural with improved grassland fields being the dominant habitat. Boundaries between fields comprise either post and wire fences or intact or defunct hedgerow. Areas of dense and scattered gorse scrub are widely distributed over the site with mature deciduous plantation woodland located to the east of site. Watercourses present include the Ascog Burn to the north, a pond to the east and the freshwater body Loch Ascog, located to the west. Dwellings, building structures and road access associated with Ascog Farm are found to the east of site.

Data searches including fungi, lichens, liverworts, mosses and flowering plants revealed the following known priority BAP/Local Biodiversity Action Plan (LBAP) habitats or associated flora species¹⁴:

- LBAP Habitats:
 - Improved grassland;
 - Ponds; and
 - Rivers and streams; and
- LBAP Species:
 - Bluebell *Hyacinthoides non-scripta*.

5.4.5.2 Field Survey

A summary of the habitat composition of the site is detailed in Table 5.4. The habitats contained within the survey area are presented graphically in Appendix D while target notes and a non-exhaustive species list are also provided in Appendix D.

¹⁴ UK BAP vascular species
Argyll and Bute Local Biodiversity Action Plan
Isle of Bute Rare Plant Register

Table 5.4: Phase 1 Habitat Types within the Site Survey Area

Phase 1 Habitat Type	Area (ha)	% of Total Survey Area
B4 Improved grassland	56.2	36.92
B2.2 Neutral grassland - semi-improved	24.42	16.04
J5 Other habitat	20.94	13.76
G1 Standing water	13.44	8.83
A2.2 Scrub – scattered	10.2	6.70
A1.1.2 Broadleaved woodland – plantation	10.14	6.66
A3.1 Broadleaved Parkland/scattered trees	5.02	3.31
J1.2 Cultivated/disturbed land – amenity grassland	2.97	1.95
J1.1 Cultivated/disturbed land – arable	2.49	1.64
C1.2 Bracken – scattered	1.89	1.25
J3.6 Buildings	1.6	1.05
C3.1 Other tall herb and fern – ruderal	1.3	0.85
A2.1 Scrub – dense/continuous	1.12	0.73
J1.3 Cultivated/disturbed land – ephemeral/short perennial	0.2	0.13
J4 Bare ground	0.17	0.12
A1.2.2 Coniferous woodland – plantation	0.1	0.06
Total	152.2	100.00

Boundary Features

Phase 1 Habitat Type	Length/Extent
G2 Running water	1,383 m
J2.1.2 Intact hedge – species – poor	Occasional
J2.2.2 Defunct hedge – species – poor	Extensive
J2.3.2 Hedge with trees – species – poor	Occasional
J2.4 Fence	Extensive
J2.5 Wall	Occasional

5.5 Otters (*Lutra lutra*)

This Section considers the potential effects of the Ascog Wind Energy Project on otters on and around the proposed site and details relevant legislation, aims and objectives of the study, desk-based data review, methodology for field surveys and results.

5.5.1 Legislation

Both otters and their habitats are protected in law:

- Otters are protected under European law (European Protected Species), in Annexes II and IV of the EC Directive (92/43);
- The Conservation of Natural Habitats and of Wild Fauna and Flora (The Habitats Directive 1994). Under these regulations it is an offence to deliberately or recklessly:
 - Capture, injure or kill a wild animal of a European protected species;
 - Harass a wild animal or group of wild animals of a European protected species;
 - Disturb such an animal while it is occupying a structure or place which it uses for shelter or protection;
 - Disturb such an animal while it is rearing or otherwise caring for its young;
 - Obstruct access to a breeding site or resting place of such an animal, or otherwise to deny the animal use of the breeding site or resting place;
 - Disturb such an animal in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species to which it belongs;
 - Disturb such an animal in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; or
 - Damage or destroy a breeding site or resting place of such an animal;
- Any breeding holt or resting place located within 30 m of a proposed development corridor is considered sensitive and a license from SNH would be required before works would be permitted to proceed; and
- Otters are listed as a UK BAP and Argyll and Bute LBAP species.

5.5.2 Aims and Objectives

The aims of this assessment were:

- To assess whether otters were present on site;
- If present, to assess the extent of usage of the site; and
- To provide mitigation measures that will result in residual non-significant effects for the receptor if required.

5.5.3 Data Review

Results of the extended Phase 1 Habitat Survey which identified suitable otter habitat were consulted (Section 5.4). In addition, consultation with SNH and NBN data searches were carried out to establish if any records of otters exist on site or the wider area. Other sources as outlined in Section 5.2 were also consulted.

5.5.4 Survey Methodology

Otter surveys were carried out on 18 April, 16 July and 16 August 2011 in accordance with recommended standards and guidelines¹⁵. The walkover of all watercourses and terrestrial habitats consisted of a search to an extent of 500 m buffer around the proposed turbine locations and associated infrastructure to establish the sites' actual or potential for supporting otters (Appendix D).

Evidence of otter activity searched for included:

- Holts: otter holts are often found in various situations. These include cavities in a river bank, hollow trees, between roots, rocky clefts, rabbit burrows or tunnels in peat. The entrance may be underwater with an air vent into the chamber, which is lined with dry vegetation;
- Couches: otters often have resting spots or couches when they lay up. An otter may have many holts or resting sites within its home range;
- Paw prints in muddy or silted areas along the burn edges;
- Spraints (otter faeces): often found on boulders, under bridges, elevated positions, fallen trees or on piles of grass; and
- Characteristic worn pathways/slides or haul out areas.

Otters can be surveyed for presence at any time of year. Good survey practice was observed ensuring at least two dry days before surveying a watercourse as heavy rain can wash away evidence of sprainting, footprints and other signs of presence and activity.

¹⁵ National Rivers Authority 1993. Otters and river habitat management. Conservation Technical Handbook 3
JNCC 2004. Common Standards Monitoring Guidance for Mammals.
Chanin P. 2003. Ecology of the European Otter. Conserving Natura 2000 Rivers Ecology
Liles G. (2003) Otter Breeding Sites. Conservation and Management. Conserving Natura 2000
Forestry Commission Scotland 2009. Forest Operations and Otters in Scotland.
Strachan, R. 2007. National survey of otter *Lutra lutra* distribution in Scotland 2003–04.
Scottish Natural Heritage 2008. Otters and Development.

5.5.5 Results

5.5.5.1 Data Review

No records of the species were found for the study area. An NBN search of 10 km squares NS06 and NS16 reveal several records of otter:

- Kerrycroy Bay – NS108613: Scotland Otter Database 1991;
- Glenmore Burn Mouth – NS032666: Scotland Otter Database 1984;
- Kames Bay Burn – NS066675 – Scotland Otter Database 1991; and
- Loch Fad- NS074609 – Scotland Otter Database 1991.

5.5.5.2 Field Survey

Signs of otter presence and activity were recorded in the study area during the walkover. A fresh otter spraint was recorded at Loch Ascog dam head at NS0968563378 on 16 July 2011 (Appendix D). This is 377 m west of the nearest turbine at NS1006463371. No otter signs or suitable breeding holts or resting places were found within 30 m of the project footprint.

5.6 Badgers (*Meles meles*)

This Section considers the potential effects of the Ascog Wind Energy Project on badgers on and around the proposed site and details relevant legislation, aims and objectives of the study, desk-based data review, methodology for field surveys and results.

5.6.1 Legislation

Both badgers and their setts are protected by law. The Protection of Badgers Act 1992 (as amended in Wildlife and Natural Environment (Scotland) Act 2011) brings together all of the previous legislation specific to badgers (except their inclusion on Schedule 6 of the 1981 Wildlife and Countryside Act as amended by the Nature Conservation (Scotland) Act 2004). As a result it is an offence to:

- Willfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so;
- To intentionally or recklessly interfere with a sett;
- To disturb a badger when it is occupying a sett;
- Damage or destroy a sett; and
- To obstruct access to, or any entrance of a badger sett.

A badger sett is defined in the legislation as '*any structure or place, which displays signs indicating current use by a badger*'. 'Current use' does not simply mean 'current occupation' and for licensing purposes it is defined as '*any sett within an occupied badger territory regardless of when it may have last been used*'. A sett therefore, in an occupied territory, is classified as in current use even if it is only used seasonally or occasionally by badgers, and is afforded the same protection in law.

5.6.2 Aims and Objectives

The aims of this assessment were:

- To assess whether badgers were present on site;
- If present, to assess the extent of usage of the site; and
- To provide mitigation measures that will result in residual non-significant effects for the receptor if required.

5.6.3 Data Review

Results of the extended Phase 1 Habitat Survey which identified suitable badger habitat were consulted (Section 5.4). In addition, consultation with SNH and NBN data searches were carried out to establish if any records of badgers exist on site or the wider area. Other sources as outlined in Section 5.2 were also consulted.

5.6.4 Survey Methodology

Badgers surveys were carried out on 18 April, 16 July and 16 August 2011, in accordance with the recommended guidelines¹⁶. The walkover of all terrestrial habitats consisted of a search to an extent of 500 m buffer around the proposed turbine locations and associated infrastructure to establish the sites' actual or potential for supporting the species (Appendix D). In particular attention was paid to the inspection of hedgerows, scrub, ditches and banks as these features are particularly likely to support badger setts. Evidence of badger activity searched for included:

- Setts: badger setts typically have characteristic shapes and dimensions;

¹⁶ Clark, M. 2007. Badgers.

Harris, S., Cresswell, P. & Jefferies, D. 1989. Surveying for badgers.

Cresswell, P., Harris, S. and Jefferies, D.J. 1990. The History, Distribution, Status and Habitat Requirements of the Badger in Britain.

Scottish Natural Heritage. 2002. Badgers and Development.

- Paw prints and badger hair caught on hedges and fences;
- Foraging signs: foraging badgers leave distinctive marks when foraging;
- Characteristic worn pathways; and
- Latrines: badgers defecate in pits, often clustering several pits into a latrine.

5.6.5 Results

5.6.5.1 Data Review

No records of the species were found for the study area. An NBN search of 10 km squares NS06 and NS16 reveal one record of badgers:

- NS06 1960 – 1994 (Mainland Argyll) – mammal records from Britain from the Atlas of Mammals (1993).

5.6.6 Field Survey

No signs of badger presence or activity were recorded on site during the walkover.

5.7 Water Vole (*Arvicola amphibius*)

This Section considers the potential effects of the Ascog Wind Energy Project on water vole on and around the proposed site and details relevant legislation, aims and objectives of the study, desk-based data review, methodology for field surveys and results.

5.7.1 Legislation

The water vole is in sharp decline in the UK therefore their habitat is protected and is listed on Schedule 5 of the Wildlife and Countryside Act (1981) (as amended) in respect of Section 9(4) only. This legislation makes it an offence to deliberately or recklessly:

- Damage;
- Destroy;
- Obstruct access to any structure or place used for shelter; or
- Disturb water voles while they are using such a place.

5.7.2 Aims and Objectives

The aims of this assessment were:

- To assess whether water voles were present on site;
- If present, to assess and the extent of usage of the site; and
- To provide mitigation measures that will result in residual non-significant effects for the receptor if required.

5.7.3 Data Review

Results of the extended Phase 1 Habitat Survey which identified suitable water vole habitat present on site were consulted (Section 5.4). In addition, consultation with SNH and NBN data searches were carried out to establish if any records of water voles exist on site or the wider area. Other sources as outlined in Section 5.2 were also consulted.

5.7.4 Survey Methodology

Water vole surveys were carried out on 18 April, 16 July and 16 August 2011, in accordance with the recommended guidelines¹⁷. During the extended Phase 1 Habitat Survey, any watercourses and ditches were surveyed, searching for evidence of field signs of water vole, as recommended by the Water Vole Conservation Handbook (Strachan & Moorhouse, 2007) including:

- Faeces – recognisable by their size, shape and content, and (if not too dried out) also distinguishable from rat droppings by their smell;
- Latrines – faeces are often deposited at discrete locations know as latrines;
- Feeding stations – food items are often brought to feeding stations along pathways and haul out platforms, recognisable by neat piles of chewed vegetation up to 10 cm long;
- Burrows – appear as a series of holes along the water's edge distinguishable from rat burrows by size and position;
- Lawns – may appear as grazed areas around land holes;
- Nests – where the water table is high, above ground woven nests may be found;
- Footprints – tracks may occur at the water's edge and lead into vegetation cover, may be distinguishable from rat by size; and
- Runways in vegetation – low tunnels pushed through vegetation near the water's edge.

¹⁷ Strachan, R. The Water Vole Conservation Handbook.

5.7.5 Results

5.7.5.1 Data Review

No records of the species were found for the study area. An NBN search of 10 km squares NS06 and NS16 reveal two record of water vole:

- NS06: 1736 to 1959. Mammal records from Britain from the Atlas of Mammals (1993); and
- NS06: 1960 to 1994. Mammal records from Britain from the Atlas of Mammals (1993).

5.7.5.2 Field Survey

No signs of water vole presence or activity were recorded on site during the extended Phase 1 Habitat Survey.

5.8 Bats (*Chiroptera*)

This Section considers the potential effects of the Ascog Wind Energy Project on bats on and around the proposed site and details relevant legislation, aims and objectives of the study, desk-based data review, methodology for field surveys and results.

5.8.1 Bat Legislation

All bat species in the UK are afforded full statutory protection as European protected species, listed on Schedule 2 of The Conservation (Natural Habitats, & C.) Amendment (Scotland) Regulations 2007 which transpose into Scottish law the European Community's Habitats Directive (92/43/EEC).

Following recent changes to legislation in Scotland, under this law it is illegal to intentionally or recklessly kill or injure a bat, to disturb a roosting bat or to damage, destroy or obstruct access to any bat roost. This applies to both summer and winter roosts, which may be in different structures. Any action which is likely to disturb or damage a bat roost requires a licence from SNH.

5.8.2 Aims and Objectives

The aims of this assessment were:

- To assess whether bat species were present on site;
- If present, to assess and the extent of usage of the site; and
- To provide mitigation measures that will result in residual non-significant effects for the receptor if required.

5.8.3 Data Review

An initial pre-visit consultation with OS maps and web-based satellite aerial imagery was initiated to identify suitable bat habitat features. These included potential roosts such as building structures and trees, and also commuting and foraging features including linear habitats such as woodland edge, scrub, hedgerows, watercourses and standing waters.

In addition, consultation with SNH and NBN data searches were carried out to establish if any records of bat species exist on site or the wider area. Other sources as outlined in Section 5.2 were also consulted.

5.8.4 Survey Methodology

Following reviews of desk studies and consultations, it was considered that the overall level of survey visit effort undertaken below was adequate and proportionate to the baseline conditions present on site, the nature and scale of the proposal and in relation to published guidance¹⁸ (Table 5.5).

5.8.4.1 Bat Habitat Assessment

An initial daytime bat habitat assessment survey was carried out on the site on 30 March 2011. The site was surveyed for potential flight lines/commuting routes, roosts and foraging areas and the habitat assessed for its overall suitability for bats.

¹⁸ Bat Conservation Trust. 2007. Bat Surveys – Good Practice Guidelines.
 Entwistle, A.C., Harris, S., Hutson, A.M., Racey, P.A., Walsh, A. 2001. Habitat management for bats: A guide for land managers, land owners and their advisors.
 Mitchell-Jones, A.J. (Ed). 2004. Bat Mitigation Guidelines. English Nature
 Mitchell-Jones, A.J. & McLeish, A.P. (Ed). 2004. Bat Workers' Manual.
 Mitchell-Jones, A.J. & Schofield, H.W. 2003. The Bats of Britain & Ireland. The Vincent Wildlife Trust.
 Natural England Technical Information Note TIN059. 2009. Bats and Single large wind turbines
 Natural England Technical Information Note TIN051. 2009. Bats and onshore wind turbines: Interim Guidance.
 Richardson, P. 2007. Distribution Atlas of Bats In Britain and Ireland: 1989 - 1999.
 Russ, J. 1999. The Bats of Britain & Ireland: Echolocation Calls, Sound Analysis and Species Identification.

The outside of buildings around Ascog Farm were visually inspected and using 10 x 40 binoculars. The buildings were checked for any potential bat access points, droppings on walls or windows, urine stains, grease marks or other indications that a roost was present.

Some potential tree roost sites were checked using 10 x 40 binoculars where possible. Particular emphasis was paid to see if potential roost cavities were available. This was not a detailed survey but was intended to determine the suitability of the buildings and trees for bat roosts.

Any potential foraging areas were examined and tree lines and linear features were assessed for their suitability as flight lines or commuting pathways.

5.8.4.2 Bat Presence Survey

Following the initial daytime habitat assessment, which identified suitable bat features (Appendix D), a dusk walkover detector survey was undertaken on 20 May 2011 to establish bat presence and provide an indication of bat activity over the site. The objectives of this reconnaissance survey were to confirm if bats were using the site, identify species present and to provide an indication of habitats used.

5.8.4.3 Bat Activity Transect and Roost Surveys

Based upon reconnaissance survey, which confirmed presence of bats on site, a further three dusk and night activity transect surveys were undertaken between June and August 2011, together with a dawn roost search survey in September 2011, in accordance with guidance from the Bat Conservation Trust and Natural England. The targeted dusk transect surveys were carried out from approximately 30 minutes before sunset to 2 hours after sunset. The site was divided into two circular transects, west and east areas, to ensure that all features that may be used by bats were sampled. The two transects were focused on the three proposed turbine locations with strategic stopping points. These points encompassed all habitats found on site and included points to a minimum of 50 m radius of the proposed turbine locations, also including tree lines, wooded areas, water features, tracks and open ground (Appendix D). The transects were surveyed constantly by two individual surveyors starting at opposite ends of the transect on each visit. Bats were surveyed at all times and at stopping points using Bat Box ultrasound bat detectors in conjunction with a mini-disc inline recorder between 20 and 120 MHz. Any potential bat calls on the mini discs were analysed using the Bat SoundTM software package and identified to species level. All transects were

walked twice with 5 minute listening stops with the detector continuously on. Table 5.5 summarise the bat survey times and weather conditions on site.

In addition to activity transects, a dawn roost return count was also undertaken at a residential building east of Ascog Farm on 1 September 2011.

Table 5.5: Bat Survey Times and Weather Conditions

Survey	Survey Area	Date	Sun Rise	Sun Set	Start	End	Weather Conditions
Bat Habitat Assessment (Day)	Site	30/03/2011	06.55	19.55	09.40	17.35	Cloud Cover 8/8 Wind W2-5 Temp. 10-12C Visibility > 2km
Bat Presence Survey (Dusk)	Site	20/05/2011	05.00	21.32	21.02	23.32	Cloud Cover 3/8 Wind W1-2 Temp. 10C
Activity Transect 1 of 3 Dusk & Night	Site	28/06/2011	04.37	22.09	21.39	00.09	Cloud Cover 1-2/8 Wind SW1-2 Temp. 7-11C.
Activity Transect 2 of 3 Dusk & Night	Site	26/07/2011	05.12	21.40	21.10	23.40	Cloud Cover 2/8 Wind NW1-2 Temp. 13-15C
Activity Transect 3 of 3 Dusk & Night	Site	27/07/2011	05.13	21.42	03.15	05.45	Cloud Cover 5/8 Wind NW2 Temp. 12-13C
Roost Search Survey (Dawn)	Site & Offsite	01/09/2011	06.25	20.16	04.25	06.55	Cloud Cover 8/8 Wind W1 Temp. 7-10C

5.8.5 Results

5.8.5.1 Data Review

An NBN search of the 10 km squares NS06 revealed no bat records while NS16 reveals one record of bat species:

- Bat Records for Scotland 1970 to 2007: Soprano pipistrelle *Pipistrellus pygmaeus*.

5.8.5.2 Habitat Survey Results

The extended Phase 1 Habitat Survey identified suitable potential habitat features present on site to support bat species (Appendix D).

Building Roosts

It was not possible to physically check the interior of all buildings and private dwellings within the study area at Ascog Farm for roosts. Assessment of Ascog Farm at NS1034163042 considered the structure offered potential to provide bat roosts, however inspections revealed no signs of bats.

Tree Roosts

Ample mature deciduous trees on the east of the survey area at NS1044363333 present the potential to provide bat roosts and also foraging opportunities along woodland edges.

Foraging Areas and Commuting Pathways

Potential foraging area and flight line routes occur most favourably where linear habitat features occur over the site. Good quality foraging areas are available along intact hedgerows to the south of the proposed wind energy project and also to the east along linear woodland edge, scrub, and by a pond found over the east of the site area.

5.8.5.3 Presence Survey Results

Following on from the daytime assessment, which identified suitable bat habitat features, the bat presence survey focussed upon these features found on site. This survey confirmed bats were active on the site. One species was recorded present, soprano pipistrelle *Pipistrellus pygmaeus* with five individual bats detected commuting from the east site area by Ascog Farm and commuting westwards to Loch Ascog area after dusk (Appendix D).

5.8.5.4 Bat Detector Activity Survey Results

Over the two combined transect surveys undertaken between June and August 2011, one bat species was recorded over the site: soprano pipistrelle *Pipistrellus pygmaeus*, with a minimum of fifty-five bats recorded on site on each visit¹⁹ (Appendix D).

One primary commuting flight pathway route and one key foraging area was identified during this phase of the bat study. Bat activity was mostly focussed over the south area of site, mainly at stopping point 1, 2 and 6 (Appendix D).

This primary commuting flight line pathway and foraging area is approximately 92 m south of nearest proposed Turbine 1 at NS1006163191 and 326m from the foraging area of Loch Ascog.

A minor commuting pathway route was also recorded, located along the east of site along linear woodland edge and scrub although low numbers of bats were recorded during surveys. This minor commuting route is approximately 296 m east of nearest proposed Turbine 2 at NS1006463371.

No bat roosts were confirmed within 50 metres of the proposed Development area during any bat survey visits.

Based upon results of transect activity surveys, the likely source of bat activity was located at a residential building roost east of Ascog Farm at Ascog Estate at NS10061 63191. A dedicated dawn roost search revealed a total of 85 soprano pipistrelle bats swarming and several confirmed entries to this building. This roost is approximately 473 m east-south-east of the nearest proposed turbine (Turbine 1) at NS1006163191 (Appendix D). Table 5.6 provides a summary of bat activity recorded on transect surveys at Ascog Farm.

¹⁹ A maximum of 85 individual bats were recorded on any one bat transect and dedicated dawn roost survey between June and September 2011.

Table 5.6: Summary of Bat Activity levels (Total Number of Passes) Recorded on Transect Surveys

Transect Visit	Species	Primary Pathway	Minor Pathway
June 2011	Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	55	10
July 2011	Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	125	13
August 2011	Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	128	12

5.9 Red Squirrels (*Sciurus vulgaris*)

This Section considers the potential effects of the Ascog Wind Energy Project on red squirrels on and around the proposed site and details relevant legislation, aims and objectives of the study, desk-based data review, methodology for field surveys and results.

5.9.1 Legislation

The red squirrel is protected by its inclusion on Schedules 5 and 6 of the Wildlife and Countryside Act 1981 as amended by the Nature Conservation Scotland Act 2004. The following provides a brief summary of the provision of this legislation, under which it is an offence to intentionally or recklessly:

- Kill, injure or take any red squirrel;
- Have possession or control of any red squirrel, or any part of, or anything derived from a red squirrel unless it can be proven that it was obtained lawfully;
- Damage, destroy, or obstruct access to any structure or place used by a red squirrel for shelter or protection;
- Disturb a red squirrel while it is occupying a structure or place used for shelter or protection;
- Sell, offer or expose for sale, or have for the purpose of sale any red squirrel;
- Publish or cause to be published any advertisement likely to infer that squirrels can, or are intended to be bought or sold; and
- Use certain indiscriminate methods of taking red squirrels, such as snaring or poisoning.

Red squirrels are also protected under the Wild Mammals (Protection) Act 1996 and Appendix III of the Bern Convention.

5.9.2 Aims and Objectives

The aims of this assessment were:

- To assess whether red squirrels were present on site;
- If present, to assess and the extent of usage of the site; and
- To provide mitigation measures that will result in residual non-significant effects for the receptor if required.

5.9.3 Data Review

Results of the extended Phase 1 Habitat Survey which identified suitable red squirrel were consulted (Section 5.4). In addition, consultation with SNH and NBN data searches were carried out to establish if any records of red squirrels exist on site or the wider area. Other sources as outlined in Section 5.2 were also consulted.

5.9.4 Survey Methodology

During the extended Phase 1 Habitat Survey within the survey boundary, the following field signs were searched for using standard methods and guidelines²⁰:

- Sightings;
- Tracks;
- Hairs;
- Dreys; or
- Eaten pine cones.

5.9.5 Results

5.9.5.1 Data Review

No records of the species were found for the study area. An NBN search of 10 km squares NS06 and NS16 reveal two record of red squirrel:

- NS06: 1736 to 1959. Historical occurrence. Mammal records from Britain from the Atlas of Mammals (1993); and

²⁰ Forestry Commission. 2009. Practical techniques for surveying and monitoring squirrels.
Gurnel J., Lurz P, McDonald P and Pepper, H. 2009 Practice Note – Practical Techniques for Survey and Monitoring Squirrels,
Scottish Natural Heritage 1998. Red Squirrels.

- NS16: 1998 to 2010 – Current occurrence – Mainland Argyll – The Scottish Squirrel Database.

5.9.5.2 Field Survey

No signs of red squirrel presence or activity were recorded on site during the walkover.

5.10 Pine Marten (*Martes martes*)

This Section considers the potential effects of the Ascog Wind Energy Project on pine martens on and around the proposed site and details relevant legislation, aims and objectives of the study, desk-based data review, methodology for field surveys and results.

5.10.1 Legislation

Pine martens are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Various methods of capturing or killing pine martens are also listed in the Conservation (Natural Habitats, & C.) Regulations 1994 (as amended).

The following provides a summary of the offences in the Wildlife and Countryside Act 1981 (as amended) in relation to wild pine martens.

It is an offence to intentionally or recklessly:

- Kill, injure or take a wild pine marten;
- Damage, destroy or obstruct access to any structure or place which such an animal uses for shelter or protection (a nest or den);
- Disturb such an animal when it is occupying a structure or place for that purpose; and
- Possess or control, sell, offer for sale or possess or transport for the purpose of sale any live or dead wild pine marten or any derivative of such an animal.

5.10.2 Aims and Objectives

The aims of this assessment were:

- To assess whether pine marten were present on site;
- If present, to assess and the extent of usage of the site; and
- To provide mitigation measures that will result in residual non-significant effects for the receptor if required.

5.10.3 Data Review

Consultation NBN was carried out to establish if any records of pine martens exist on site or the wider local area. Other sources as outlined in Section 5.3 were also consulted.

5.10.4 Survey Methodology

Favoured pine marten habitats include native conifer woodland, also commercial conifer woodland plantation and insulated buildings. Any suitable habitat for pine marten was searched during the extended Phase 1 Habitat Survey using standard methods and guidelines²¹. Evidence of presence searched for included:

- Sightings;
- Footprints; and
- Droppings.

5.10.5 Results

5.10.5.1 Data Review

No records of the species were found for the study area. An NBN search of 10 km squares NS06 and NS16 reveal one record of pine marten:

- NS16: 1736 to 1959 – Historical occurrence. Mammal records from Britain from the Atlas of Mammals (1993).

5.10.5.2 Field Survey

No signs of pine marten presence or activity were recorded on site during the walkover.

5.11 Evaluation of Habitats and Species

This section provides an evaluation of the potential effects of the Ascog Wind Energy Project on habitats, and protected fauna (otters, bats and other fauna)²².

²¹ Macdonald, D.W., Mace, G. & Rushton, S. 1998. Proposals for future monitoring of British mammals. Hill, D, Fasham, M, Shaw, P, Shewry, M & Tucker, G. 2007. Handbook of Biodiversity Methods: Survey, Evaluation and Monitoring
Sargent, G & Morris, P. 2003. How to Find and Identify Mammals.

²² As recommended by the Institute of Ecology and Environmental Management (2006) *Guidelines for Ecological Impact Assessment in the United Kingdom* (version 7 July 2006).

5.11.1 Habitats

The site at Ascog Farm supports only common and widespread habitats and species associated with lowland agricultural land use. A total of 16 major habitat types are present within the site survey area, of which improved grassland covers a large proportion (Section 5.4 and Appendix D). This is the main habitat found over the proposed site development area.

Three LBAP habitats are found within the ecology study area which are of local value: improved grassland, ponds and rivers and streams. The combination of intensive agricultural management of habitats which dominate Ascog Farm limits botanical interest over the site. The only LBAP species of local significance found was Bluebell *Hyacinthoides non-scripta* (Appendix D).

Commonly occurring scrub vegetation found in proximity to the turbine layout offers some opportunities for mammals to utilise for cover, shelter and feeding, with good access to open fields. These habitats may offer varying value to other small mammals, birds, reptiles and invertebrates.

Boundary features consist extensively of fence and post structures with widespread scrub, intact and defunct hedges. These habitat features offer ecological value to invertebrates and other small fauna. Water features in the study area comprise of a pond over the east site offering opportunities for invertebrates and amphibians.

To the west, Loch Ascog forms part of Central Lochs SSSI is of national value for supporting aggregations of Greylag geese (Section 5.2). To the north-west, Ascog Burn also offers potential to support flora and fauna.

5.11.2 Protected Fauna

5.11.2.1 Otters

The presence of signs of otters at Loch Ascog indicates use of this water body as habitat for feeding and foraging (Section 5.5). Ascog Burn is also likely to be used as a commuting passageway north-east to Ascog Bay. No holts were located in the immediate site development area or at Loch Ascog and Burn or in the wider study area. Ascog Burn offers good potential for resting areas though none were found. The main area of the site where

the infrastructure is to be located is unlikely to represent key habitat for otter. As a result of these factors the site has been assessed to be of local value for the species.

5.11.2.2 Bats

Within 50 m radius of the proposed wind energy project, no buildings or trees are found which would offer roost potential. Commuting and foraging resources are limited and low numbers of bats were recorded during surveys (Section 5.8 and Appendix D).

Open habitats occur abundantly over the area of the site where infrastructure is proposed to be located: around Turbine 1 at NS10066319, Turbine 2 at NS10066337 and Turbine 3 at NS10046354. These areas have recently been extensively cleared of scrub vegetation and present sub-optimal habitat for foraging and commuting bats. These sub-optimal characteristics include higher elevations, windy exposed topography, lower potential invertebrate prey abundance and limited vegetation edges with few linear features such as burns present which are preferred for echo-navigation. Bat activity was found to be lower in this immediate proposed development area and low numbers of bats were recorded during surveys.

The wider study area offers good roosting, commuting and foraging habitats for soprano pipistrelle bats which is likely to offer a locally important resource for this bat species. As a result of these factors the site has been assessed to be of value at a local geographic level only for the species.

5.11.2.3 Other Fauna

No or limited desk records or any evidence of presence was recorded during surveys of badgers, water voles, red squirrels and pine martens (Sections 5.6, 5.7, 5.9 and 5.10).

There is suitable habitat present to support these species, including Ascog Burn for water voles and woodland and scrub by Ascog Estate for badgers, pine martens and red squirrels. However, it is considered very unlikely the site is used by these protected species.

5.12 Predicted Impacts

5.12.1 Potential Impacts

Some of the impacts predicted as a result of the proposed Ascog Wind Energy Project can be considered generic impacts which are typically associated with a development of this nature. An ecology receptor may be affected by each of these generic impacts or just one. A summary description of these impacts is presented in Table 5.7. In addition, the presence of these impacts in the construction and/or operational phases of the proposed wind turbines are indicated.

It should be noted that the impacts associated with the operational phase of the wind energy project are considered to be permanent, whereas temporary impacts, which are only apparent while the turbine is being installed, arise during the construction phase.

Table 5.7: Potential Impacts on Ecological Interest of the Ascog Farm Wind Energy Turbine Project Proposal

Generic Impacts	Effects on Habitat Features/Species on Site	Construction Phase	Operational Phase
Direct habitat loss	The proposed wind farm will involve the construction of an access track, turbine bases and crane hardstandings, site compound and site control building within undeveloped habitats, resulting in direct habitat loss.	Yes	Yes
Damage and disturbance to habitats and species	The construction of the proposed development has the potential to cause temporary damage and disturbance to nearby habitats and species for the duration of the works, as a direct result of activities such as vehicle movements and noise.	Yes	Yes

Generic Impacts	Effects on Habitat Features/Species on Site	Construction Phase	Operational Phase
Hydrological damage	The construction of the wind farm has the potential to cause direct hydrological damage due to the excavation of the wind turbine bases and other infrastructure. This may then in turn have an indirect effect on adjacent habitats and/or dependent species.	Yes	Yes
Displacement of species	Both the construction and operation of the wind turbines have the potential to displace species, to varying levels. During construction, the impacts will be primarily terrestrial, causing habitat loss and deterring species from entering the area. During operation, the surrounding terrestrial habitats will be restored, however the operational wind turbines may displace bats and avian species.	Yes	Yes
Collision risk	The presence of the moving rotors of the wind turbines in operation may present a risk of collision to fauna flying over the area.	No	Yes
Dust deposition on sensitive habitats or sedimentation	During construction, the excavation works have the potential to cause additional dust deposition or sedimentation, which may affect sensitive habitats nearby (if any), depending on the direction of the prevailing winds.	Yes	No
Light pollution of habitats used by species	The construction of the wind farm may involve additional lighting such as around the site construction compound which could alter the behaviour of nocturnal species.	Yes	No

5.12.2 Potential Impacts on Habitats

The habitat receptors most likely to be potentially affected by the creation of the wind energy project relate to improved grassland, hedgerow and scrub. An account of the turbine and access track infrastructure footprint in relation to habitat receptors is presented in Appendix D.

Potential impacts of the construction and operational phases of the wind energy project is summarised in Table 5.8.

5.12.3 Potential Impacts on Habitat Receptors

5.12.3.1 Improved Grassland

This habitat is found where the access route and turbine infrastructure are proposed. All habitat loss and fragmentation both temporary and permanent would be associated with the improved grassland. This habitat has limited botanical or wildlife value and occurs abundantly over the site, locally, regionally and nationally. The impacts on this habitat are evaluated as non-significant.

5.12.3.2 Hedgerow and Scrub

Four crossings at field boundaries are anticipated to allow installation of the turbine access track (Appendix D – Target Notes 1 to 4). This habitat has some local wildlife value for nesting birds though none were recorded during the common bird census (see Chapter 6: Ornithology). Hedgerow and scrub occurs abundantly over the site, regionally and nationally. The impacts on this habitat are evaluated as non-significant and temporary.

5.12.3.3 Water Features – Lochs

There are no surface watercourses within the site. Loch Ascog is located 230 m to the west of the proposed development area (Appendix D, Target Note 5). This receptor has a very high sensitivity value as it is part of a nationally designated site, Central Lochs SSSI and is also a public water supply.

During construction activities, there is the potential for pollution events as a result of the uncontrolled use and storage of materials; the control of fuels, oils and chemicals on site would be managed through the development of a Construction Environmental Management

Plan. These controls would significantly reduce the risk of pollution events from the operation of plant and machinery on site and no significant environmental effects are predicted. Further details can be found in Chapter 10.

Standard best practice mitigation measures are to be undertaken to ensure likelihood of impact events upon this receptor result in non significant residual effects (Section 5.13.1).

5.12.3.4 Other Water Features – Ponds and Streams

Watercourses, namely Ascog Burn, field drainage issues and a pond occur within proximity of the proposed development area (Appendix D, Target Notes 6 and 7). This habitat has some local wildlife value and standard best practice measures should be observed to ensure likelihood of impact events upon this receptor are minimised.

5.12.3.5 Other Habitats

No felling of woodland is envisaged during construction activities. Other habitats including hay meadow semi-improved grassland, buildings, or those described in Section 5.4 and Appendix D are not anticipated to be significantly impacted. They are assessed as mainly occurring out with the immediate potential sensitive development construction and operation area and therefore there will be no temporary or permanent loss of these habitats.

Table 5.8: Potential Impacts of the Wind Energy Project upon Habitats

Receptor - Habitat or Species	Geographic Value of Receptor	Potential Impact	Impacts in the Absence of Mitigation						Significance and Justification
			Impact Magnitude of Change	Nature of Impact	Extent of Impact	Duration of Impact	Reversibility of Impact	Timing and frequency	
Improved Grassland	Very Low Very Local	Loss &/or fragmentation of habitat during and post construction of wind turbine infrastructure.	Low	Negative	Low	Long-term	Permanent	N/A	Very low - not significant. Project footprint: Access tracks and hardstanding 4,645 m ² ; electrical control room 40 m ² ; Turbine bases 538m ² . Locally, regionally and nationally commonly occurring agricultural habitat with limited botanical value. Included as an LBAP habitat for supporting notable species on certain sites only.
Hedgerow and Scrub	Very Low Very Local	Loss &/or fragmentation of habitat during and post construction of wind turbine infrastructure.	Low	Negative	Low	Long-term	Permanent	Low	Very low - not significant. Four field boundary crossings are anticipated to accommodate installation of 4 m wide access track at NS0993362883, NS1005563122, NS1006963365 and NS1004863537. Potentially 6 strips of intact and defunct hedge or scrub measuring 4 m each to be removed (24 m in total). Locally, regionally and nationally commonly occurring agricultural habitat. There is abundant like for like habitat in the immediate and wider area and loss or severance is unlikely to be significant for fauna which use this habitat such as birds, bats and small mammals.

Receptor - Habitat or Species	Geographic Value of Receptor	Potential Impact	Impacts in the Absence of Mitigation						Significance and Justification
			Impact Magnitude of Change	Nature of Impact	Extent of Impact	Duration of Impact	Reversibility of Impact	Timing and frequency	
Water Features: Lochs	Very High	Pollution of Loch Ascog SSSI during construction of associated structures, alteration of flow patterns and regimes.	Low	Negative	Low	Short term	Temporary	Low	Medium – significant. Any wind energy project has the potential to impact upon the quality of baseline water quality characteristics. As with any project of this nature the proposal will include mitigation measures for safeguarding against pollution incidents.
Other Water Features: Ponds and Streams	Medium	Alteration in water flow; alteration of flow patterns; pollution of water bodies during construction.	Low	Negative	Low	Short term	Temporary	Low	Low - not significant. The main water features that will potentially be affected by the proposals are the Ascog Burn at NS1025963958 and pond at NS1040363626. Pollution of other watercourse during the construction of the wind energy project resulting in the potential risk of sediment and soil entering drains and other small field drainage issues feeding into these water bodies. Best practices techniques (correct storage of materials, oils, diesel and sediment traps) should be employed during the construction of the wind energy project structures to minimise risk of pollution and sedimentation of Streams and ponds are included as LBAP habitat.

5.12.4 Potential Impacts on Protected Fauna

The faunal receptors most likely to be potentially affected by the creation of the wind energy project relate primarily to habitats utilised by key species (Section 5.11.1). An account of the turbine and access track infrastructure footprint in relation to notable species is presented in Section 5.5 relating to otters and Section 5.8 and Appendix D relating to bats.

Potential impacts of the construction and operational phases of the wind energy project on fauna is summarised in Table 5.11.

5.12.5 Potential Impacts on Otters

No evidence of otters, breeding holts or resting places was recorded within 30 m of the development area and therefore it is considered that the proposed development will not have a significant impact on these attributes on this species.

Evidence of wider territorial presence of otter was established at Loch Ascog which is likely to form part of a foraging area for prey items, likely fish species. Territorial sprainting was identified 377 m west of the nearest proposed turbine of NS100663371.

During construction activities, there is the potential for otters which may forage within proximity of the construction area to become trapped within any temporary structures such as ditches or pipes resulting in mortality or injury

Otters are a European Protected Species and therefore have a very high sensitivity value. The effect of any potential impact on this receptor is considered to be of low magnitude. It is therefore likely that the overall impact is likely to be of medium significance upon the receptor, based upon criteria outlined in Table 5.3. Standard best practice mitigation measures are to be undertaken to ensure likelihood of impact upon this receptor result in non significant residual effects (Section 5.13).

5.12.6 Potential Impacts on Bats

One species of bat, soprano pipistrelle, was recorded during surveys of the site at Ascog Farm. Bats occupy at least one building as a summer roost at residential dwellings at Ascog Estate at NS1047862973. The locations of the three proposed turbines are situated so that

they will be located well over 50 m of this ecologically important and legally protected feature. Turbine positions are also to be located to a minimum radius distance of 50 m from the identified primary commuting flight pathway routes and foraging habitat 1 at Loch Ascog and also the minor pathway (Appendix D)²³.

It was established that the bulk of bat activity occurs in the south site area and it was confirmed that soprano pipistrelle bats emerge from the building roost on Ascog Estate, commute and forage Loch Ascog and also along woodland edge to the east of site.

During the construction phase, it is expected that only minor vegetation clearance of boundary hedgerow and scattered scrub will occur (Appendix D). No significant vegetation clearance or tree felling is expected from the vicinity of turbine areas or during installation of access track. Habitat features in the immediate development area are considered sub-optimal for bats, being situated on an area of open and exposed hillside. There is ample optimal alternative commuting and foraging habitat for bats to use in the wider land holding boundary and also off-site. No loss or fragmentation of key commuting and foraging routes is anticipated as detailed in Appendix D.

It is considered that the development proposal will have no or limited effect on identified bat commuting or foraging habitats. The development proposal aims to maintain the ample bat habitat features present at Ascog, namely deciduous woodland, hedgerows, aquatic features on and offsite and also building structures which are currently used or provide potential use for roosting, commuting, foraging and feeding bats.

It is considered unlikely that bats will be temporarily significantly displaced or disturbed from commuting pathways or foraging areas during construction phase.

In terms of flight height band information, pipistrelles, being a small bat tend to be associated with cluttered habitat, flying low along these features. Bats recorded were found to be below collision risk band heights in the mean range of 0 to 20 m above ground elevation within the transacted areas including the immediate turbine areas. There were no calls detected during any surveys of any species considered to be at high risk from wind energy projects.

²³ As recommended in: Natural England Technical Information Note TIN059. (2009) Bats and Single large wind turbines & Natural England Technical Information Note TIN051. (2009) Bats and onshore wind turbines: Interim Guidance

Risk of turbine collision with bats is assessed at different levels and depends on several factors including the bat species, habitat preferences and flight behaviour. The Statutory Nature Conservation Organisation, Natural England (2009)²⁴ has produced guidance which is acknowledged by Scottish Natural Heritage and determines that pipistrelle bat species are at medium risk of turbine collision (Table 5.9). Natural England guidance also considers national and regional population size and distributions of pipistrelles and it is considered that the likelihood of threatening these attributes due to the impacts of wind turbines is low (Table 5.10).

Table 5.9: Bats as Individuals Likely to be at Risk from Wind Turbines (Natural England, 2009)

Low Risk	Medium Risk	High Risk
-	Soprano pipistrelle	-

Table 5.10: Populations Likely to be Threatened due to the Impacts from Wind Turbines (Natural England, 2009)

Low Risk	Medium Risk	High Risk
Soprano pipistrelle	-	-

The site design has followed best practice guidance (Natural England, 2009) and the turbines would not to be located within 50 m of any potential bat foraging habitat or highly suitable commuting habitat corridor. In addition, the proposed turbine project is to be located in excess of 473 m from the nearest known roost and 295 m away from the nearest potential bat building roost habitat at Ascog Farm. With the proposed turbine layout it is considered very unlikely that any impacts will occur on local bat populations.

Bats are a European Protected Species and this receptor has a very high sensitivity value. The effect of any potential impact on this receptor is considered to be of a low magnitude. The overall impact is assessed to be of medium significance upon the receptor based upon criteria outlined in Table 5.3. Therefore a precautionary approach implementing standard best practice mitigation measures are to be undertaken to ensure likelihood of impacts upon this receptor result in non-significant residual effects (Section 5.13).

²⁴ Guidance applicable at time of survey.

Overall, the assessment of likelihood of potential impacts on bats has been evaluated including risk of collision, break in commuting flight lines and fragmentation or loss of foraging habitat features present. Given consideration to local statutory site designations, review of desk study data, survey results and published guidance, no significant impact on soprano pipistrelle bat species recorded can be expected.

The assessment on bats has evaluated that preservation of the favourable conservation status of bats recorded; their roosts and habitats will be maintained within geographical context.

5.12.7 Potential Impacts on Other Notable Fauna

No or limited desk records or any evidence of presence was recorded during surveys of water voles, badgers, red squirrels and pine martens (Sections 5.6, 5.7, 5.9 and 5.10). No protected breeding or shelters were located on site and it is considered very unlikely the site is used by these notable species and therefore no significant impacts are anticipated.

5.12.8 Cumulative Impacts

There are no operational, consented or submitted wind energy development proposals within sufficient distance of the proposed Ascog Wind Energy Project to give rise to any significant cumulative effects. The impact of the proposed Ascog Wind Energy Project on the ecological value of the site is not anticipated to extend beyond the site boundary. None of the habitats or species present are anticipated to be affected by further wind energy developments or other developments in the immediate vicinity. No cumulative impact or effects on ecology are anticipated as a result of the Ascog Wind Energy Project.

Table 5.11: Potential Impacts of the Wind Energy Project upon notable Fauna Species

Receptor - Habitat or Species	Geographic Value of Receptor	Potential Impact	Impacts in the Absence of Mitigation						Significance and Justification
			Impact Magnitude of Change	Nature of Impact	Extent of Impact	Duration of Impact	Reversibility of Impact	Timing and Frequency	
Otters	Very High International	Mortality or injury due to construction activities.	Low	Negative	Low	Short-term	Temporary	Low	Medium – significant. European Protected Species. As detailed in Section 5.12.5.
Bats: Soprano Pipistrelle	High	Displacement or disturbance during construction activities.	Low	Negative	Low	Short-term	Temporary	Low	Medium – significant. European Protected Species. As detailed in Section 5.12.6.

5.13 Mitigation Measures

5.13.1 Mitigation Measures for Habitats

Any wind energy project has the potential to impact upon the quality of baseline water quality characteristics. As with a project of this nature, the proposal will include mitigation measures for safeguarding against pollution incidents (refer to Chapter 10 for hydrological assessment and proposed mitigation).

Standard best practice mitigation measures are to be undertaken to ensure likelihood of impact events upon Loch Ascog result in non-significant residual effects.

The following mitigation measures are proposed:

- Good construction site management will be implemented to minimise generation of litter, dust, noise and vibration. This will be controlled and monitored through the Construction Environmental Management Plan. Through adhering to best practices during construction and operation phases, fragmentation, disturbance and pollution to habitats present can be minimised²⁵;
- During construction, management of excavated soil will focus on preventing silt runoff into the water environment during rainfall periods through careful design and maintenance of drainage/silt traps; and
- Best practices techniques (correct storage of materials, oils, diesel and sediment traps) should be employed during the construction of the wind energy project structures to minimise risk of pollution and sedimentation of Loch Ascog.

5.13.2 Mitigation Measures for Otters

As otters are known to be in the general area and often forage widely and expand their territories the following mitigation is proposed:

- All contractors should be made aware of otters and their legal protection;
- All personnel are made aware that otters may exist close to the site and are at risk from vehicles;
- On site speed restrictions will be put into place for all vehicles, including construction, maintenance and visitors to the site;

²⁵ As recommended in: 'Good practice during wind farm construction'

- All trenches dug during construction and exposed open pipes will be covered at the end of each working day to ensure no risk to otters, or any other wildlife that may have the potential to be trapped; and
- Ramps will be located within the trenches or pits that can't be covered to allow an exit for any mammal that has gone into a trench or pit.

5.13.3 Mitigation Measures for Bats

A precautionary approach implementing standard best practice mitigation measures are to be undertaken to ensure likelihood of impacts upon this receptor result in non significant residual effects (Section 5.13).

During the construction phase, to ensure minimising disturbance or displacement of bats at present or future roosts, commuting or foraging bats to a minimum, the following mitigation is proposed:

- Preservation of existing, and planting of new hedgerows in order to encourage bats from the Ascog estate building roost at NS1046263041 to continue to commute and forage to the feeding area at Loch Ascog;
- Considering thoughtful landscaping including planting of hedgerow and trees from NS1005463079 to Loch Ascog at NS0973463115. This can enhance existing baseline attributes, increasing connectivity of habitat features and increase food availability and abundance for bats. This would entail planting hedgerow such as Hawthorn along a 320 m length (Appendix D). This will enhance foraging and feeding opportunities for bats and also provide additional value for other wildlife²⁶. This will also compensate for any hedgerow loss and fragmentation envisaged during installation of the turbine track;
- Aim to preserve and maintaining existing hedgerow vegetation between Ascog Farm to Loch Ascog;
- Bats should be encouraged to utilise existing habitat features through preservation of these features with the objective of attracting bat activity levels to a minimum of a 50 m radius outside of the proposed turbine locations; and
- Aim to maintain and enhance wider bat habitat connectivity out with the immediate proposed turbine development area at Ascog.

²⁶As recommended in: Entwistle, A. *et al.* (2001) Habitat management for bats: A guide for land managers, land owners and their advisors.

5.14 Significance of Residual Effects

Mitigation measures presented in Section 5.13 to ensure minimising potential risks of significant impacts upon one high value habitat receptor and two very high value fauna receptors have been recommended. It is predicted that as a result of implementing prescribed mitigation measures, non-significant residual effects on these receptors are expected. Table 5.12 provides a summary of residual receptor effects of the development.

Table 5.12: Ecological Receptor Residual Effects of Development

Receptor - Habitat or Species	Geographic Value of Receptor	Potential Impact	Impacts in the Absence of Mitigation						Mitigation Measures	Residual Effects	Confidence in Prediction
			Impact Magnitude of Change	Nature of Impact	Extent of Impact	Duration of Impact	Reversibility of Impact	Timing and Frequency			
Habitat: Water Features: Lochs	Very High	Pollution of Loch Ascog SSSI during construction of associated structures, alteration of flow patterns and regimes.	Low	Negative	Low	Short term	Temporary	Low	Best practice techniques in pollution control. As detailed Section 5.13.1.	Non- significant.	Certain.
Fauna: Otters	Very high International	Mortality or injury due to construction activities.	Low	Negative	Low	Short-term	Temporary	Low	Contractors briefed, best storage of materials. As detailed in Section 5.13.2.	Non- significant.	Certain.

Receptor - Habitat or Species	Geographic Value of Receptor	Potential Impact	Impacts in the Absence of Mitigation						Mitigation Measures	Residual Effects	Confidence in Prediction
			Impact Magnitude of Change	Nature of Impact	Extent of Impact	Duration of Impact	Reversibility of Impact	Timing and Frequency			
Fauna: Bats Soprano Pipistrelle	High	Displacement or disturbance during construction activities.	Low	Negative	Low	Short-term	Temporary	Low	Planting of hedgerow and trees from NS10054630 79 to Loch Ascog at NS09734631 15 to enhance existing baseline attributes, bat habitat features as detailed in Section 5.13.3.	Non- significant.	Certain.

5.15 Summary of Findings and Significant Effects

A desktop study and consultation was completed for the proposed Ascog Wind Energy Project in 2011. Survey work was completed between March 2011 and September 2011 including an extended Phase 1 Habitat Survey including notable protected fauna. A dedicated bat survey was also completed.

There are habitats of low conservation value within the turbine site development area and any habitat loss will be minimal and not significant. Loch Ascog SSSI is also likely to be unaffected by the construction of the wind energy project, as standard best practice mitigation measures to minimise potential pollution impacts are to be implemented.

There is current evidence of an active otter territory at Loch Ascog which is likely to be used as a feeding and foraging area. No evidence of the species was located within 30 m of the site development area and was assessed as providing low habitat value for foraging, resting and sheltering. Standard best practice mitigation measures to minimise potential impacts are to be implemented.

One species of bat, soprano pipistrelle, was found on site during surveys. The site design has followed best practice guidance (Natural England, 2009) and the turbines would not be located within 50 m of any potential bat foraging habitat or highly suitable commuting habitat corridor. In addition, the proposed wind energy project is to be located in excess of 473 m from the nearest known roost and 295 m away from the nearest potential bat building roost habitat at Ascog Farm. With the proposed turbine layout it is considered very unlikely that any impacts will occur on local bat populations. Standard best practice mitigation measures to minimise potential impacts are to be implemented. As a result no significant impact on the local bat population is expected.

Based on the results of the desktop study, consultation and the completed habitat and fauna surveys, no significant effects are expected for the ecological receptors using the site.

Overall the development is not expected to have a significant effect on any ecological components; however, mitigation measures to ensure this have been outlined within this assessment Chapter.

6 ORNITHOLOGY

6.1 Introduction

This Chapter addresses potential impacts of the development on the ornithological interest of the site. Wind turbines are known to have the potential to affect bird populations through the risk of collision with flying birds, disturbance of breeding and feeding birds during construction and through displacement of breeding or feeding birds during the operational lifetime of the development.

Due to the proximity of the site to the Central Lochs, Bute SSSI which is designated for its internationally important concentration of non-breeding Icelandic Greylag Geese (*Anser anser*), particular attention was paid to potential impacts on this site and there was ongoing liaison with Scottish Natural Heritage (SNH) during the course of winter survey work to ensure that the survey approach was to their satisfaction.

6.2 Approach

6.2.1 Scope and Consultation

The scope of the ornithology surveys was derived through consultation with SNH. An ornithological desk-based survey was carried out in March 2011. This was used to supplement the EIA Scoping Opinion, received from Argyll and Bute Council and SNH in November and December 2010 respectively, in order to scope out the sensitive habitats and species, and to put forward an appropriate framework for survey work (see Appendix B for details of consultation).

SNH responded in April 2011 confirming that the extent of survey work proposed is appropriate to the scale of the development and the ecological sensitivity of the site. The following ornithology surveys were agreed:

- Goose surveys – 12 hours of vantage point (VP) surveys in April 2011 (following 36 hours of winter VP surveys); and
- Breeding bird survey – Common Bird Census (CBC) in April, May and June 2011; and

- Summer Vantage point (VP) watches – two VP surveys (6 hours per VP per month, April to September 2011).

It was also proposed that should the number of geese monitored in the April 2011 VP surveys be similar to, or less than, the wintering geese numbers, that goose monitoring be terminated at that point. SNH noted that they would be consulted again following the April 2011 VP goose studies.

SNH were consulted further in May 2011 following the April 2011 goose surveys. They were informed that at the time of the final visit all geese had left the site except for a small group of 22. It was therefore proposed that the goose survey effort be suspended and that any assessment would be carried out on the data gathered up to that point. SNH responded in May 2011 and noted that they considered this approach satisfactory.

6.2.1.1 Desk-based Survey

A desk-based survey of existing information was been undertaken for the site at Ascog Farm. Bird survey data existed for the site in previous years and the following sources were consulted in order to establish what species have been sighted in the area:

- NBN;
- SNH;
- British Trust for Ornithology (BTO);
- Bird Atlas (BA);
- Bute Bird Group (BBG); and
- SAC goose survey – other bird observations (SAC).

6.2.1.2 Vantage Point Surveys

Vantage point surveys were used to monitor the activity of flying birds within 500 m of the proposed turbines to assess the potential collision risk that might exist following construction. The focus of the vantage point surveys was the overwintering population of Icelandic Greylag Geese that forms the qualifying interest of the Central Lochs, Bute SSSI. However, other species that are considered to be at risk of wind turbine collision are known to occur on Bute and were also treated as target species for vantage point surveys. These included divers, swans, other goose species, ducks, and Schedule 1 raptors, such as Hen Harrier, Merlin, Peregrine and White-tailed Eagle.

Between October 2010 and April 2011, 48 hours of observation was carried out from a single vantage point to the west of the site (NS096636) that allowed movements of geese between their roosting site on Loch Ascog and the surrounding land (including the Hill of Ascog) to be monitored (Table 6.1). This site had limited visibility of the area to the east of the proposed turbines but it was considered that any significant movements of wildfowl into and out of this area would have been detected from the location that was used. In addition, the location and size of feeding flocks of geese was recorded before or after each survey period to highlight the main areas used by feeding geese. In accordance with the published guidance on overwintering wildfowl (SNH, 2005 revised in 2010), 36 hours of observation were carried out between October and March concentrating on early morning and late afternoon and evening when goose flight activity is generally greatest. Two three hour visits per month were planned, but the November survey visits were cancelled due to the unusually early and severe snowfalls, with these being replaced by additional visits in March. An additional 12 hours of observation took place during April to determine whether there was any evidence of an increase in goose activity associated with the spring migration period.

Table 6.1: Schedule of Winter Vantage Point Survey Visits

Visit	Date	Start Time	Finish Time
1	28/10/2010	14:45	17:45
2	29/10/2010	08:10	11:10
3	15/12/2010	09:00	12:00
4	15/12/2010	13:00	16:00
5	30/01/2011	08:45	11:45
6	30/01/2011	14:00	17:00
7	15/02/2011	14:45	17:45
8	16/02/2011	07:45	10:45
9	13/03/2011	15:45	18:45
10	14/03/2011	07:45	10:45
11	27/03/2011	16:50	19:50
12	28/03/2011	07:45	10:45
13	07/04/2011	16:35	19:35
14	08/04/2011	07:40	10:40
15	21/04/2011	17:30	20:30
16	21/04/2011	07:40	10:40

Over the following summer, between May and September 2011, the full range of target species was assessed from two vantage points, one to the south of the site (VP 1:

NS096624) and one to the north (VP 2: NS097639). From each point, 36 hours of observation was undertaken covering all daylight hours (Table 6.2).

Table 6.2: Schedule of Summer Vantage Point Survey Visits

Vantage Point	Date	Start Time	Finish Time
VP2	10/05/2011	13.55	16.55
VP1	10/05/2011	17.55	20.55
VP2	11/05/2011	08.45	11.45
VP1	11/05/2011	12.45	15.45
VP1	20/05/2011	09.30	12.30
VP2	20/05/2011	13.30	16.30
VP1	31/05/2011	10.10	13.10
VP2	31/05/2011	14.10	17.10
VP2	09/06/2011	06.15	09.15
VP1	09/06/2011	12.05	15.05
VP1	29/06/2011	12.25	15.25
VP2	29/06/2011	12.25	15.25
VP1	16/07/2011	05.45	08.45
VP2	16/07/2011	09.45	12.45
VP2	26/07/2011	14.00	17.00
VP1	26/07/2011	14.00	17.00
VP2	16/08/2011	06.05	09.05
VP1	16/08/2011	10.05	13.05
VP2	31/08/2011	16.00	19.00
VP1	31/08/2011	16.00	19.00
VP1	13/09/2011	08.45	11.45
VP2	13/09/2011	12.45	15.45
VP2	29/09/2011	10.50	13.50
VP1	29/09/2011	14.50	17.50

6.2.1.3 Breeding Birds

The breeding bird survey allows an assessment of breeding birds to be made: those that may be at risk of displacement following construction of the turbines or disturbance during construction of the turbines and associated infrastructure. In accordance with published guidance (SNH, 2005 revised in 2010) birds were recorded using a modification of the Common Bird Census methodology (Gilbert et al., 1998) in an area extending 500 m from

the proposed turbines and associated infrastructure (roads etc.). This requires the observer to walk steadily throughout the survey area, ensuring that all parts of the survey area are approached to within 50 m (30 m for field boundaries, recording all birds seen or heard. Three early morning survey visits took place on 18 April, 21 May and 29 June 2011.

6.2.2 Policy, Regulations and Guidance Context

The ornithology assessment completed in this Chapter is considered in the context of relevant legislation and policy guidance described below:

- Directive 2009/147/EC on the conservation of wild birds (the Birds Directive);
- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive);
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
- The Wildlife and Countryside Act 1981, as amended;
- Nature Conservation (Scotland) Act 2004;
- Scottish Planning Policy (2010): Landscape and Natural Heritage – this sets out Scottish Government Guidance on how government policies for the conservation and enhancement of Scotland's natural heritage should be reflected in land use planning;
- Scottish Planning Policy PAN 60: Planning for Natural Heritage 2000;
- The UK Biodiversity Action Plan;
- Argyll and Bute Council Local Biodiversity Action Plan;
- The Scottish Biodiversity List: Section 2 (4) Nature Conservation (Scotland) Act 2004;
- Survey methods for use in the assessment of proposed onshore wind farms on bird communities (SNH, 2005 revised in 2010); and
- Assessing significance of impacts from onshore wind farms on birds outwith designated areas (SNH, 2006).

6.2.3 Impact Assessment

For operational impacts, which are typically permanent or long-term, a significance matrix approach combines information about the sensitivity of the receptor with the potential magnitude of any impacts to determine the significance of any impacts and therefore the need for mitigation. An example of sensitivity levels for birds is shown in Table 6.3, with magnitudes of impact shown in Table 6.4 and the significance matrix in Table 6.5. The magnitude of any impacts is likely to vary between different types of birds as studies have shown that some bird groups (e.g. wildfowl, waders and raptors) are more vulnerable to

impacts from wind turbines than others (e.g. passerines [songbirds]) (Stewart, Pullin and Coles, 2004; Hötter et al., 2006).

Table 6.3: Examples of Different Sensitivity Levels for Birds

Sensitivity	
Very High	E.g. Species that form the cited interest of Special Protection Areas (SPAs) or other statutory conservation designations.
High	e.g. Other species occurring on Annex 1 of the EC Birds Directive or Schedule 1 of the Wildlife & Countryside Act 1981.
Medium	E.g. Red-listed Birds of Conservation Concern (Eaton et al. 2009).
Low	E.g. Amber-listed Birds of Conservation Concern (Eaton et al. 2009).
Very Low	E.g. Birds that are not of Conservation Concern (Eaton et al. 2009).

Table 6.4: Examples of Different Magnitude Levels of Impacts

Magnitude	
Very High	Total loss or major alteration to the baseline (pre-development) conditions (e.g. <20% remaining).
High	Major loss or alteration to baseline conditions meaning they will be fundamentally changed (e.g. 20-80% loss).
Medium	Loss or alteration to one or more key features of the baseline conditions, resulting in partial change (e.g. 5-20% loss).
Low	Minor shift from baseline conditions. Change will be discernible but underlying character of baseline condition will remain (e.g. 1-5% loss).
Negligible	Very slight change from baseline condition. Change barely distinguishable (e.g. <1% loss).

Table 6.5: Sensitivity of Species Significance Matrix

		Impact				
		Very High	High	Medium	Low	Very Low
Magnitude	Very High	Very High	Very High	High	Medium	Low
	High	Very High	Very High	Medium	Low	Very Low
	Medium	Very High	High	Low	Very Low	Very Low
	Low	Medium	Low	Low	Very Low	Very Low
	Negligible	Low	Very Low	Very Low	Very Low	Very Low

For construction impacts, which are typically temporary and short-term, the impact assessment focuses on direct disturbance of receptors such as breeding Schedule 1 birds,

in order to determine whether any aspect of construction would require a licence under the relevant legislation or if mitigation can avoid this requirement.

6.3 Baseline Conditions

6.3.1 Geese

The proposed turbines lie 300 m to the north-east of Loch Ascog, which forms part of the Central Lochs, Bute SSSI. The SSSI comprises six lochs on the island and is designated for the internationally important numbers of Icelandic Greylag Geese that use the lochs as winter roost sites. Although Greylag Geese are not themselves specially protected (and can indeed be shot between 1 September and 31 January), their status as the qualifying feature of the SSSI makes them a very high sensitivity receptor in relation to the proposed development (Table 6.3). In recent years up to 1800 Greylag Geese (c.1.5% of the biogeographical population) have overwintered on the island²⁷.

Details of the total numbers of Greylag Geese observed on Loch Ascog and feeding in the surrounding fields on each survey visit during winter 2010 to 2011 are shown in Table 6.6. This shows that goose numbers were low in October and late April and highest in December and early January. The fields where goose feeding activity was observed are shown on Figure 6.1 in Appendix E along with the flight-lines of flying geese observed during the course of the vantage point survey. Most goose activity took place to the south-west of the survey area in the immediate vicinity of the loch. During a total of 48 hours observation, 1,556 Greylag Geese were recorded flying within 500 m of the proposed turbine (mostly associated with feeding flocks close to the Loch), but only two flocks, totalling 23 geese flew within 250 m of the turbines (eight on 16 February and 15 on 14 March).

²⁷ Mitchell 2011

Table 6.6: Total Count of Greylag Geese observed in the Loch Ascog Area on each Winter Vantage Point Survey Date

Visit	Date	Total Goose Numbers in Loch Ascog Area*
1	28/10/2010	20
2	29/10/2010	10
3	15/12/2010	1,160
4	15/12/2010	780
5	30/01/2011	805
6	30/01/2011	130
7	15/02/2011	191
8	16/02/2011	250
9	13/03/2011	136
10	14/03/2011	260
11	27/03/2011	370
12	28/03/2011	408
13	07/04/2011	275
14	08/04/2011	460
15	21/04/2011	22
16	21/04/2011	22

* Includes geese that were more than 500 m from the proposed turbines.

In addition to Greylag geese, feral Canada Geese (*Branta canadensis*) were present on several visits, mainly on the west side of Loch Ascog at Windyhall, with over 400 present on 15 December 2010. Up to 8 Barnacle Geese (*Branta leucopsis*) were observed within the Greylag flocks around the loch throughout the winter and a single Pink-footed Goose (*Anser brachyrhynchus*) was present on 15 December 2010. No Greenland White-Fronted Geese (*Anser albifrons flavirostris*) were observed during fieldwork, although a flock of around 200 birds overwinters on the Isle of Bute, primarily in the Dhu Loch area (4km to the south-west of Ascog).

Greylag Geese were also present in the area throughout the summer vantage point surveys with 62 present on Loch Ascog on 31 May 2011 and 240 present on the loch on 26 July 2011. These are likely to belong to the re-established resident population of Greylag Geese rather than the Icelandic population for which the SSSI is designated. A total of 49 Greylag Geese were recorded flying within 500 m of the proposed turbines during the 72 hours of

summer vantage point surveys, but only 15 of these were within 250 m of the proposed turbines.

6.3.2 Other Non-breeding Target Species

Among the target species groups recorded during the vantage point survey (divers, swans, geese, ducks, schedule 1 raptors), eleven species that are red or amber listed species of conservation concern were observed within 500 m of the proposed turbines over the winter and summer vantage point survey visits (Table 6.7). However, most of these were seen feeding on or around Loch Ascog and only three species were recorded flying at potential collision height within the survey area: two flocks of 15 and 30 Lapwings were recorded flying over fields adjacent to the southern-most turbine site on 15 December 2010; two Mallards flew across the survey area on 7 April 2011 and again on 10 May 2011 and three Oystercatchers flew through the survey area on 31 May 2011.

In addition to the target species groups, a flock of about 250 Herring Gulls (red-listed species of conservation concern) was present within the survey area on 15 February 2011 but below turbine height at the covered reservoir north of Loch Ascog. This was the only large flock of birds other than geese recorded. Smaller numbers of Herring gulls were also present on many of the summer survey visits.

Apart from the species already mentioned, the only other Schedule 1 species recorded during any of the bird surveys was Common Crossbill (*Loxia curvirostra*) which was recorded flying over on 26 July 2011.

Table 6.7: Non-breeding Target Species Recorded during Winter and Summer Vantage Point Surveys

Common Name	Scientific Name	Status	Winter Survey	Summer Survey	Flying at Potential Collision Risk Height
Whooper Swan	<i>Cygnus cygnus</i>	Annex 1/Schedule 1/Amber list	✓		
Shelduck	<i>Tadorna tadorna</i>	Amber list		✓	
Wigeon	<i>Anas Penelope</i>	Amber list	✓		
Mallard	<i>Anas platyrhynchos</i>	Amber list	✓	✓	✓
Tufted Duck	<i>Aythya fuligula</i>	Amber list	✓		
Goldeneye	<i>Bucephala clangula</i>	Schedule 1/Amber list	✓		
Kestrel	<i>Falco tinnunculus</i>	Amber list		✓	
Oystercatcher	<i>Haematopus ostralegus</i>	Amber list	✓	✓	✓
Lapwing	<i>Vanellus vanellus</i>	Red list	✓		✓
Curlew	<i>Numenius arquata</i>	Amber list	✓	✓	
Redshank	<i>Tringa totanus</i>	Amber list	✓		

6.3.3 Breeding Birds

A total of 51 bird species were recorded within 500 m of the proposed development during the three breeding bird survey visits (see Appendix E), although this included a number of species that were flying over or feeding within the survey area but not necessarily breeding.

No Schedule 1 species were breeding within 500 m of the site, but six red-listed birds of conservation concern showed evidence of breeding within the survey area (Table 6.8), all of which were passerines (songbirds) and all of which were 200 m or more from the proposed development (Figures 6.2 to 6.4 in Appendix E). These species could be considered as medium sensitivity receptors. One pair of Buzzards was the only species of raptor found to be breeding within the survey area (approximately 400 m north-east of the development) but this is not a species of conservation concern. Small numbers of Oystercatchers and one Curlew were found around the shores of Loch Ascog, but there was no confirmed evidence of these wader species breeding within the survey area.

Table 6.8: UK BAP Priority Species Breeding within 500 m of the Proposed Development

Common Name	Scientific Name	
House Sparrow	<i>Passer domesticus</i>	c.20 pairs at 9 locations around buildings within the surveyed area
Tree Sparrow	<i>Passer montanus</i>	1 pair near Mid Ascog at the southern end of survey area
Skylark	<i>Alauda arvensis</i>	1 singing male over field near Loch Ascog
Starling	<i>Sturnus vulgaris</i>	Singing bird at Ascog farm, with feeding birds in fields throughout survey area
Yellowhammer	<i>Emberiza citrinella</i>	1 singing male at sewage works
Linnet	<i>Carduelis cannabina</i>	1 to 2 individuals flying and calling over scrub at the southern end of survey area.

In the immediate vicinity (within 100 m) of the proposed development, where there is the greatest risk of short term disturbance from the construction work, the only species showing evidence of breeding were relatively common passerine species: Willow Warbler *Phylloscopus trochilus*, Wren Troglodytes *troglodytes*, Blackbird *Turdus merula*, Wheatear *Oenanthe oenanthe*, Dunnock *Prunella modularis*, Pied Wagtail *Motacilla alba*, Meadow Pipit *Anthus pratensis*, Chaffinch *Fringilla coelebs*, Goldfinch *Carduelis carduelis*.

6.4 Predicted Impacts

6.4.1 Short Term Impacts

Although the species breeding in close proximity (less than 100 m) to the proposed turbines and access road are relatively common, there is the potential for their nests to be destroyed during the construction process depending on the timing of operations, particularly if any scrub or tree removal is required to facilitate access. Destruction of the nests of any of these species would be an offence under the Wildlife and Countryside Act 1981, whether intentional or reckless.

As there are no Schedule 1 species breeding within 500 m of the proposed development, there are no issues regarding the disturbance of those species during construction.

6.4.2 Long Term Impacts

6.4.3 Geese

Only 38 Greylag Geese were recorded flying within 250 m of the proposed turbines during a total of 120 hours of year-round vantage point surveys, and only 23 of these were thought to relate to the wintering Icelandic population for which the Central Lochs are designated. Such a low level of flight activity results in a collision risk for overwintering geese of negligible magnitude (0.128 collisions per annum – see collision risk assessment in Appendix E), and thus a low significant overall impact for the SSSI.

Although several hundred Greylag Geese regularly feed in fields on the east side of Loch Ascog during the winter, no geese were recorded feeding closer than 300 to 400 m from the proposed turbines, which is the distance by which feeding geese typically avoid wind turbines according to studies reviewed by Hötter et al. (2006). There is therefore unlikely to be a significant risk of displacement from feeding areas that could affect the integrity of the SSSI.

6.4.4 Other Non-breeding Species

A total of 45 Lapwings, 4 Mallards and 3 Oystercatchers were recorded flying at potential collision height within 500 m of the proposed turbines during 120 hours of year-round vantage point surveys. As amber and red listed species of conservation concern these can be considered as low or medium sensitivity receptors, and with relatively low numbers recorded for the amount of survey effort, any potential collision risk is likely to be negligible or low, resulting in low or very low significance impacts on these species within the survey area.

No higher sensitivity species were recorded at potential collision risk height during the vantage point surveys.

6.4.5 Breeding Birds

Concerns about long term impacts on breeding birds centre on the risk of bird territories being displaced by the presence of the operational turbines. Raptors and wading birds may show displacement effects up to 200 to 500 m from operational turbines, or even further in some cases, but passerines rarely show displacement distances greater than 200 m and

usually no more than 100 m (Hötter et al. 2006; Pearce-Higgins et al. 2009). As no high or very high sensitivity species were breeding within 500 m of the site and all of the medium sensitivity species were passerines breeding more than 200 m away, any potential displacement of breeding birds at the site is likely to be a low or very low significance impact. An example of this would be the displacement of the Buzzard pair nesting at the northern edge of the survey area, although this is by no means certain to occur as it is close to the 500 m displacement distance recorded for this species.

6.4.6 Cumulative Impacts

SNH Guidance (2005 revised in 2010) states that *‘where there are already existing wind farms in the locality, or others proposed, then it may be necessary to consider the potential cumulative effect of the proposed wind farm’*. Observations during the survey fieldwork suggest that most goose feeding takes place in close proximity to the roosting loch and it is therefore unlikely that geese feed on the adjacent mainland to any significant extent while they are roosting on the Bute Lochs. In the absence of any other operational, consented or submitted large-scale wind energy development proposals on Bute it is considered that there are unlikely to be any significant cumulative effects on ornithology as a result of the Ascog Wind Energy Project.

6.5 Mitigation Measures

With no very high, high or medium significance impacts predicted, there are relatively few issues raised by the ornithological surveys that require mitigation. The main mitigation required is to avoid the destruction of birds’ nests during construction. This would be achieved by ensuring that any scrub or tree removal required to facilitate construction of the turbine bases and associated infrastructure (roads and grid connections) would be carried out outside the bird nesting season (i.e. avoiding the period between March and August inclusive). If construction takes place on open ground habitats during the nesting period, the site would be checked for the presence of ground-nesting species such as Meadow Pipit and work would be scheduled to avoid any nests found.

6.6 Significant Residual Effects

With the mitigation measures outlined in Section 6.5, any residual effects of the development are likely to be of low or very low significance.

6.7 Summary of Findings and Significant Effects

The proposed turbines lie 300 m to the north-east of Loch Ascog, which forms part of the Central Lochs, Bute SSSI, designated for internationally important numbers of wintering Icelandic Greylag Geese.

Up to 1,160 Greylag Geese were present on and around Loch Ascog at any one time between October 2010 and early April 2011, with most feeding and flight activity in the immediate vicinity of the loch. Only 23 geese were observed flying within 250 m of the proposed turbines during 48 hours of observation between October 2010 and April 2011.

In addition to the geese, very small numbers of low and medium sensitivity non-breeding species were recorded flying over the site during winter and summer vantage point surveys with no Schedule 1 species flying at potential collision risk height.

No Schedule 1 species were breeding within 500 m of the proposed turbines or associated infrastructure, with six UK BAP priority species (all of them songbirds) being the highest sensitivity breeding species present. None of these were closer than 200 m to the proposed turbines.

With such low numbers of a low range of high or very high sensitivity species, any potential collision risk or displacement impacts on birds at this site are likely to be of low or very low significance.

The risk of nest destruction during the construction phase of the development would be mitigated by the timing of operations such as scrub or tree removal, to ensure compliance with the Wildlife and Countryside Act 1981.

7 LANDSCAPE AND VISUAL ASSESSMENT

7.1 Introduction

This Chapter has been produced by Chartered Landscape Architects at AMEC Environment and Infrastructure UK Limited.

The Landscape and Visual Impact Assessment (LVIA) for wind farms forms one of the key components of the EIA process to comply with the Environmental Impact Assessment (Scotland) Regulations (as relevant and amended and hereinafter referred to as the 'EIA Regulations'), and allows consideration of the proposed development against the relevant local planning policies, for the protection of the landscape resource and visual amenity.

The objective of this assessment has been to determine the landscape and visual effects of the proposed development, Ascog Wind Energy Project, on the existing landscape resource and visual amenity. The following landscape and visual receptors have been assessed:

- Landscape character, key characteristics and elements;
- Designated landscapes; and
- Views and visual amenity experienced by residents, tourists, visitors, recreational and road users.

The assessment process has encompassed the construction, operation, and decommissioning phases of the proposed Ascog Wind Energy Project and has included design iteration and re-assessment of the residual effects. The process has sought to achieve an acceptable compromise between maximising energy capture and achieving an acceptable design in terms of landscape and visual effects.

7.1.1 Chapter Structure

The Chapter is structured as follows:

- Section 7.2 Approach;
- Section 7.3 Baseline Conditions;
- Section 7.4 ZTV and Viewpoint Analysis;
- Section 7.5 Mitigation Measures;
- Section 7.6 Predicted Impacts: Landscape Effects;

- Section 7.7 Predicted Impacts: Visual Effects;
- Section 7.8 Summary of Residual Landscape and Visual Effects;
- Section 7.9 Summary of Significant Effects and Conclusions; and
- Appendix F: LVIA Methodology, LVIA Glossary, ZTV and Viewpoint Analysis and LVIA Graphics.

7.2 Approach

7.2.1 Scope and Consultation

Scoping Opinion and responses were sent on 15 December 2010 (received on 16 December 2010) and sent by Argyll and Bute Council on 21 January 2011.

Consultation regarding the scope of the landscape and visual assessment and in particular, viewpoint selection was carried out with Scottish Natural Heritage (SNH) throughout 2011. The consultees were provided with a list of proposed viewpoints and the reason for the viewpoint's selection. SNH requested additional baseline information (including figures illustrating the Cumulative Baseplan, Landscape Planning Designations, Recreation Routes and Tourist Destinations all covering a greater study area and overlaid with the proposed project's ZTV), and proposed the study of past relevant wind farm scheme Landscape and Visual Impact Assessment's selected viewpoints. Following several communications, SNH agreed with the selected viewpoints and proposed some additional viewpoint locations (e.g. Strone Point, Kelburn Estate and Goat Fell).

A scope of the assessment is set out in Table 7.1 and the viewpoint selection process is set out in Table 7.2.

Consultation and research of local authority planning application databases was also carried out in relation to cumulative wind energy development within the 70 km search area. A summary of wind energy development, within the search area, and whether or not this has been included in the Cumulative Landscape and Visual Impact Assessment (CLVIA) is provided in Table 7.3 and Table 7.4.

Table 7.1: Scope of the Landscape and Visual Assessment

Landscape Issues	Description
Landscape Character	The effects of the proposed development on the landscape character and quality of the site area, as defined by the landscape character assessments relevant to the study area.
Landscape Elements	Direct or physical effects on landscape elements, which may include forestry, moorland and grassland and the existing access.
Landscape Designations	Indirect effects on those designations that lie within the ZTV, including the North Arran, Kyles of Bute and Loch Lomond National Scenic Areas, Loch Lomond and The Trossachs National Park (NP), Clyde Muirshiel and Loch Lomond Regional Park, Renfrewshire Hills Scenic Area, North Ayrshire Sensitive Landscape Area, Argyll and Bute Area of Panoramic Quality, Wild Land Search Areas, as perceived by peoples.
Visual Issues	Description
Local Community	Views from the local rural community, particularly from residential properties near the site and from local settlements which lie within the ZTV.
Recreation Routes and Tourist Destinations	Views from popular outdoor recreation routes including the National Cycle Routes, West Island Way Long Distance Routes amongst others, and tourist destinations such as at Mount Stuart Historic Gardens and Designed Landscapes and Rothesay Conservation Areas, which entail an appreciation of the landscape and the setting of its features within the visitor experience.
Major Transport	Transport routes (including tourist routes) considered in the assessment include the A844, A815 and A78.
Cumulative Assessment	The cumulative assessment includes viewpoint assessment within the study area where simultaneous and/or successive views of more than one wind farm may be achieved, and sequential cumulative assessment, where more than one wind farm may be viewed along transport routes (simultaneous or successive).

7.2.1.1 Viewpoint Selection

All requests for additional or alternative viewpoint locations were considered through the viewpoint analysis and site observation process, which was undertaken over the course of August to November 2011. As far as possible, viewpoints have been selected to represent the proposed development at its most visible, as experienced by a range of receptor groups, from a spread of different directions, and over varying distances.

A summary of the viewpoints considered as part of the assessment, and the reason for their selection is provided in Table 7.2. Each of these locations (with the exception of Goat Fell due to weather conditions) were visited as part of the assessment process (which included the preparation of wireframes) and those selected for illustration are numbered and shown in bold. In total 21 viewpoints agreed through consultation, have been illustrated in Figures 7.13a/b to 7.35a/b, and the viewpoint locations are illustrated in Figure 7.2 and 7.3. (Viewpoints are listed in order based upon their increasing distance from the proposed development).

A summary of the viewpoint analysis is provided in Appendix F.

Table 7.2: Viewpoint Selection Process

Viewpoint	Reason for Selection/Illustration or Exclusion	Distance (m)
1) Common Hill (locally known as Canada Hill), Isle of Bute	Nearby vantage point to the north of the proposed site (east of Rothesay settlement) representative of views experienced by recreational receptors.	804
2) Mount Stuart, Isle of Bute	Requested by SNH. This Garden and Designed Landscape is a tourist attraction located to the south of Ascog Wind Energy Project. Viewpoint location is representative of views experienced by visitors.	2,273
3) Rothesay, Isle of Bute	Nearby settlement located to the north west of the proposal site, illustrating views experienced by local residents.	2,051
4) Toward Quay, Southern point of Cowal Peninsula	Viewpoint located within Argyll and Bute Area of Panoramic Quality. Views experienced by residential and recreational receptors (walkers of Long Distance Route Five Degrees West Challenge and kayakers) and visitors to the nearby castle.	4,367
5) Southerly Point on B881, Isle of Bute	SNH requested viewpoint location travelling north up the B881. Views experienced by road users and residential receptors.8164	5,060
6) Bell Bay, Great Cumbrae Island	Viewpoint location requested by SNH within North Ayrshire Sensitive Landscape Area and experienced by recreational receptors.	8,164
7) Strone Point, Kyles of Bute	Viewpoint location requested by SNH is within Kyles of Bute NSA. Views experienced by residential and	9,033

Viewpoint	Reason for Selection/Illustration or Exclusion	Distance (m)
	road user receptors.	
8) A78, Knock Castle	Viewpoint location selected along A78 road to be representative of views experienced by users of the road and the nearby tourist attraction and Historic Scotland visitor site. Located within North Ayrshire Sensitive Landscape Area and the Clyde Muirshiel Regional Park.	9,065
9) Vantage Point at Glaid Stone, Great Cumbrae Island	Requested by SNH. Viewpoint within North Ayrshire Sensitive Landscape Area experienced by recreational receptors. Located to the south east of the proposed site. Cumulative viewpoint.	9,131
10) Wemyss Bay to Rothesay Ferry Route	Viewpoint location selected along the ferry route to overlap with sailing routes and, in general as requested by SNH, representative of Skelmorlie settlement. Views experienced by ferry users, recreational and residential receptors.	9,201
11) Largs	Viewpoint location selected at settlement and along Long Distance Route Ayrshire Coastal Path. Representative of views experienced by residential and recreational receptors.	10,724
12) Inverchaolain, East Coast of Loch Striven	Viewpoint location requested by SNH within Argyll and Bute Area of Panoramic Quality. Representative of views experienced by residential receptors.	11,745
13) Kelburn Estate, South of Largs	Viewpoint requested by SNH. This Gardens and Designed Landscape is a tourist attraction located to the south east of Ascog Wind Energy Project. Viewpoint location is representative of views experienced by visitors.	13,645
14) Lunderston Bay Picnic Spot, North of Inverkip	Viewpoint location requested by SNH within Ardgowan Garden and Designed Landscape and Clyde Muirshiel Regional Park, and experienced by recreational receptors.	15,140
15) Greenock Cut, West of Dunrod Hill.	Viewpoint location requested by SNH within Clyde Muirshiel Regional Park, and experienced by recreational receptors.	16,127

Viewpoint	Reason for Selection/Illustration or Exclusion	Distance (m)
16) Farland Head, West Coast near Portencross	Viewpoint location requested by SNH as a popular picnic spot. Representative of views experienced by recreational receptors.	16,307
17) Gourouck Hunterston Quay Ferry Route	Viewpoint location requested by SNH. Representative of views experienced by ferry user and recreational (sailors) receptors.	17,655
18) Cock of Arran, Arran	Viewpoint requested by SNH located to the south west of the proposed site within North Arran NSA & North Ayrshire Sensitive Landscape Area. Views experienced by recreational receptors.	17,921
19) Corrie village, Arran	Viewpoint location requested by SNH is within North Arran NSA & North Ayrshire Sensitive Landscape Area. Settlement to the south west, representative of views experienced by residents and road users on the A841.	21,281
20) Kilcreggan, Roseneath Peninsula	Viewpoint location requested by SNH. Representative of views experienced by residential and B833 road user receptors.	21,338
21) Goat Fell Summit, Arran	Requested by SNH. Viewpoint within North Arran NSA, Wild Land Search Area & North Ayrshire Sensitive Landscape Area, experienced by recreational receptors. Located to the south west of the proposed Ascog Wind Energy Project. Cumulative viewpoint.	24,230
Other Viewpoints Considered		
Rothsay Castle	Viewpoint considered and assessed initially, but not illustrated in favour of more relevant viewpoints selected through consultation with SNH.	
A844 by Scalpsie	Viewpoint considered and assessed initially, but not illustrated in favour of more relevant viewpoints selected through consultation with SNH.	
West Island Way by White Port	Viewpoint considered and assessed initially, but not illustrated in favour of more relevant viewpoints selected through consultation with SNH.	
Balmory House	Viewpoint considered and assessed initially, but not illustrated in favour of more relevant viewpoints selected through consultation with SNH.	
Note 1: Distance from closest turbine.		

7.2.1.2 Cumulative Wind Energy Development

In accordance with the SNH guidance²⁸ and the landscape architects decision, other wind energy development within a 70 km radius Search Area has been identified and considered for cumulative assessment. The Search Area, together with the locations for other known wind energy development is illustrated in Figure 7.9.

Table 7.3 provides a list of other wind energy development within the 70 km radius Search Area which has been included in the CLVIA and includes existing and consented developments as well as developments for which there is a submitted planning application.

The most relevant wind energy development to the CLVIA assessment includes all the existing Wind farms at Kelburn Estate, Wardlaw Wood (Dalry Community) and Ardrossan and extension and the consented Millour Hill/Wardlaw Wood extension Wind farm due to their comparative close proximity to the proposed Ascog Wind Energy Project. Other existing wind farms that are relevant to the CLVIA include the Cruach Mhor wind farm. Similarly the planning application site at Waterhead Moor and Cour are also contributors to the CLVIA.

Other existing/under construction wind farms are physically and visually more remote and hence less relevant to the CLVIA. The case is similar in respect of other consented, application and pre-application/scoping wind energy development beyond 35 km distance from the proposed Ascog Wind Energy Project.

²⁸ Guidance for the Assessment of Cumulative Landscape and Visual Impacts Arising from Wind farm Developments – Versions 2 and 3 (SNH Advisory Services, 2005 and March 2012).

Table 7.3: Wind Energy Development Included in the CLVIA within 35 km

Wind Farm Site	Details					Details
	No.	HH	RD	BT	Distance (km)	
Proposed Development						
Ascog	3	50	48	74	-	Rolling Farmland with Estates
Existing/Operational/Under Construction Wind Energy Development						
Kelburn Estate	14	60	80	100	15	Rugged Moorland Hills and Valleys
Wardlaw Wood (Dalry Community Wind Farm)	6	80	90	125	19	Rugged Moorland Hills and Valleys
Ardrossan and extension	15	60	80	100	21	Rugged Moorland Hills and Valleys
Cruach Mhor	35	45	52	71	24	Steep Ridgeland and Mountains
Consented Wind Energy Development						
Millour Hill/Wardlaw Wood extension	6	80	90	125	19	Rugged Moorland Hills and Valleys
Wind Energy Development with Submitted Planning Application or Under Appeal						
Waterhead Moor	29	70	84	112	13	Rugged Moorland Hills and Valleys and Rugged Moorland Hills
Cour	10	70	82	111	31	Upland Forest Moor Mosaic

Key:

(1) Wind farm number corresponding with Figure 7.9

No. Number of Turbines. RD Rotor Diameter (m)

BT Blade Tip Distance Distance from wind farm site centre

Note: This information has been collected from Planning and Developer sources up to 2 February 2012, and may be subject to change.

7.2.1.3 Cumulative Wind Energy Development Excluded from the CLVIA

The EIA regulations require identification of likely significant effects and whilst the SNH guidance requires a search of all wind farms within a 70 km radius it is not practical or indeed a requirement to assess all of these in terms of their cumulative effect in relation to the proposed Ascog Wind Energy Project. Wind energy development within the Search Area that has been excluded from the CLVIA is listed in Table 7.4 and the reasons are provided here. A number of these include wind farm development that is extremely remote (physically and visually), such that significant cumulative effects would not occur. Wind energy development within the Search Area that has been excluded from the CLVIA is listed in Table 7.4 and the reasons for these exclusions are also provided. A number of these include wind farm development that is extremely remote (physically and visually), such that significant cumulative effects would not occur. For example, the existing Ormsary/Alt Dearg Wind Farm is located approximately 36 km to the northwest of the proposed Ascog Wind Energy Project beyond Tarbert and would have little or no effect on the cumulative assessment.

Other wind energy developments at the pre-planning or scoping stage have been identified where known, but are not included in the CLVIA in accordance with the advice set out in the web-based Planning Advice Note (PAN) on Onshore Wind Turbines, previously PAN45.

Table 7.4: Cumulative Wind Energy Developments between 0 and 70 km which have been Excluded from the CLVIA

Wind Farm Site	Details				
	No.	HH	RD	BT	Distance (km)
<i>Existing/Operational/Under Construction Wind Energy Development</i>					
Ormsary/Alt Dearg	12	55	44	77	36
Deucheran Hill	7	46	66	79	38
	2	60	66	93	
Whitelee	140	65	90	110	43
Beinn an Tuirc	46	45	42	66	43.5
Beinn an Tuirc Extension	19	60	80	100	43.5
An Suidhe	23	56	48	80	46
Gigha Community Turbines	3	30	27	43.5	47.5

Whitelee Extension (Phase 1 & 2)	75	90	100	140	48
Myres Hill	2	40	52	66	50
Clachan Flats	9	60	66	93	51
Castlemilk	1	80	90	125	51
Tangy and Extension	22	52	49	75	55
Earlsburn	14 (15)	75	80	115	63
Beinn Ghlas	14	35	44	57	64
Braidhill	1	50	48	74	65
Craigengelt Hill	8	80	90	125	66
Hardyard Hill	52	60-70	82	101-111	66
Lochhead Wind Farm	3	60	62	91 (100)	69
Consented Wind Energy Development					
Neilston Community Wind Farm	4	65	90	110	36
A'Chruach	20	69	82	110	38
Middleton/James' Hill	6	64	82	105	39.5
Gigha Extension	1	32	54	59	47
Over Enoch and Ardoch	5	60	62	91	49
Cathkin Braes	1	80	90	125	50.5
Langlands Park	1	65	40	85	55
A G Barr Factory	1	80	92	126	55
Laigh Muirhouses Farm	3	-	-	115	57.5
Blantyre Muir	3	60	84	102	58.5
Backend Rig	11	45	62	76	59
Carraig Gheal	20	65-80	110-125	120- 142.5	59
Dungavel Hill	13	60 (80)	83 (80)	101.5 (110 + 120)	62
Stirling Road	1	80	92.5	126.25	67
North of Strutherhill Industrial Estate	1	71.5	77	110	68
Damhead	1	64	71	99.5	68.5
Greengairs	9	80	90	125	69
Lochhead Farm Extension 1	2	59	82	100	69.5

Wind Energy Development with Submitted Planning Application or Under Appeal					
Shewalton Moss/Glaxo	3	60	92	106	36
Harelaw Renewable Energy Park	39	-	-	118	37
Cowans Law	25	80	93	126.5	46
Ballindalloch Muir	9	-	-	125	53
Sainsburys	1	43	44	65	55.5
Calder Water	14	100	94	147	55.5
West Browncastle	12	80	93	126.5	56
Broadlees Farm/West Shawtonhill Farm	3	54	62	85	58.5
Earlsburn North/Extension	9	70	90	115	63
Kilchattan	16	51	60	81	63
Gartverrie	1	51	56	79	63
Calcarb Factory	1	64	71	99.5	64.5
Dersalloch	23	90	90	135	65
Burnhead	14	-	-	127	65
Bellstane	1	50	54	77	65.5
Eurocentral	1	64	71	99.5	66
Muir Park	11	-	-	126.5	67
Craigends Farm	1	51	56	79	69.5
Biggar Road	1	50	50	75	69.5
Wind Energy Development at Pre-Planning Application, Screening or Scoping Stage					
Wind Farm Site	No	Distance	Wind Farm Site	No	Distance
Hunterston	2-3	14	Bloomsfield Farm	1	61
Ballees Farm	1	19	Gainerhill Farm	1	62
Dykes Wind Turbine	1	21	Netherholm Farm	1	62.5
Skipness	35	21.5	Bedlay Wind energy project	2	62.5
Ardeer Golf Club	1	25	Shotlinn Farm	1	62.5
Jameston	1	27.5	Kirkwood Farm	1	63.5
Bridge Farm	6	35	Beinn Ghlas extension II	-	64
Cnoc an Fheidh	8	39	Ballygroggan Mark II	8	65
Creggan	26	45	Kype Muir	26	65.5
Blary Hill	18	46	Brackenhurst Farm	1	66
Auchadaduie	3	49	Aftonlea High	-	66

Loaninghead	3	49	Wellgreen Farm	1	66
Logoch Farm	1	54.5	Auchengree Farm	1	67
Highknoweglass Farm	1	56	Juanhill Farm	1	67.5
Coldwakening	1	58.5	Dykehead Road	1	68.5
Muirmains Farm	1	59	Daunsyston Farm	1	69
Kingsburn	-	60	Lochhead Farm Extension 2	3	69.5
Burn of Nethershield	1	60.5	Haspielaw Farm	1	61

Key:

(1) Wind farm number corresponding with HH Hub Height

Figure 7.9

No. Number of Turbines. RD Rotor Diameter

BT Blade Tip Distance Kilometres

7.2.2 Policy, Regulations and Guidance Context

The LVIA process has taken account of national and local planning policy in relation to wind farm development, as well as strategic landscape guidance from SNH. Further information on planning policy is provided in Chapter 4 of this ES.

7.2.2.1 National Landscape Planning Policy

National planning policy relevant to the study incorporates the following:

- Scottish Planning Policy (Scottish Government, 2010); and
- National Planning Framework for Scotland 2 (Scottish Government, 2009).

Paragraph 145 in the National Planning Framework for Scotland 2 states that “*the aim of national planning policy is to develop Scotland's renewable energy potential whilst safeguarding the environment and communities.*”

Paragraph 187 in Scottish Planning Policy states “*the design and location of any wind farm development should reflect the scale and character of the landscape. The location of turbines should be considered carefully to ensure that the landscape and visual impact is minimised.*” In terms of cumulative impact, paragraph 188 goes on to state that account should be taken of “*existing wind farms, those which have permission and valid applications for wind farms which have not been determined...Cumulative impact will largely relate to the scale and proximity of further development.*”

7.2.2.2 Local Landscape Planning Policy

The development plan relevant to the proposed wind farm incorporates the following documents:

- Argyll and Bute Structure Plan (Argyll and Bute Council, 2002); and
- Argyll and Bute Local Plan (Argyll and Bute Council, 2009).

These plans contain policies that specifically relate to the provision of wind energy and the installation of wind turbines. The policies relevant to this Chapter and related to landscape and visual effects are listed below in Table 7.5.

Table 7.5: Landscape Policies

Policy	Summary
<i>Argyll and Bute Structure Plan (2002)</i>	
STRAT DC 8 – Landscape and Development Control	<p>(A) Development, which, by reason of location, siting, scale, form, design or cumulative impact, damages or undermines the key environmental features of a visually contained or wider landscape or coastscape shall be treated as ‘non-sustainable’ and is contrary to this policy. Outwith the National Park particularly important and vulnerable landscapes in Argyll and Bute are those associated with:</p> <ol style="list-style-type: none"> 1. National Scenic Areas 2. Historic landscapes and their settings with close links with archaeology and built heritage and/or historic gardens and designed landscapes. 3. Landward and coastal areas with semi-wilderness or isolated or panoramic quality. <p>Protection, conservation and enhancement to landscape will also be encouraged in association with development and land use proposals.</p>
<i>Argyll and Bute Local Plan (2009)</i>	
Policy LP REN 1 – Wind Farms and Wind Turbines	<p>Wind farm proposals will be supported where they will not have an adverse impact on the environment. This policy also highlights specific landscape issues which must be taken into account:</p> <ul style="list-style-type: none"> - Communities, settlements and their settings. - Landscape and townscape character, scenic quality and visual and general amenity. - Sites of historic or archaeological interest and their setting.
Policy LP ENV 10 – Development Impact on Areas of Panoramic Quality	<p>Development in, or adjacent to, an Area of Panoramic Quality will be resisted where its scale, location or design will have a significant adverse impact on the character of the landscape unless it is demonstrated that:</p> <p>(A) Any significant adverse effects on the quality for which the area has been designated are clearly outweighed by social and economic benefits of National or regional importance;</p> <p>(B) Where acceptable, development must also conform to Appendix A of the Local Plan.</p> <p>In all cases the highest standards, in terms of location, siting, landscaping, boundary treatment and materials, and detailing will be required within Areas of Panoramic Quality.</p>

The landscape and visual assessment, including cumulative assessment, provided in this chapter provides information related to the issues raised in these policies in terms of effects on designated landscapes, and related landscape and visual receptors.

7.2.2.3 Strategic Landscape Guidance

The site area is located within 'Zone 2' of SNH's *Strategic Guidance for Onshore Wind Farms*. Zone 2 is defined as follows:

"Medium natural heritage sensitivity identifies areas with some sensitivities to wind farms. However, by careful choice of location within these areas there is often scope to accommodate development of an appropriate scale, siting and design (again having regard to cumulative effects) in a way which is acceptable in natural heritage terms."

In landscape terms however, it should be noted that the site is designated for Argyll and Bute Area of Panoramic Quality landscape reasons at a local level.

7.2.3 Landscape Capacity Assessment

The relevant current capacity assessment report is *Assessment of the Sensitivity of Landscapes to Windfarm Development in Argyll and Bute*, (Land Use Consultants for Scottish Natural Heritage and Argyll and Bute Council, 2002).

The site area is deemed to be located within the 'Rolling Farmland with Estate Landscape' Landscape Character Area (LCA) of "*moderate*" sensitivity to windfarms and the capacity and sensitivity of the landscape from field work carried out is one of inherent "*lower capacity and higher sensitivity*". It is considered however that this inherent or generic assessment would vary according to the type, scale and design of the proposed development. A well designed wind farm development may, for example, be considered acceptable within a landscape of lower capacity or moderate/higher sensitivity subject to detailed assessment of the landscape and visual effects.

Argyll and Bute Council have recently issued a new landscape capacity study *Argyll and Bute Landscape Wind Energy Capacity Study* (Carol Anderson and Alison Grant, Landscape Architects, March 2012). However, the study reports that '*It was necessary to prioritise funding for the study to address the main development pressures identified at the time of writing the brief and to fulfill the requirements of Scottish Government planning guidance.*

For this reason it was decided that detailed assessment of turbines of over 50 m to blade tip within NSAs and islands should not be included in the study. These assessments therefore focus on turbines up to 50m height with smaller turbines between 12-20 m high also being considered.'

Notwithstanding the limitations of the brief, Section 5 of the report does however provide a statement that the inherent sensitivity of the Rolling Farmland with Estate Landscape LCA to small-medium turbines (micro-generation 35-50 m high) would be high to medium and concludes that *'There is no scope for the small-medium typology to be located within this landscape type without incurring significant impacts on a number of sensitivity criteria.'* This observation indicates that significant landscape and visual effects are likely to occur in relation to turbines greater than 35 m in height. What is not clear however is whether there would be a notable 'step change' in the nature of significant landscape and visual effect generated in respect of taller turbines or any planning judgment on acceptability.

In terms of landscape capacity it should be noted that due to the limitations of the brief, this new report offers no specific guidance on landscape capacity in relation to the Ascog Wind Energy Project.

7.2.4 Methodology

The methodology for the LVIA has been undertaken in accordance with the methodology set out in Appendix F and conforms to the *Guidelines for Landscape and Visual Impact Assessment, Second Edition*²⁹ (GLVIA). Additional guidance has been taken from the following publications:

- Siting and Designing Windfarms in the Landscape, Version 1 (Scottish Natural Heritage, 2009);
- Visual Assessment of Wind Farms: Best Practice (University of Newcastle and Scottish Natural Heritage, 2002);
- Guidance for the Assessment of Cumulative Landscape and Visual Impacts Arising from Wind farm Developments – Versions 2 and 3 (SNH Advisory Services, 2005 and March 2012); and
- Photography and photomontage in landscape and visual impact assessment, Advice Note 01/11, edited by the Landscape Institute. Landscape Institute, (March 2011).

²⁹ Guidelines for Landscape and Visual Impact Assessment, Second Edition, Landscape Institute and IEMA, 2002.

The SNH document *Visual Representation of Wind Farms: Good Practice Guidance*³⁰ provides guidance on the production of graphics, including ZTVs and photomontages, for wind farm assessments.

In addition, the LVIA has made reference to a number of relevant planning documents including the Scottish Government's web-based Planning Advice Note (PAN) on Onshore Wind Turbines (previously PAN 45 Renewable Energy Technologies), Scottish Planning Policy and Development Plan Policy.

7.2.4.1 Defining the Study Area

The SNH guidance³¹ advises that the Study Area for wind turbines of this height should be based on an area of 30 to 35 km distance from each of the proposed turbine locations. The Landscape and Visual Study Area is illustrated in Figure 7.1 and in order to achieve the SNH guidelines, covers a circular area of 35.190 km radius from the application site centre (based on a minimum 35 km distance from each of the proposed turbine locations).

It is important to note that the boundary of the Study Area is not the limit of potential visibility in clear weather conditions. Rather it is an area defined by SNH, on the basis of research to determine a suitable Study Area for the assessment of wind farms, which would contain all potential significant landscape and visual effects.

7.2.4.2 Landscape and Visual Impact Assessment

Landscape effects are defined by the Landscape Institute as "Change in the elements, characteristics, character, and qualities of the landscape as a result of development. These effects can be positive or negative." Development may have a direct (physical) effect on the landscape as well as an indirect effect perceived from outside the 'host' landscape character or character unit (type or area) within which it is located. The potential landscape effects, occurring during the construction, operation and decommissioning phases, may therefore include, but are not restricted to, the following:

³⁰ Visual Representation of Wind Farms: Good Practice Guidance, report for SNH, the Scottish Renewables Forum and the Scottish Society of Directors of Planning, 2006.

³¹ Siting and Designing Windfarms in the Landscape, Version 1, Scottish Natural Heritage, 2009.

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- Changes to landscape elements: the addition of new elements or the removal of trees, vegetation, and buildings and other characteristic elements of the landscape character;
 - Changes to landscape qualities and characteristics: change to the condition of the landscape and/or the landscapes qualities and characteristics (including elements, patterns, and perceptual characteristics) particularly those which are considered as 'key' or defining characteristics;
 - Changes to landscape character: the magnitude of change is sufficient to alter a notable part of the overall landscape character of a particular area; and
 - Cumulative landscape effects: where cumulative development change, in this case more than one wind farm, may lead to a potential landscape effect.

Visual effects are concerned wholly with the effect of development on views, and the general visual amenity. The visual effects are identified for different receptors (people) who would experience the view at their places of residence, during recreational activities, at work, or when travelling through the area. The visual effects may include the following:

- Visual effect: a change to an existing view, views or wider visual amenity as a result of development; and
- Cumulative visual effects: the cumulative visibility of development change and in particular the cumulative visibility of more than one wind farm, which may combine to have a cumulative visual effect.

Essentially the level of landscape and visual effect (and whether this is significant) is determined through consideration of the 'sensitivity' of the landscape or visual receptor to the proposed development and the 'magnitude of change' caused by the proposed development, in this case the construction of a wind farm and associated infrastructure; the operation of the wind farm for a period of 25 years; and subsequent decommissioning.

The process involves iterative design and re-assessment of any remaining, residual effects that could not otherwise be mitigated or 'designed out'. Landscape or visual sensitivity specific to this development is ranked from high, medium, low to negligible (with negligible as the lowest or least sensitive) and the magnitude of change is ranked from high, medium, low, negligible to zero (with zero as the lowest or least magnitude of change) as indicated in Table 7.6. The type of effect is also considered and may be direct or indirect, temporary (reversible) or permanent, cumulative, and positive, neutral, or negative. Where relevant, mostly in relation to cumulative effects, the probability of an effect is also stated.

The landscape and visual assessment unavoidably involves a combination of both quantitative and subjective assessment and wherever possible has sought to gain a consensus of professional opinion through consultation, peer review, and the adoption of a systematic, impartial, and professional assessment approach.

In accordance with the EIA Regulations, it is important to determine whether the predicted effects are likely to be 'significant'. Significant landscape and visual effects, in the assessor's opinion, resulting from the proposed development would be all those effects that result in a 'substantial' or a 'moderate/substantial' effect and any exceptions would be clearly explained (refer to Table 7.6). There may, for example, be exceptions in the case of lower magnitudes of change affecting receptors of higher landscape and/or visual sensitivity, leading to a moderate effect that in some circumstances may be considered as significant with regard to the EIA Regulations. A full description of the methodology used in this assessment is set out in Appendix F.

It is also worth noting that wind farm development is in a different category to other forms of development such as mineral extraction or housing development. Generally wind farm development will have a 'small' development footprint, and entails the addition of tall structures to the landscape, usually without removing other physical elements of the landscape such as trees or woodland, although the site area may be large. Wind farm development also includes aspects of visual permeability and reversibility, although generally the visual effects are most likely to form the greater part of the assessed effects.

Table 7.6: Evaluation of Landscape and Visual Effects

Magnitude of Change	Landscapes and Visual Sensitivity			
	High	Medium	Low	Negligible
Very High	Substantial	Substantial	Moderate/ Substantial	Moderate
High	Substantial	Moderate/ Substantial	Moderate	Slight
Medium	Moderate/ Substantial	Moderate	Slight	Slight/Negligible
Low	Moderate	Slight	Slight/Negligible	Negligible
Negligible	Slight	Slight/Negligible	Negligible	Negligible
Zero	No change	No change	No change	No change

Key

Significant in terms of the EIA Regulations.

Not Significant in terms of the EIA Regulations

7.2.4.3 Cumulative Landscape and Visual Impact Assessment

The Cumulative Landscape and Visual Impact Assessment in accordance with SNH guidance³² considers the extent to which the proposed Ascog Wind Energy Project, in combination with other wind energy development, may change the landscape resource.

The CLVIA draws from information on other wind energy development within a 70 km radius Search Area. This allows for the possibility that other development between 35 km and 70 km from the proposed Ascog Wind Energy Project may be cumulatively visible from the edge of the Study Area, and thus have a cumulative effect on the landscape and visual resource within the 35 km radius Study Area.

Several types of cumulative effect are possible and are defined as follows:

- Cumulative Landscape Effects: Where more than one wind development may have an effect on landscape character or a landscape designation; and

³² Siting and Design Windfarms in the Landscape, Version 1 (Scottish Natural Heritage, 2009) and Guidance for the Assessment of Cumulative Landscape and Visual Impacts Arising from Wind farm Developments – Version 2 (SNH Advisory Services, 2005).

- Cumulative Visual Effects: Where more than one wind energy development may be visible.
 - Simultaneous or combined – where two or more developments may be viewed from a single fixed viewpoint simultaneously, within the viewer's field of view and without requiring them to turn their head. Note: A person's field of view is variable but is approximately 90° when facing in one direction.
 - Successive or repetitive – where two or more developments may be viewed from a single viewpoint successively as the viewer turns their head through 360°.
 - Sequential – where a number of developments may be viewed sequentially or repeatedly from a range of locations when travelling along a route within the Study Area.

The cumulative development of wind farms within a particular area may build up to create different types of cumulative effect as defined by SNH³³, as follows:

"The wind farms are seen as separate isolated features within the landscape character type, too infrequent and of insufficient significance to be perceived as a characteristic of the area.

The wind farms are seen as a key characteristic of the landscape, but not of sufficient dominance to be a defining characteristic of the area.

The wind farms appear as a dominant characteristic of the area, seeming to define the character type as a 'wind farm landscape' character type."

The level and significance of cumulative landscape or visual effects is determined in the same manner as for the LVIA, i.e. through a combination of sensitivity and magnitude of change. The resulting level of cumulative effect can emerge through four scenarios or combinations of cumulative effect, taking account of other wind energy development as follows:

- A significant effect from the proposed Ascog Wind Energy Project is predicted in addition or combination with another significant effect attributed to other development(s). The effect is still termed significant and cumulative, but is a greater level of effect than for either development individually;
- A significant effect from the proposed Development is predicted in addition or combination with another non-significant effect attributed to other development(s). The effect is still termed significant and cumulative, but is attributed to the proposed

³³ Siting and Design Windfarms in the Landscape, Version 1 (Scottish Natural Heritage, 2009).

Ascog Wind Energy Project and is a greater level of effect than for either development individually;

- A non-significant effect from the proposed Ascog Wind Energy Project is predicted in addition or combination with another significant effect attributed to other development(s). The effect is still termed significant and cumulative, but is attributed to the other wind energy development(s) and is a greater level of effect than for either development individually; and
- A non-significant effect from the proposed Ascog Wind Energy Project is predicted in addition or combination with another non-significant effect attributed to other development(s). The effect is still termed cumulative and is a greater level of effect than for either development individually; the combined effect however, may or may not be significant.

For clarity, where significant cumulative effects have been predicted the responsible wind energy development(s) is identified and noted in brackets in the summary tables. A full description of the cumulative assessment methodology is provided in Appendix F.

7.3 Baseline Conditions

Information on the existing landscape resource or baseline conditions, included in this assessment, has been collected from local plans, OS maps, and relevant literature, including SNH's Landscape Assessment of Argyll and the Firth of Clyde³⁴, Ayrshire Landscape Assessment and Glasgow³⁵, the Clyde Valley Landscape Assessment³⁶ and An Assessment of the Sensitivity and Capacity of the Scottish Seascapes in Relation to Windfarms³⁷, as well as information gathered from field surveys. This baseline information is set out as an inventory of the existing landscape resource and focuses on those landscape and visual receptors most likely to be potentially significantly affected.

The baseline inventory is set out as follows:

- Baseline Landscape Receptors:
 - Landscape Character of the proposed Ascog Wind Energy Project site;

³⁴ Environmental Resources Management on behalf of Scottish Natural Heritage, Tayside Landscape Character Assessment, SNH Report No 78, 1996.

³⁵ Land Use Consultants on behalf of Scottish Natural Heritage, Ayrshire Landscape Assessment, SNH Report No 111, 1998.

³⁶ Land Use Consultants on behalf of Scottish Natural Heritage, Glasgow and the Clyde Valley Landscape Assessment, SNH Report No 116, 1999.

³⁷ Landscape Research Group on behalf of Scottish Natural Heritage, An Assessment of the Sensitivity and Capacity of the Scottish Seascapes in Relation to Windfarms, SNH Report No 103, 2005.

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- Landscape Character of the Surrounding Area; and
 - Landscape Designations;
 - Baseline Visual Receptors:
 - Visual Receptors: Residential Properties;
 - Visual Receptors: Settlements;
 - Visual Receptors: Transport Routes;
 - Visual Receptors: Recreational Routes; and
 - Visual Receptors: Recreational and Tourist Destinations; and
 - Information Gaps.

7.3.1 Baseline Landscape Receptors

The ZTV and viewpoint analysis indicates that the assessment should be focused on a detailed Study Area of approximately 2-3 km radius from the proposed turbines. Taking a precautionary approach, the landscape assessment has been focused on those landscape receptors within 10 km. Within the wider 10-35 km Study Area, the assessment has included those receptors which are of national importance such as National Scenic Areas and SNH Search Areas for Wild Land.

The landscape receptors included in this assessment include landscape character areas and related landscape planning designations.

The landscape character of the Study Area is classified in the following publications and associated maps:

- Landscape Assessment of Argyll and the Firth of Clyde;
- Ayrshire Landscape Assessment;
- Glasgow and the Clyde Valley Landscape Assessment; and
- An Assessment of the Sensitivity and Capacity of the Scottish Seascape in Relation to Windfarms.

Each of these reports divides the landscape into broad areas of Land and Seascape Character Types (LCT) as well as more localised and area specific Landscape Character Areas (LCA). Each of the LCTs within the Study Area is illustrated in Figure 7.5.

7.3.2 Landscape Character of the Ascog Wind Energy Project Site

The proposed Ascog Wind Energy Project would be located within the Bute Landscape Character Area and Lowland Rolling Farmland with Estates Landscape Character Type which would be the 'host' landscape and is identified as LCA '20' on Figure 7.5.

Lowland Rolling Farmland with Estates Landscape Elements (20)

The Lowland Rolling Farmland with Estates Landscape comprises two areas which can merge together or appear as more separate areas, dividing into 'estate woodlands' which are more heavily wooded and closely associated with the 'estate landscapes' such as Mount Stuart and those areas which are within the more open landscapes comprising lowland rolling farmland. The land use and landscape pattern is one of a regular patchwork of large fields enclosed by broadleaf woodlands and shelterbelts or stone walls. There are many hedgerows without trees allowing distant open views across the rolling farmland, framed by the taller vegetation.

Many of the woodlands are estate policies and are attached to historic designed landscapes such as Mount Stuart. Such estates have associated stone walls, gatehouses, beech hedges and specimen trees and add to the richness and diversity of the landscape. In areas there are prominent local landmarks created by small stands of woodland. Within this relatively enclosed farmland landscape, it is important to retain the hedgerows and their trees which are a landscape element highly sensitive to change. Within the rolling landform and structured woodland that provides screening, there are some opportunities to accommodate the changes of new development.

The Ascog Wind Energy Project site itself is on a localised hill (Hill of Ascog 104 m AOD) within the Ascog Farm of permanent pasture. To the north is a localised steep valley at High Bogany, housing a Scottish Water and Waste Water Treatment Works and to the south the land falls more gently towards Balmory. To the east and west are minor roads with some associated housing, the A844 to the east running closely along the coastline of the Firth of Clyde. At the base of the hill to the east is particularly well vegetated with mature trees. To the west the land falls gently towards Loch Ascog.

The key landscape characteristics of the Lowland Rolling Farmland with Estates Landscape relevant to the study are listed as follows:

-
- Broad, rounded ridges with occasional steep banks, knolls and conical upstanding hills;
 - Flat coastal plain with sandy bays along the Firth of Clyde;
 - Groups of fairly large, rectangular fields, enclosed by linear shelterbelts and blocks of mixed woodland;
 - Stone walls, follies, beech hedgerows and estate policy woodlands;
 - Numerous hedgerows trees, often forming avenues along lanes;
 - Scattered large farmsteads in countryside; and
 - Urban development on coastal plain and broader vales.

7.3.3 Local Landscape Character of the Surrounding Area

Beyond the 'host' LCA, the proposed Ascog Wind Energy Project would not have a direct effect on landscape character. Rather the landscape effects would be indirect and relate to views and visual or perceptual characteristics which are a key feature of the surrounding landscape character. The ZTV and viewpoint analysis indicates that significant visual effects would occur within approximately 2 to 3 km, receding in magnitude and unlikely to be significant beyond this distance. The following local landscape character types (LLCT) are within 10 km of the nearest proposed turbine:

- (1) Basalt Lowlands;
- (2) Coastal Plain;
- (4) Craggy Upland;
- (15) Open Ridgeland;
- (21) Rocky Mosaic;
- (23) Steep Ridgeland and Mountains;
- (29) Coastal Fringe with Agriculture;
- (36) Raised Beach Coast; and
- (39) Rugged Moorland Hills and Valleys.

7.3.4 Landscape Character within the 10 to 35 km Radius Area

At further distances (i.e. between 10 and 35 km), the assessment has only considered those landscapes where the landscape is designated at a national level such as National Scenic Areas and National Parks.

The following, nationally designated landscape character types, within the Study Area and included within the assessment are listed as follows:

- Coastal Headland;
- Rugged Granite Uplands; and
- Open Upland Hills.

Other landscapes (including Coastal Lowland Moor, Rugged Moorland Hills and Valleys with Forestry, Open Ridgeland, Forested Parallel Ridges, Lowland Loch and Shore, Open Glen Side, Open Upland Glen, River Valley Farmland, Forested Parallel Ridges, Lowland Loch and Shore, Open Glen Side, Open Parallel Ridges, and River Valley Farmland) are not overlapped by the ZTV and would not be affected by the proposed Ascog Wind Energy Project. These landscapes have been excluded from further assessment.

7.3.5 Seascape Character

The assessment has also considered the seascape effects on seascape character and includes an assessment on National Seascape Type 9: Sounds, Narrows and Islands, which is the only type occurring within 10 km. Detailed assessment has considered the seascape character areas at Rothesay Bay, Ascog Bay and Kerrycroy Bay/Mount Stuart.

7.3.6 Landscape Designations

The proposed Ascog Wind Energy Project site is not designated for landscape reasons at a national level but at a local level it is identified as being within the Argyll and Bute Area of Panoramic Quality.

There are no nationally designated landscapes within 5 km of the proposed Ascog Wind Energy Project.

Landscape designations within 10 km are listed as follows (see Figure 7.6a in Appendix F):

- North Ayrshire Sensitive Landscape Area; and
- Kyles of Bute National Scenic Area.

Within the wider 10 to 35 km Study Area the assessment has considered the effects on nationally designated landscapes as follows:

- North Arran National Scenic Area;
- Loch Lomond National Scenic Area; and

- Loch Lomond and the Trossachs National Park.

Other designations within the study area that are not overlapped by the ZTV and would not have a view of the proposed Ascog Wind Energy Project have been excluded from further assessment. These include the Knapdale NSA, and Country Parks at Brodick Castle, Eglinton, Castle Semple, and Gleniffer Braes.

7.3.7 Baseline Visual Receptors

The visual assessment draws from the ZTV, site visits, and viewpoint analysis and assesses the potential visual effects on views and visual amenity likely to be experienced by receptors (people) within the landscape as follows:

- Views from residential properties and settlements;
- Views experienced whilst travelling through the landscape (road users, walkers, horse riders and cyclists for example); and
- Views from tourist and recreational destinations.

The viewpoint assessment is summarised in Table A7.4 (in Appendix F) and the analysis indicates that significant effects would extend to an area of approximately 2 km distance from the nearest proposed wind turbines as indicated by Viewpoint 1: Common Hill³⁸, and Viewpoint 3: Rothesay on the Isle of Bute. Further detailed site survey and analysis reveals that some limited significant visual effects may also occur at distance of between 2 to 3 km from the turbines to the south and southwest of the Ascog Wind Energy Project in the vicinity of Loch Ascog and the West Island Way.

In terms of cumulative effects, the proposed Ascog Wind Energy Project is isolated from other wind farms due to its island location, the nearest being on the mainland at Kelburn Estate at approximately 15 km distance from Ascog. The cumulative viewpoint assessment indicates that there would be no significant cumulative effects (with the exception of viewpoint 3), with many viewpoints recording little or no cumulative wind farm visibility.

Importantly these levels of effect are indicative of a visual effect on a particular viewpoint location and they should not be assumed to translate into visual effects on the overall visual experience, as each of the viewpoints has been specifically located where the sensitivity of

³⁸ Locally known as Canada Hill

the receptor and the views of the Ascog Wind Energy Project would be greatest, in this sense they are not typical or representative.

7.3.8 Visual Receptors: Settlements and Residential Properties

The assessment of visual effects likely to be experienced from settlements draws from the viewpoint analysis and site survey information and includes consideration of residential areas, the public realm, and public open spaces within the settlement boundaries that would be frequented by people. Rothesay and Port Bannatyne are the only settlements within the Ascog Wind Energy Project ZTV and the 5 km detailed study area.

Settlements included within the assessment are listed as follows:

- Rothesay and Port Bannatyne.

Planning law contains a widely understood principle that individuals (i.e. visual receptors at a single residential property) have no 'right to a view' per se with the outlook or view from a private property (i.e. that available to a residential visual receptor) being a private interest and not therefore protected by the UK planning system, although the planning system also recognises situations where a substantial number of people's views could be affected could be considered to be a matter of public interest.

However, decisions at some public inquiries involving wind farms have examined the related aspect of residential amenity, which includes other effects such as noise, and shadow flicker as well as visual intrusion. In addition to identifying those residential properties which would view the turbines whether this would be significant, this assessment has considered visual intrusion in relation to residential amenity, sometimes also referred to as visual residential amenity. This relates to whether the turbines would have an overbearing or dominating unattractive effect on living conditions and leading to an unacceptably detrimental impact on residential amenity which may result in the coincidence of public and private interests. In such circumstances the impact of the presence of the turbines becomes a material (planning) consideration. Hence it is necessary for the visual assessment to consider if this situation would arise in relation to the properties closest to the proposed wind energy project and therefore likely to be most affected. Based on a number of public inquiry decisions on wind farm development those properties within 1 km of the proposed Ascog Wind Energy Project have been assessed.

In respect of the proposed Ascog Wind Energy Project there are thirty-five properties/groups of properties within 1 km. Settlement is concentrated on the east side of the proposed site parallel to the minor road A844, looking out across the Firth of Clyde. These have been assessed and provide an indication of the overall visual effects within 1 km of the proposed wind farm.

In all, the residential properties which lie within 1 km and settlement which lies within 5 km of the proposed Ascog Wind Energy Project have been included in the assessment and are illustrated in Figures 7.6b and 7.8.

7.3.9 Visual Receptors: Transport Routes by Road

The visual assessment considers the potential visual effects likely to be experienced by people travelling through the landscape on main roads and ferry routes. Routes extending within approximately 5 km of the proposed Ascog Wind Energy Project have been assessed in detail, including railway lines. There are several single track unfenced roads within close proximity to the wind energy project and these are also assessed.

Transport routes included within the assessment are listed as follows:

- Transport routes within 5 km:
 - ‘A’ class roads: A844, A886, A815 and A78;
 - ‘B’ class roads: B881, B878, B875 and B896; and
 - Single track roads: Toward Point to Inverchaolain; and
- Transport routes within 10 km to 35 km:
 - ‘A’ class roads: A770 and A841.

It is noted that other main routes within the Study Area are not overlapped by the ZTV and would not view the proposed Ascog Wind Energy Project.

7.3.10 Visual Receptors: Transport Routes by Ferry

The visual assessment considers the potential visual effects likely to be experienced by people travelling on ferry routes. The ferry routes which fall within the ZTV are as follows:

- Firth of Clyde Routes:
 - Gourock to Dunoon;
 - Gourock (McInroy’s Point) to Dunoon (Hunter’s Quay);
 - Bute: Wemyss Bay to Rothesay;

- Cumbræ: Largs to Cumbræ Slip; and
 - Arran: Ardrossan to Brodick; and
- Kilbrannan Sound Route:
 - Arran: Claonaig to Lochranza

Other routes within the study area which are not overlapped by the ZTV and would have no view of the proposed Ascog Wind Energy Project have been excluded from the assessment. These include the Firth of Clyde route: Gourock to Kilcreggan to Helensburgh, the Kyles of Bute route: Colintraive to Rhubodach, and the Cowal and Kintyre route: Tarbert (Loch Fyne) to Portavadie.

7.3.11 Visual Receptors: Recreational Routes and Tourist Destinations

Recreational and tourist destinations included in this assessment include those features that appear as prominent landmarks or landscape features and locations associated with passive recreation such as walking and where there is a clear relationship between the feature/destination and the landscape. The assessment for example excludes locations for sports such as quad biking and team sports or other recreational/tourist destinations where the focus of activity is indoors, for example museums, libraries, and gift shops. The proposal site itself is not a tourist attraction or recreational area.

7.3.12 Local Recreational Routes (within 5 km)

The visual assessment has considered the views from local recreational routes within 5 km of the proposed Ascog Wind Energy Project. Those routes included within the assessment have been based on the proposed Core Path Network sourced from the Argyll and Bute Council Finalised Draft Core Paths Plan (December 2010), which is partly illustrated in Figure 7.6b. Currently there are no adopted core paths within Argyll and Bute. Core Paths were created in response to the Land Reform (Scotland) Act 2003 and attempt to give the public reasonable access throughout their area and may be created for a range of purposes include linking communities, providing access to land and for recreation.

Recreational routes (Draft Core Paths) included within the assessment are listed as follows:

- C232 (c);
- C252(c);
- C241;
- C242(a);

-
- C242 (c);
 - C237(b);
 - C237 (a);
 - C237 (c);
 - C317;
 - C250(a and b);
 - C249;
 - C232(a);
 - C248;
 - C410 and C411; and
 - C222 and C208 and C402.

Other routes within the study area which are not overlapped by the ZTV and would have no view of the proposed Ascog Wind Energy Project have been excluded from the assessment.

7.3.13 National Recreational Routes (within 35 km)

The visual assessment has considered the views from national recreational routes within the 35 km Study Area, which includes long distance routes and Sustrans national cycle ways. There are no long distance Ride UK horse riding routes. All the routes are illustrated in Figures 7.6b and 7.7 as follows:

- Long Distance Footpath:
 - West Island Way;
 - Five Degrees West Challenge;
 - Ayrshire Coastal Path;
 - Kintyre Way; and
 - Three Lochs Way; and
- Sustrans National Cycle Routes 78, 73 and 75.

Other routes within the study area which are not overlapped by the ZTV and would have no view of the proposed Ascog Wind Energy Project have been excluded from the assessment. These include the Cowal Way Long Distance Footpath and Sustrans National Cycle Route 7.

7.3.14 Sailing and Kayaking Recreational Routes and Launching Points (within 35 km)

The popular sailing and kayaking routes, and any launching points as identified in the Argyll and Bute Council Finalised Draft Core Paths Plan (December 2010), are partly illustrated in Figures 7.6b and 7.7.

- Sailing Routes;
- Kayaking Routes; and
- Launching Points:
 - L067; and
 - L090.

7.3.15 Tourist Destinations (within 5 km)

Tourist destinations included in this assessment within 5 km of the proposed turbines are listed as follows:

- Mount Stuart;
- Castle Toward;
- Toward Point Picnic Site; and
- Rothesay Golf Club.

7.3.16 Tourist Destinations (within 5 to 35 km)

Other tourist destinations within the ZTV and wider study which have also been included in this assessment area are listed as follows:

- Clyde Muirshiel Regional Park;
- Kelburn Castle and Country Centre;
- Loch Lomond Regional Park;
- Skelmorlie Golf Club;
- Largs;
- Lunderston Bay, Ardgowan and Largs Bay;
- Great Cumbrae Island;
- Farland Head;
- Sannox;
- Innellan; and
- Roseneth Cove.

In addition, there are numerous tourist attractions within the Study Area which are outwith the ZTV (there would be no view of the proposed Ascog Wind Energy Project from these locations) and these have been excluded from the study.

7.3.17 Information Gaps

The assessment of residential properties is limited to those properties which appear on the Ordnance Survey 1:10,000 scale map although it is possible that there may be un-mapped properties, including any constructed since the assessment.

7.4 ZTV and Viewpoint Analysis

The Zone of Theoretical Visibility (ZTV) and viewpoint analysis is used to assist the design and further define the scope of the assessment process. In particular, a significance threshold indicating the distance from the proposed Ascog Wind Energy Project, where significant effects may be likely, has been identified. This has been used to focus the baseline information and detailed reporting of the assessment in this Chapter.

7.4.1 ZTV Analysis

The ZTV was calculated using the ReSoft © Wind farm computer software to produce an area of potential visibility of any part of the proposed wind energy project calculated to turbine blade tip and hub height. The ZTV however, does not take account of built development and vegetation, which can significantly reduce the area and extent of actual visibility in the field and as such provides the limits of the visual assessment Study Area.

The ZTV maps indicate the areas from where it may be theoretically possible to view all or some of the proposed wind turbines, calculated on the candidate turbine heights of 74 m to blade tip, 50 m to hub height, and rotor diameter of 48 m. A number of ZTV maps have been provided as follows:

- Figure 7.2 illustrates the viewpoint locations and ZTV calculated to blade tip at 1:300,000 scale across the Landscape and Visual Study Area and provide an overview of the theoretical extent of visibility;
- Figure 7.3 (AO fold-out) illustrates the viewpoint locations and ZTV calculated to blade tip at 1:100,000 scale across the Landscape and Visual Study Area; and

- Figure 7.4 illustrates the ZTV calculated to hub height at 1:300,000 across the Landscape and Visual Study Area.

The ZTVs do not take account of the screening effects of buildings, localised landform variations, or vegetation. As a result there may be roads, tracks, and footpaths in the wider setting which, although shown as falling within the ZTV, have restricted viewing opportunities since they are heavily screened or filtered by banks, walls, and vegetation. The ZTVs therefore provide a starting point in the assessment process and accordingly tend towards giving a 'worst-case' or over-estimated scenario of the potential visibility of the turbines.

7.4.2 ZTV Analysis: Proposed Ascog Wind Energy Project

The general visibility of the proposed Ascog Wind Energy Project reflects the underlying landform within the 35 km radius Study Area. The ZTV pattern is sporadic and accounts for 15 % of the total study area.

Within the 10 km radius theoretical visibility is concentrated on the slopes of hills and open ridges facing the application site in all directions, and the Firth of Clyde and Loch Striven water corridors to the east and north of the application site respectively. Of note is the exclusion of much of the northern part of the Isle of Bute and the settlement of Rothesay.

Within the 10 to 35 km radius bands, 'on land' visibility is concentrated in coastal areas to the north, east, south and west, again where there are cliffs and slopes of summits facing the application site, namely Toward Point and Quay and Strone Point of Cowan, the coastal edge of the mainland including Largs, the northern coastline of Arran including Sannox and the eastern coastline of Kintyre including Cour. The sea visibility is concentrated along the open water corridors of the Firth of Clyde, Loch Striven, Kilbrannan Sound and Sound of Bute.

7.4.3 Cumulative ZTV Analysis

The cumulative ZTVs have been calculated to blade tip and, as above, take no account of the screening effects of vegetation, landscape features, woodland, or buildings, and assume clear visibility. In order to provide effective analysis, the cumulative ZTVs have been produced to illustrate the ZTV footprints of selected wind energy development, which has been logically grouped in relation to planning status or geographical location. The list of the figures illustrating cumulative ZTV maps is provided as follows:

- Figure 7.10 – Cumulative ZTV to Blade Tip: Existing/Under Construction, Consented and Application Sites within 35 km;
- Figure 7.11 - Cumulative ZTV to Blade Tip: Ascog with Existing/Under Construction and Consented sites within 35 km; and
- Figure 7.12 – Cumulative ZTV to Blade Tip: Ascog with Existing/Under Construction, Consented and Application Sites within 35 km.

7.4.4 Cumulative ZTV Analysis: Existing/Under Construction, Consented and Application Sites

The cumulative ZTV indicates the pattern of theoretical visibility for the proposed Ascog Wind Energy Project in addition to four other existing/under construction/consented wind farms which are projected together and comprise Ardrossan, Wardlaw Wood, and Kelburn and their respective consented extensions. A further existing wind farm is located in the north at Cruach Mhor. There are two application wind farm sites within the study area, namely Waterhead Moor to the northeast of Largs and Cour wind farm in the Kintyre peninsula.

The ZTV indicates the existing and consented pattern of theoretical visibility as well as the potential theoretical visibility to the two application sites.

7.4.5 Cumulative ZTV Analysis: Ascog with Existing/Under Construction and Consented Sites

The cumulative ZTV indicates the pattern of theoretical visibility for the proposed Ascog Wind Energy Project in addition to five existing/under/construction and consented wind farms within the study area, namely Ardrossan, Wardlaw Wood, and Kelburn and their respective consented extensions.

The ZTV indicates 'new' areas of theoretical visibility related to the proposed Ascog Wind Energy Project which are shown in yellow.

7.4.6 Cumulative ZTV Analysis: Ascog with Application Sites

The cumulative ZTV indicates the pattern of theoretical visibility for the proposed Ascog Wind Energy Project in addition to the two other application wind farm sites within the study

area, namely Waterhead Moor to the northeast of Largs, and Cour wind farm in the Kintyre peninsula.

The ZTV indicates that the proposed Ascog Wind Energy Project would be most commonly visible in combination with the proposed Waterhead Moor application which would add further to the cumulative visual effects.

7.4.7 Viewpoint Analysis

The viewpoint analysis is recorded in Appendix F, and has been conducted from 21 locations as illustrated in Figure 7.2. The views from these locations are illustrated in Figures 7.13a/b to 7.35a/b.

The viewpoint assessment is summarised in Table A7.4 and the analysis indicates that significant effects would extend to an area of approximately 2 km distance from the nearest proposed wind turbines as indicated by Viewpoint 1: Common Hill, and Viewpoint 3: Rothesay on the Isle of Bute. Further detailed site survey and analysis reveals that some limited significant visual effects may also occur at distance of between 2 and 3 km from the turbines to the south and southwest of the Ascog Wind Energy Project in the vicinity of Loch Ascog and the West Island Way. This initial indication has been tested further as part of the assessment process, but provides justification for focusing the assessment on the central portion of the Study Area.

In terms of cumulative effects, the proposed Ascog Wind Energy Project is isolated from other wind farms due to its island location, the nearest being on the mainland at Kelburn Estate at approximately 15 km distance from Ascog. The cumulative viewpoint assessment indicates that there would be no significant cumulative effects (with the exception of viewpoint 3), with many viewpoints recording little or no cumulative wind farm visibility.

Importantly these levels of effect are indicative of a visual effect on a particular viewpoint location and they should not be assumed to translate into visual effects on the overall visual experience, as each of the viewpoints have been specifically located where the sensitivity of the receptor and the views of the Ascog wind energy project would be greatest, in this sense they are not typical or representative.

7.4.8 Sunlight and Weather Conditions

Changing weather patterns and local climatic conditions would influence the visibility of the proposed Ascog Wind Energy Project which will vary from periods of low visibility (fog, low cloud, and bright sunny conditions that are accompanied by haze generated by temperature inversions) as well as periods of high visibility in clear weather. In some instances the wind farm may appear 'back-lit' (e.g. appearing darker in colour during sunset/sunrise and periods of pale or white blanket cloud) and in other circumstances may appear to be 'up-lit' (e.g. during stormy periods that combine dark clouds and bright sunshine).

7.5 Mitigation Measures

The design process has involved a combination of environmental design and engineering to provide an appropriate compromise between maximising energy capture and achieving acceptable design in terms of landscape and visual issues. Taking account of guidance from planning policy advice and design guidance from SNH; the design has evolved considerably, ensuring that significant landscape mitigation is already 'embedded' within the proposed Ascog Wind Energy Project, prior to the assessment of residual effects.

7.5.1 Landscape Design Concept

The design concept has taken account of the SNH 'Guidance on Siting and Designing Windfarms' and has also been refined in close consultation with SNH during the design stage (July to October 2011). The final concept is based on the following simple objectives:

- To minimise landscape and visual effects on the Isle of Bute and key receptors;
- To minimise the horizontal and vertical scale of the wind energy project; and
- To relate the wind farm to the receiving Lowland Rolling Farmland with Estate Landscapes character.

The final layout of the proposed Ascog Wind Energy Project including the location of turbines and the access track layout has been influenced by constraints within the application site and elsewhere in the surrounding landscape.

7.5.2 Wind Turbines

The proposed turbines would have a maximum hub height of 50m and maximum rotor diameter of 48m, giving a maximum turbine height of 74m to blade tip.

The viewpoint analysis indicates that the turbines would frequently be viewed against the sky. For these reasons it is proposed that the standard turbine colour of pale grey would be most appropriate. The turbines would be uniform in colour (no company logos or advertising), with a semi-matt finish to reduce their contrast with the background sky and minimise their reflectivity.

7.5.3 Site Entrance and Access Tracks

Access tracks would be constructed to a width of 4m wide as shown on the site plan in Appendix A. The tracks would be left in place after completion of the wind turbine construction to allow for maintenance. Further details for access tracks can be found in Chapter 12.

7.5.4 Site Control Building, Electrical Cables and Grid Connection

A single storey high site control building (8 m wide by 5 m in length) would be located adjacent to Turbine 3 as shown on the site plan in Appendix A. The building is orientated east–west to reduce any potential skylining effects.

All of the on and offsite grid connection will be via underground cables. The electrical cables linking the turbines and the site control building would be buried within a trench alongside the proposed access tracks.

7.5.5 Temporary Construction Compound

The temporary construction compound would be located adjacent to the hard standing of Turbine 3 as shown on the detailed site plan in Appendix A. On completion, the temporary compound would be cleared and restored to grass land and left in a tidy condition.

7.5.6 Construction Mitigation

During the construction period, the effectiveness of many of the potential construction mitigation measures would depend on small-scale site management decisions regarding the precise location of construction activities. Individually these may only have minor effects, but cumulatively they would have an influence upon the intrusiveness of the construction activities overall. The key measures that can be implemented in order to avoid or reduce potential construction effects include:

- The selective and sensitive location of temporary storage areas for materials, plant, and security fencing.
- Using designated routes around the site for construction vehicles and operation of construction plant such as cranes.
- Implementation and monitoring of site management procedures, such as regular litter sweeps of the immediate environs to ensure the removal of all litter arising from the construction activities.

7.5.7 Operation Mitigation

The operational period of the wind farm would cover a period of 25 years and include site management to ensure the adequate maintenance of site facilities and landscape features such as access tracks, field boundaries, gates, and signage.

7.5.8 Decommissioning Mitigation

All of the visible, above ground structures (turbines, transformers, and site control building) would be removed upon decommissioning, thus rendering the vast majority of the landscape and visual effects as reversible. The access tracks and entrance area would remain over the longer term for use by the landowner.

7.6 Predicted Impacts: Landscape Effects

Landscape effects are defined by the Landscape Institute as “Change in the elements, characteristics, character, and qualities of the landscape as a result of development. These effects can be positive or negative”³⁹. These effects are assessed by considering the landscape sensitivity against the magnitude of change. The type of effect may also be described as temporary or permanent, direct or indirect, cumulative and positive, neutral, or negative.

The residual landscape effects, assessed here, are those effects remaining after all of the embedded design measures or inherent mitigation has been taken into account.

³⁹ Landscape Institute and IEMA, Guidelines for Landscape and Visual Impact Assessment, Second Edition 2002.

7.6.1 Ascog Wind Energy Project: Site Area

The proposed Ascog Development is located within grazing land forming part of the Rolling Farmland with Estates LCT. The effects on the site area and its component landscape elements are considered here.

7.6.2 Landscape Sensitivity

In terms of landscape quality and condition, the Ascog Wind Energy Project site comprises rolling grassland used for grazing at 104 m AOD. The landscape quality and condition of the site area is medium and the grassland elements within which the turbines are located of low sensitivity. The land forms part of the extensive Argyll and Bute Area of Panoramic Quality, a local designation and a waste water treatment works and reservoir are located close by indicating medium value. There are no special landscape features or public access across the site indicating higher value, although Common Hill, which is further to the north, illustrates higher landscape value and quality through the recreational use (Core Path and golf course on highland above Rothesay). In comparison the proposed Ascog Wind Energy Project site is further to the south.

In terms of landscape capacity the scale of this landscape is variable and medium in terms of scale with long distance views available from areas of high ground. The site location indicates medium landscape capacity for a smaller scale wind energy project.

Considering all of these aspects together (landscape quality, value and capacity), the Ascog Wind Energy Project site is considered to be of medium landscape sensitivity with the associated landscape elements typically of low landscape sensitivity.

7.6.3 Magnitude and Level of Effect: During Construction

The construction phase would result in localised direct landscape effects on the site and its component landscape elements. Table 7.7 provides an assessment of the level and type of landscape effect predicted in respect of each construction activity.

The main landscape element affected by the proposed Ascog Wind Energy Project would be grazing land (low sensitivity) to allow for the construction work's temporary construction compound and the proposed access tracks. However, this would directly affect a relatively

small area of land within the site; hence the magnitude of change would generally be low at most, resulting in a Slight level of effect that would not be significant.

Table 7.7: Landscape Effects during Construction

Construction Activity and Assessment	Landscape Assessment		
	Sensitivity	Magnitude	Level of Effect
Temporary Construction Compound The temporary construction compound would be established near turbine three, affecting a localised area of existing grazing land (of low landscape sensitivity). Given the limited area affected, the magnitude of change would be medium and the landscape effect would be Slight, not significant, temporary (reversible), direct, and negative.	Low	Medium	Slight
Access Track The tracks would be routed through and affecting a localised area of existing grazing land (of low landscape sensitivity). The construction of the tracks and areas of hardstanding would require the removal of approximately 50m of hedgerow field boundaries. Given the limited area affected, the magnitude of change would be medium and the landscape effect would be Slight, not significant, permanent, direct, and negative.	Low	Medium	Slight
Site Control Building The site control building would be established near turbine three, affecting a localised area of existing grazing land (of low landscape sensitivity). Given the limited area affected, the magnitude of change would be medium and the landscape effect would be Slight, not significant, temporary (reversible), direct, and negative.	Low	Medium	Slight

Construction Activity and Assessment	Landscape Assessment		
<p>Electrical Cables</p> <p>Routed along access track verges, the landscape effect would be Negligible to None and not significant. Although the works would be temporary, the cables would remain permanently and the nature of these landscape effects would be temporary, direct, and negative during construction; altering to neutral upon completion.</p>	Low	Zero to Negligible	None to Negligible
<p>Turbines</p> <p>As the works commence on site the magnitude of change associated with the proposed turbines would increase from zero to very high, directly affecting localised areas of grazing land and landscape character of the site as a whole. The landscape effect on the site (medium landscape sensitivity) would be None to Substantial and significant. The nature of these effects would be long term (reversible), direct, and negative to neutral.</p>	Medium	Zero to Very High	None to Substantial

7.6.4 Magnitude and Level of Effect: During Operation

During operation, the completed wind farm (including restored temporary construction compound) would gain a 'cleaner' and more 'settled' appearance when compared to the same area during the construction period.

During the operational period, the landscape effects on the site (medium sensitivity) would be very high, largely due to the introduction of the turbines. The level of effect would be Substantial and significant, directly affecting much of the site area and the surrounding hillsides within approximately 500 m, subject to woodland screening and lack of visibility to the north and east. The nature of these effects would be long-term (reversible), direct and negative to neutral.

The landscape effects on the site would be negative in respect of the unavoidable introduction of turbines to the rural landscape in terms of their large scale, moving, man-made character, and form; although equally these aspects could be viewed as dramatic and of visual interest set within a simple landscape. In this latter respect and due to the simple

composition, the wind farm would appear reasonably well accommodated, such that the landscape effects should also be regarded as neutral.

7.6.5 Magnitude and Level of Effect: During Decommissioning

During the decommissioning, the site would return to a construction site for a temporary period and, as with the construction period, the level of effect would be variable over the site and according to the phase of activity. In overall terms the magnitude of change would reduce from operational levels (very high) to between low and negligible with the removal of the turbines and associated above ground infrastructure, and areas of hardstanding. The access tracks however, would remain for use by the landowner on site.

In overall terms the level of effect would reduce to non significant levels of between Slight and Slight/Negligible. The nature of these effects would be permanent, direct, and negative to neutral when compared to the existing landscape of the local area.

7.6.6 Lowland Rolling Farmland with Estates LCT

The Lowland Rolling Farmland with Estates LCT is the 'host' landscape covering a much wider area than the Ascog Wind Energy Project site and the effects would be both direct and indirect (affecting visual and perceptual characteristics of the landscape).

The proposed Ascog Wind Energy Project would be located within the Lowland Rolling Farmland with Estates LCT. The key landscape characteristics of this LCT relevant to the study are as follows:

- Broad, rounded ridges with occasional steep banks, knolls and conical upstanding hills;
- Groups of fairly large, rectangular fields, enclosed by linear shelterbelts and blocks of mixed woodland;
- Stone walls, follies, beech hedgerows and estate policy woodlands;
- Numerous hedgerows trees, often forming avenues along lanes;
- Scattered large farmsteads in countryside; and
- Urban development on coastal plain and broader vales.

Landscape Sensitivity

The landscape quality and value of the Lowland Rolling Farmland with Estates LCT are considered medium to high on account of the Area of Panoramic Quality landscape designation which covers the entire LCT.

In terms of landscape capacity, the Lowland Rolling Farmland with Estates LCT displays a number of characteristics that indicate some capacity for wind farm development including the *broad, rounded ridges and fairly large, rectangular fields, and visual screening by linear shelterbelts and blocks of mixed woodland.*

However, this is balanced with the visual sensitivity of this LCT which increases with proximity to the coast.

There are no other existing wind energy developments within the LCT suggesting a low to moderate capacity for further wind energy development within this LCA. Overall, the capacity of the Lowland Rolling Farmland with Estates LCT is considered to be medium.

For the reasons described above, the overall landscape sensitivity is medium to high.

Magnitude of Change and Level of Effect

The proposed Ascog Wind Energy Project would not affect the physical characteristics of the Lowland Rolling Farmland with Estates LCT as listed within the SNH Argyll and Firth of Clyde Landscape Character Assessment (such as the topography or the field pattern), albeit there would be some effects on the key visual/perceptual characteristics not least by introducing a new feature to the landscape (wind turbines), although this must be seen in the context of a contemporary landscape and busy water way with ferries, coastal settlement, and infrastructure. Due to the rolling and hilly nature of the surrounding landform the ZTV pattern within the Lowland Rolling Farmland with Estates LCT is broken up and there are coastal locations and inland areas which are outside the ZTV and would be unaffected.

The area immediately surrounding the turbines (approximately 500 m radius from the nearest turbine) would be subject to very high and high magnitudes of landscape change and significant landscape effects would occur. Beyond this distance, within the Lowland Rolling Farmland with Estates LCT, the wind energy project would reduce in terms of its landscape effects and there would frequently be physical separation between the turbines and the landscape receptors by intervening landform and vegetation screening, reducing the potential for significant indirect landscape effects. Given the ZTV coverage and the relatively

small area in which significant effects would occur, the overall magnitude affecting the entire LCT as a result of Ascog Wind Energy Project would be low. The level of effect would be **Moderate** and not significant.

The type of effect would be negative in respect of the unavoidable introduction of turbines to the rural landscape in terms of their large scale, moving, man-made character, and form; although equally these aspects could be viewed as neutral given the large scale, open character of the receiving landscape, in which the proposed Ascog Wind Energy Project could be reasonably well accommodated. The nature of these effects would be long-term (reversible) direct and indirect.

Cumulative Landscape Assessment

There are no existing, consented or proposed wind farms located within the Lowland Rolling Farmland with Estates LCT and there would be no significant cumulative landscape effects.

7.6.7 Indirect Effects on the Local Landscape Character

Each of the surrounding Landscape Character Types and Areas and seascape character located within 10 km of the proposed Ascog Wind Energy Project has been assessed in Table 7.8. In addition, those landscapes which are designated at a national level within the wider Study Area have been assessed in Table 7.9. None of these landscapes would be directly affected by the proposed development as the turbines would not be located within them and there would be no change to their physical characteristics. Instead, potential effects on these landscapes would be limited to indirect effects on the visual or key perceptual characteristics, resulting from views of the proposed wind turbines.

Table 7.8: Indirect Effects on Local Landscape and Seascape Character (within 10 km)

Local Landscape Character Type (LLCT)	Landscape Assessment
Basalt Lowlands	<p>This LCT is located ~8 km to the south of the nearest proposed turbine at its closest point. Of the 7 km² total area, ~25% is overlapped by the ZTV. The sensitivity is medium. The level of effect of the proposed turbines at Ascog would be Slight/Negligible</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~12.5 km) and</p>

Local Landscape Character Type (LLCT)	Landscape Assessment
	the level of cumulative effect would remain as Slight/Negligible .
Coastal Plain	This LCT is located outside the ZTV and the level of effect of the proposed turbines at Ascog would be No Change
Craggy Upland	<p>This LCT is located ~8 km to the northwest of the nearest proposed turbine at its closest point. ZTV coverage is extremely limited and would only occur on isolated hill summits such as Windy Hill and Kilbridge Hill. The sensitivity is medium. Given the distance of view and the large unaffected areas, the level of effect of the proposed turbines at Ascog would be Slight/Negligible</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~20 km) and the level of cumulative effect would remain as Slight/Negligible.</p>
Open Ridgeland	<p>This LCT is located 2 km to the west of the nearest proposed turbine at its closest point. The sensitivity is medium. Approximately 25% of the LCT is covered by the ZTV and the affected areas tend to be the east and south facing slopes and summits including Barone Hill. The magnitude of change would vary from medium to zero and would be negligible overall. Given the distance of view and the large unaffected areas, the level of effect of the proposed turbines at Ascog would be Slight/Negligible</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~15 km) and the level of cumulative effect would remain as Slight/Negligible.</p>
Rocky Mosaic	<p>The ZTV coverage is limited to a tiny percentage of the total LCT area and the magnitude of change would be negligible overall and the level of effect of the proposed turbines at Ascog would be Slight/Negligible.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the windfarms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~20 km) and the level of cumulative effect would remain as Slight/Negligible.</p>

Local Landscape Character Type (LLCT)	Landscape Assessment
Steep Ridgeland and Mountains	<p>This LCT is located 6 km to the north of the nearest proposed turbine at its closest point (Toward Hill). The sensitivity is medium. Approximately 50% of the LCT within 10 km of the application site is covered by the ZTV and the affected areas tend to be the south facing slopes and summits including Kilmarnock Hill. The magnitude of change would vary from low to zero and would be negligible overall. Given the distance of view and the forested nature of much of this LCT, the level of effect of the proposed turbines at Ascog would be Slight/Negligible</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13 km) and the level of cumulative effect would remain as Slight/Negligible.</p>
Coastal Fringe with Agriculture	<p>This LCT is located 8 km to the southeast of the nearest proposed turbine at its closest point (Great Cumbrae). The sensitivity is medium. Approximately 90% of the LCT within 10 km of the application site is covered by the ZTV and the type of effect is illustrated in viewpoints 6 and 9 (low to negligible magnitude). The magnitude of change would vary from negligible to zero and would be negligible overall. Given the distance of view and the forested nature of much of this LCT, the level of effect of the proposed turbines at Ascog would be Slight/Negligible</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~6 km) and the level of cumulative effect would remain as Slight/Negligible.</p>
Raised Beach Coast	<p>This LCT is located 9 km to the east of the nearest proposed turbine at its closest point on the far side of the Firth of Clyde. The sensitivity is medium. 100% of the LCT within 10 km of the application site is covered by the ZTV and the type of effect is illustrated in viewpoint 8 (low to negligible magnitude). Given the distance of view, the magnitude of change would be negligible overall and the level of effect of the proposed turbines at Ascog would be Slight/Negligible</p> <p><u>Cumulative Assessment</u></p> <p>There would be no cumulative visibility and the level of cumulative effect would remain as Slight/Negligible.</p>

Local Landscape Character Type (LLCT)	Landscape Assessment
Rugged Moorland Hills and Valleys	<p>The ZTV coverage is limited to a small percentage of the total LCT area and the magnitude of change would be negligible overall and the level of effect of the proposed turbines at Ascog would be Slight/Negligible.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the windfarms on the North Ayrshire Moorland Hills (a number of which are located within this LCA) and the level of cumulative effect would increase to significant levels as a result of these other wind farm developments. The additional effect of the Ascog Wind Energy Project would remain as Slight/Negligible.</p>
Seascape Unit	Seascape Assessment
Sounds, Narrows and Islands (Seascape Type 9, Seascape Unit 20)	<p>This seascape consists of waterbodies and shorelines and is ~650m from the nearest turbine at its closest point. The key characteristics relevant to this assessment are slotted views out to open sea. The sensitivity of this LCT is high on account of its landscape quality, value, and medium capacity for wind farm development. The scale of the indirect landscape effects is illustrated in viewpoint 10 (low magnitude). The magnitude of change would vary between high and zero and, given the distance of view and the partial ZTV coverage, the overall magnitude would be negligible although there would be isolated significant effects within 4 km of the proposed turbines. The level of effect overall would be Slight and not significant. The nature of these effects would be long-term (reversible), cumulative and indirect.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~2.5 km) and there would be isolated significant cumulative effects as a result of Adrossan Wind Farm but the level of cumulative effect overall would remain as Slight.</p>
Local Seascape Area	Seascape Assessment
Rothesay Bay Seascape	<p>This detailed seascape character area is located to the north and north-west of the proposed development and is 1.6 km from the nearest proposed turbine at its closest point. ZTV coverage is limited to a narrow strip on the western side of the bay along adjacent to the A844. Views would be partial and the viewing distance would vary between 2 km and 3 km. Intervening vegetation would limit visibility to blade tips only. The magnitude of change would vary from negligible to zero and the overall level of effect would be Slight and not significant.</p>

Local Landscape Character Type (LLCT)	Landscape Assessment
	<p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, to the east (at minimum viewing distances of ~15 km) and the level of cumulative effect would remain as Slight.</p>
Ascog Bay Seascape	<p>This detailed seascape character area is located ~600 m to the east of the nearest proposed turbine at its closest point. As illustrated in Figure 7.8, ZTV coverage is limited to areas around Ascog Point and Ascog Rock. The minimum viewing distance would be ~700 m and localised significant effects would occur albeit not along the shoreline itself. Vegetation and landform would obscure the lower parts of the turbines, their full height not being apparent within ~1 km of the nearest proposed turbine. The magnitude of change would vary from high to zero and the overall level of effect would be Moderate and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~12 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Moderate.</p>
Kerrycroy Bay/Mount Stuart Seascape	<p>This detailed seascape character area is located to the south-east of the proposed development and is ~1.8 km from the nearest proposed turbine at its closest point. ZTV coverage is widespread although the sandy shore at Kerrycroy is outside the ZTV and there would be no view from this location. The viewing distance would vary between 1.8 km and 4 km and localised significant effects would occur along the northern edges of this area. Intervening vegetation would limit visibility to blade tips only. The magnitude of change would vary from medium to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~12 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>

Table 7.9: Indirect Effects on Nationally Designed Landscape Character (between 10 km and 35 km)

Landscape Character Type	Landscape Character Area and Assessment
Coastal Headland	<p>This LCT is located 18 km to the southwest of the nearest proposed turbine at its closest point (the Isle of Arran). The sensitivity is high. Approximately 50% of the LCT is covered by the ZTV and the type of effect is illustrated in viewpoint 18 (negligible magnitude). Given the distance of view and the potential for intervening screening, the magnitude of change would be negligible overall and the level of indirect effect of the proposed turbines at Ascog would be Slight</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~25 km) and the level of cumulative effect would remain as Slight.</p>
Rugged Granite Uplands	<p>This LCT is located 20 km to the southwest of the nearest proposed turbine at its closest point (the Isle of Arran). The sensitivity is high. Approximately 10% of the LCT is covered by the ZTV and affected areas are limited to north-east facing slopes and summits such as Beinn Bhreac. Given the distance of view and the potential for intervening screening, the magnitude of change would be negligible overall and the level of indirect effect of the proposed turbines at Ascog would be Slight</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~27 km) and the proposed wind farm at Cour (10 km viewing distance) and the level of cumulative effect would remain as Slight.</p>
Open Upland Hills	<p>This LCT is located 32 km to the northeast of the nearest proposed turbine at its closest point. The sensitivity is high. Approximately 20% of the LCT is covered by the ZTV and affected areas are south-east facing slopes and summits such as Beinn Tharsuinn. Given the distance of view and the potential for intervening screening, the magnitude of change would be negligible overall and the level of indirect effect of the proposed turbines at Ascog would be Slight</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of Water head Moor proposed wind farm (at minimum viewing distances of ~25 km) and the level of cumulative effect would remain as Slight.</p>

7.6.8 Direct Effects on Landscape Designations

The proposed Ascog Wind Energy Project site is not designated at a national level although it is designated at a local level as an Area of Panoramic Quality (APQ). The APQ is illustrated on Figure 7.6a where it can be seen that the designated area extends to a total area of 321 km² which includes the whole of the Isle of Bute. The sensitivity of the locally designated landscape to wind farm development is medium on account of its medium landscape quality and value and low to moderate landscape capacity. The magnitude of landscape change as a result of the proposed Ascog Wind Energy Project would vary depending on distance from the turbines. Significant effects (very high and high magnitudes) would occur at distances of up to 800 m from the proposed turbines. Elsewhere the magnitude would vary between medium and zero and would be negligible overall. The level of effect overall would be **Slight/Negligible** and not significant.

7.6.9 Indirect Effects on Surrounding Landscape Designations

The assessment has considered the potential landscape effects on those landscape designations within 10 km of the proposed Ascog Wind Energy Project, in particular the North Ayrshire Sensitive Landscape Area.

Within the wider 10 to 35 km Study Area the assessment has included those receptors which are of national importance such as National Scenic Areas and National Parks.

The assessment set out in Table 7.10 considers the indirect effects on the visual character and integrity of the designated landscape within the Study Area, with particular emphasis on the potential effects on valued features and characteristics for which these areas are designated. In summary there would be no significant effect on any designated landscapes including the National Scenic Areas or the Loch Lomond and the Trossachs National Park.

Table 7.10: Indirect Effects on Designated Landscapes within the Surrounding Area

Landscape Designation	Description
<i>Landscape Designations within 10 km</i>	
North Ayrshire Sensitive Landscape Area.	Within 10 km of the proposed Ascog Wind Energy Project there are two instances of this designation: the mainland east of the application site and Great Cumbrae Island. The designated area is ~8 km from the nearest proposed turbine at its closest point. Given

Landscape Designation	Description
	<p>the local designation the sensitivity would be medium. Almost all of the designated area within 10 km of the application site is covered by the ZTV and the type of effect is illustrated in viewpoints 6, 8 and 9 (low to negligible magnitude). The magnitude of change would vary from low to zero and would be negligible overall. Given the distance of view, the level of effect of the proposed turbines at Ascog would be Slight/Negligible.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~6 km) and the level of cumulative effect would remain as Slight/Negligible.</p>
Kyles of Bute National Scenic Area	<p>This NSA is located 9 km to the northwest of the nearest proposed turbine at its closest point. The special qualities of the NSA relevant to the assessment are the juxtaposition of human settlement and a wider undeveloped landscape of sea and hills. The type of effect is illustrated in viewpoint 7 (negligible magnitude). ZTV coverage is limited and accounts for ~10% of the designated area and is concentrated on the northern shores of the Kyles around Colintraive. The sensitivity is high. Given the distance of view and the large unaffected areas, the level of effect of the proposed turbines at Ascog would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the other wind farms most relevant to the cumulative assessment and illustrated on Figure 7.10. Cruach Mhor (existing wind farm) would be at minimum viewing distances of ~5 km and the North Ayrshire schemes would be at minimum viewing distances of ~20 km and the level of cumulative effect would remain as Slight.</p>
National Landscape Designations within 10 to 35 km	
North Arran National Scenic Area	<p>This NSA is located 18 km to the southwest of the nearest proposed turbine at its closest point. The special qualities of the NSA relevant to the assessment are the distinctive profile of the mountain presence that dominates the Firth of Clyde. The sensitivity is high. Approximately 10% of the NSA within the LVSA is covered by the ZTV and affected areas are limited to coastal areas, north-east facing slopes and summits. The type of view is illustrated in viewpoints 18, 19 and 21 (negligible magnitude). Given the distance of view and the potential for intervening screening, the magnitude of</p>

Landscape Designation	Description
	<p>change would be negligible overall and the level of indirect effect of the proposed turbines at Ascog would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~20 km) and the proposed wind farm at Cour (10 km viewing distance) and the level of cumulative effect would remain as Slight.</p>
Loch Lomond National Scenic Area	<p>This NSA is located 32 km to the northeast of the nearest proposed turbine at its closest point. The sensitivity is high. Approximately 20% of the NSA within the LVSA is covered by the ZTV and affected areas are south-east facing slopes and summits such as Beinn Tharsuinn. Given the distance of view and the potential for intervening screening, the magnitude of change would be negligible overall and the level of indirect effect of the proposed turbines at Ascog would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of Water head Moor proposed wind farm (at minimum viewing distances of ~25 km) and the level of cumulative effect would remain as Slight.</p>
Loch Lomond and the Trossachs National Park	<p>The special qualities of the National Park relevant to the assessment are the wild and rugged highlands and distinctive mountain groups. The national park is ~20 km from the nearest proposed turbine at its closest point although this area of the national park (the Argyll Forest) is outside the ZTV. The “Loch Lomond” section of the national park is ~30 km from the nearest proposed turbine at its closest point in the north-eastern quadrant of the LVSA. The sensitivity is high. Less than 10% of the total National Park area within the LVSA is covered by the ZTV. Given the distance of view and the potential for intervening screening, the magnitude of change would be negligible overall and the level of indirect effect of the proposed turbines at Ascog would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of Waterhead Moor proposed wind farm (at minimum viewing distances of ~25 km) and the level of cumulative effect would remain as Slight.</p>

7.7 Predicted Impacts: Visual Impacts

The visual assessment draws from the ZTV, site visits and viewpoint analysis and assesses the potential visual effects on views and visual amenity likely to be experienced by receptors (people) within the landscape as follows:

- Visual Effects on Views from Settlements;
- Visual Effects on Views from Residential Properties;
- Visual Effects on Views from Transport Routes;
- Visual Effects on Views from Recreational Routes; and
- Visual Effects on Views from Recreational and Tourist Destinations.

7.7.1 Visual Effects on Views from Settlements

All settlements defined by the Argyll and Bute Local Plan Proposals Map within 5 km of the proposed Ascog Wind Energy Project have been included in the assessment. The sensitivity of residential receptors within settlements has been assessed as high and the assessment of visual effects on views from settlements is set out in Table 7.11.

There would be some limited significant visual effects on views from within the settlement of Rothesay as illustrated by Viewpoint 3 in Figure 7.15a/b. In all of these cases the visual effects would be experienced in the context of the wider visual amenity experienced from the settlements and it is not considered likely that any would be significantly affected in terms of their overall visual amenity or in a negative manner as relates to overshadowing, visual domination, or oppressiveness of properties or the public realm and related open spaces within settlements.

Cumulative visual effects as a result of other existing, consented, or planning application wind energy development would not be significant.

In all of these cases the visual effects would be experienced in the context of the wider visual amenity experienced from the settlements and it is not considered that any would be significantly affected in terms of their overall visual amenity or in a negative manner as relates to overshadowing, visual domination, or oppressiveness. There would be no effect on the living standards of settlements (including individual properties, the public realm and related open spaces within settlements) such that these would become unattractive places to live when judged objectively.

Drawing on the ZTVs, site visits, viewpoint analysis and the assessment of views from settlements; it is considered that there would be no significant effects on the views from settlements within the wider Study Area, between 5 km and 35 km distance from the proposed Development. Whilst the proposed Ascog Wind Energy Project may be visible from some locations over longer distances, it would appear as a distant feature.

Table 7.11: Visual Effects on Views from Settlements within 5 km

Settlement	Description of Effect
<p>Rothsay and Port Bannatyne</p>	<p>The settlement of Rothsay consists of the historic core/town centre located to the north-west of the proposed turbines. There are additional settlement areas arranged along the curving coastal strip: notably Ascog to the east of the application site but also including Craigmore to the north, Montford to the north-east, and West Bay, Ardbeg, and Port Bannatyne further to the north-west. There are also settlement areas of Rothsay which extend inland either side of the B881 and the B878 including Townhead and Ballochgoy to the west of the application site.</p> <p>The distance to the nearest proposed turbine from the settlement boundary is 400 m at its closest point which is the Ascog area to the east. Western parts of the settlement boundary are at 850m distance to the nearest proposed turbine. ZTV coverage of Rothsay is very limited due to intervening landform and would be further reduced by vegetation - in particular the blocks of deciduous woodland and coniferous forestry which are located around Roslin Road and Common Hill and screen potential views of blade tips from the valley and coast further west. Furthermore the built form within the settlement would reduce visibility. The town centre including the castle, museum and pier would all be unaffected in terms of views from ground level, as would be the cemetery to the south. Views of a short length of one blade tip would potentially occur from areas where there is little intervening built form such as the western edges of the playing fields, short sections of the Ardbeg coastal strip, and the vantage points along the tops of the castle walls but the magnitude of change would be negligible in all cases.</p> <p>The main area where there would be clear visibility of proposed turbine hubs is focused on the east facing slopes around Ballochgoy and the type of view is illustrated in Viewpoint 3: 2,051 m distance, medium magnitude. Additional visibility of hubs is predicted on short sections of two roads: the road by Roseland Caravan Site (900 m, medium to high magnitude) and on Hillhouse Road (2 km, medium to low magnitude). Significant effects would only occur in</p>

Settlement	Description of Effect
	<p>these aforementioned localised areas.</p> <p>Given the large areas within the settlement boundary which are outside the ZTV, the main focus of many views towards the sea (away from the development), and the level of vegetation screening, the magnitude of change for the settlement would be negligible and level of effect Slight and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be distant views of all the wind farms on the North Ayrshire Moorland Hills from certain areas, notably Ascog. Waterhead Moor would be visible from Ardbeg coastal strip. The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>

7.7.2 Visual Effects on Views from Residential Properties

Residential properties within 1 km of the proposed Ascog Wind Energy Project have been included in the assessment. The sensitivity of individual residential receptors has been assessed as high and the assessment of visual effects on views from settlements is set out in Table 7.12. The location of each property is shown in Figure 7.8 in Appendix F.

There would be significant visual effects on the views and visual amenity experienced from residents in eight properties as follows:

- Ascog Farm;
- High Bogany;
- Braeside;
- Beech Park;
- Duneastein;
- Single storey detached house;
- Whin Cottage; and
- Windyhall.

The nature of these effects would be indirect, long term (reversible), and neutral to negative. In all of these cases the visual effects would be experienced in the context of the wider visual amenity experienced from the properties and it is not considered likely that any would be significantly affected in terms of their overall visual amenity or in a negative manner as

relates to overshadowing, visual domination, or oppressiveness of properties including amenity spaces, access/egress and the adjacent highway. There would be no effect on the living standards within individual properties as a result of any predicted landscape or visual effects.

In all of these cases the visual effects would be experienced in the context of the wider property aspect and it is not considered that any of these properties would be significantly affected in terms of their overall visual amenity or in a negative manner as relates to overshadowing, visual domination, or oppressiveness. There would be no effect on the living standards such that any property would become an unattractive place to live when judged objectively.

There would be no significant effects on the views from residential properties and settlements within the wider Study Area (within 35 km distance from the proposed Ascog Wind Energy Project). Whilst the proposed Ascog Development may be visible from some locations over longer distances, it would appear as a distant feature.

Table 7.12: Visual Effects on Views from Residential Properties (within 2 km)

Residential Properties	Description of Effect
(1) Ascog Farm	<p>This medium to large sized 2.5 storey (1 floor in roof) traditional farmhouse is located 307 m to the south east of the proposed wind farm (the nearest visible turbine is T3) adjacent to the farm track. There are five small and four medium sized windows, plus a conservatory with a north west orientation towards the turbines. The main direct view from the property is to the west, with oblique views to the north west up to the Hill of Ascog and south west. This property is the most elevated of all assessed at ~50m AOD and the proposed turbines bases are at ~75-100m AOD. The top of the most elevated turbine is therefore ~174m AOD, thus the views toward the turbines would be upwards. There is very little garden and planting turbine side of the property.</p> <p>The wireframe illustrates that, between the farmhouse and the three turbines, the Hill of Ascog creates some screening of the bases of turbines 1 and 2. In reality there is very little additional screening by built structures and existing vegetation. There are a few existing single storey farm buildings within the field of view, but these are small by agricultural standards, ~15x8m and may create some additional screening.</p> <p>The turbines would occupy ~40° of the horizontal angle of view (AOV) and 14° of the vertical AOV, with their position at the top of the hill, the magnitude of</p>

Residential Properties	Description of Effect
	<p>change would be very high and the level of effect Substantial (significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be no views of other existing, consented, or proposed wind farms. In the absence of cumulative effects, the level of effect would remain as Substantial.</p>
(2) High Bogany	<p>Medium to large two storey detached farm house with long private drive off local road. The location is on a south-facing hillside, 414 m due north of turbine no. 1. The large farm house is orientated such that the main views from five medium sized windows are to the south-east, at an oblique angle to the proposed development. The southerly view towards the proposed development consists of a small, wooded hillside (Hill of Ascog) on the far side of a narrow valley. There is a sewage and water treatment works in the valley floor. Westerly views down the valley face towards the coast. Amenity areas to the north-east are partially insulated by the house itself and a low planting strip. The conservatory against the north-east elevation is not orientated towards the application site although views may occur from here.</p> <p>The horizontal AOV affected is relatively small: 5°; as a result of the three turbines overlapping. The vertical AOV, however, is 7.5° and the full height of turbine no.1 would appear prominently at the top of the small hill to the south. The turbines would appear in the same field of view as the distinctive Arran skyline (Goat Fell) but they would not obscure any views, appearing against the horizon.</p> <p>Given the vertical AOV affected and the scale of the turbines relative to the landform beneath them, the magnitude of change would be high and the level of effect Substantial (significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be no views of other existing or consented wind farms. Waterhead Moor proposed wind farm would theoretically be visible at a distance of ~14 km causing a negligible magnitude of change when considered independently. The level of cumulative effect would remain as Substantial.</p>
(3) Braeside	<p>Large two storey detached farm house set back from local road. The location is on a south-facing hillside, 436 m west of the nearest proposed turbine no. 1. The house is orientated such that the main views from ten medium sized windows are to the south-east, directly towards the proposed development. There are amenity areas to the north, south and east elevations. Parking is to</p>

Residential Properties	Description of Effect
	<p>the east. There would be clear views of the proposed development from the house and all amenity areas apart from the northern garden which would be screened by the house. Two mature trees on the eastern curtilage would provide partial screening to access/egress and the highway.</p> <p>The horizontal AOV affected is 45° with the three turbines appearing against the horizon, evenly spaced across the Hill of Ascog. The vertical AOV is 10°. For these reasons, and considering the direct nature of the view, the magnitude of change would be high and the level of effect Substantial (significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be no views of other existing or consented wind farms. Waterhead Moor proposed wind farm would theoretically be visible at a distance of ~14 km causing a negligible magnitude of change when considered independently. The level of cumulative effect would remain as Substantial.</p>
(4) Beech Park	<p>Single storey detached farm house with courtyard accessed via a private track. The location is slightly elevated, on an south-east-facing hillside, 467 m south-east of the nearest proposed turbine no. 3. The house is orientated such that the main views are to the south, east and west, and any views of the proposed development would be at an oblique angle. There are amenity areas to the south. A private track providing access and egress is to the north.</p> <p>Clear views of the proposed development will occur in isolated areas including the access/egress and there would be significant effects in these locations. There is substantive screening including a 2m high stone wall and beech hedgerow and significant effects would be limited and would not occur from the property itself.</p> <p>The horizontal AOV affected is 15° with the three turbines appearing against the horizon, across the Hill of Ascog. Turbines 2 and 3 partially overlap. The vertical AOV is 10° with partial screening of the turbine bases by landform. Considering the oblique nature of the view from the house and the levels of screening, the magnitude of change would be medium and the level of effect Moderate/Substantial (significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13.5 km). However, all easterly views towards the mainland would be screened by vegetation and the level of cumulative effect would remain as Moderate/Substantial.</p>

Residential Properties	Description of Effect
(5) Duneastein	<p>This medium sized single storey property is a detached bungalow with private access drive located 484 m to the west of the nearest proposed turbine (T1). The location is elevated and open. There is little screening and potentially there would be direct views of the proposed wind farm at close range from the house and grounds.</p> <p>The horizontal AOV affected is 45° with the three turbines appearing against the horizon, evenly spaced across the Hill of Ascog. The vertical AOV is 10°. For these reasons, and considering the direct nature of the view, the magnitude of change would be high and the level of effect Substantial (significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be no views of other existing, consented, or proposed wind farms. In the absence of cumulative effects, the level of effect would remain as Substantial.</p>
(6) Balmory House	<p>Very large three storey detached house with private driveway off Balmory Road set within own grounds. . Large garden with mature vegetation on all sides. The location is slightly elevated, on the east-facing hillside, 499 m south-east of the nearest proposed turbine no. 3. The house is orientated such that the main views are to the east across the Firth of Clyde.</p> <p>Clear views of the proposed development would not occur from the house, grounds, access, egress or from the highway due to intervening mature vegetation. Any views would be filtered and would only occur from isolated areas</p> <p>The theoretical horizontal AOV affected is 18° with the three turbines appearing against the horizon, across the Hill of Ascog with partial screening of the turbine bases by landform. Considering the main orientation of the views from the house and grounds and the levels of screening, the magnitude of change would be low and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13.5 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(7) Stevenson Lodge	<p>Medium sized two storey semi-detached house set on an east-facing hillside. The location is 520 m to the north-east of the nearest turbine (T1). The hillside</p>

Residential Properties	Description of Effect
	<p>to the south-west would obscure parts of the proposed development, and any direct views would consist of one blade tip and the upper parts of one turbine including the hub. The main view from the property is northwards, in the opposite direction the application site. There is partial screening to southerly views as a result of low garden planting.</p> <p>The theoretical horizontal AOV affected is 15° with parts of two turbines appearing against the horizon, across the Hill of Ascog. Considering the main orientation of the views from the house and intervening landform to the south, the magnitude of change would be low and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13.5 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(8) Balmory Cottage	<p>Medium sized two storey detached house with a small to medium sized garden set amongst substantive mature vegetation. The location is slightly elevated, on an south-east-facing hillside, 531 m south-east of the nearest proposed turbine no. 3. The house is orientated such that the main views are to the east, and any views of the proposed development would be heavily filtered by mature vegetation. A minor road providing access and egress is to the north.</p> <p>The horizontal AOV affected is 14° with the three turbines appearing against the horizon, across the Hill of Ascog. Considering the orientation of the main view from the house and the levels of screening, the magnitude of change would be low and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13.5 km). However, all easterly views towards the mainland would be screened by vegetation and the level of cumulative effect would remain as Slight.</p>
(9) Gatehouse style house to Balmory House	<p>Small, single storey, stone built detached house set in the grounds of Balmory House with access routes to the immediate north and south. The location is 553 m south-east of the nearest proposed turbine no. 3. The location is slightly elevated, but visually well insulated due to mature vegetation. Any views from the northern elevation would be at an oblique angle. There would be no view of</p>

Residential Properties	Description of Effect
	<p>turbine 1</p> <p>The theoretical horizontal AOV affected is 24° with the three turbines appearing against the horizon, across the Hill of Ascog. However, it is likely that turbine t1 would be completely screened by the trees to the north. The remaining two turbines would potentially appear above the intervening vegetation as blade tips or, in winter months, as hubs and blade tips. Considering the orientation of the main view from the house and the levels of screening, the magnitude of change would be low and the level of effect Slight (not significant in terms of the EIA regulations). There would be isolated significant effects in winter months. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13.5 km). However, all easterly views towards the mainland would be screened by vegetation and the level of cumulative effect would remain as Slight.</p>
(10) Seasgair	<p>Medium sized two-storey, traditional stone and slate detached house set within own grounds. The location is 568 m to the north-east of the nearest turbine (T1). The hillside to the south-west would obscure most parts of the proposed development, and any direct views would consist of the upper parts of one turbine including the hub. The main view from the property is eastwards. There is partial screening to southerly views as a result of low garden planting. Considering the main orientation of the views from the house and intervening landform to the south, the magnitude of change would be low and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of Waterhead Moor, Kelburn Estate and Dalry on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13.5 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(11) Single storey detached house	<p>Medium to large sized one and one and half storey detached house with a medium sized garden. There is little surrounding vegetation. The location is slightly elevated, on a south-east-facing hillside, 586 m south-east of the nearest proposed turbine no. 3. The house is orientated such that the main views are north-south although with the Firth of Clyde potentially visible to the east from a conservatory or from the external areas. A minor road providing access and egress is to the west.</p>

Residential Properties	Description of Effect
	<p>The horizontal and vertical AOVs affected are both 8° with the three turbines partially overlapping. Considering the potential for direct views from the most used rooms of the main view from the house and the levels of screening, the magnitude of change would be medium and the level of effect Moderate/Substantial (significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13.5 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Moderate/Substantial.</p>
(12) Southpark	<p>Large Georgian style detached house set amongst grounds including lawns on the esplanade beside the Firth of Clyde. The location is 632 m south-east of the nearest proposed turbine no. 3. The main orientation is to the east across the Firth. The house, grounds, access/egress and the highway are all well insulated due to mature vegetation and landform to the west. Any views of the turbines would be heavily filtered and would be at an oblique angle to the northern and western elevations.</p> <p>The theoretical horizontal AOV affected is 24° with the three turbines appearing against the horizon, across the Hill of Ascog. However, it is predicted that there would be filtered views of blade tips from isolated locations in winter months only due to the level of deciduous tree cover. Considering the orientation of the main view from the house and the levels of screening, the magnitude of change would be low to negligible and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13.5 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(13) Tareside	<p>Very large two storey stone detached house set back (south) from A844. ~1.2m high stone wall forms garden boundary. The location is 642 m to the east of the nearest turbine (T2). The hillside to the west would obscure the lower parts of the proposed development, and vegetation on the hillside to the west would screen the remainder of the turbines. There are amenity spaces adjacent to the north and south elevations but vegetation in the neighbouring property including mature trees would limit views towards the application site. The main</p>

Residential Properties	Description of Effect
	<p>orientation of the house is northwards across Ascog Bay towards Ben Ruadh and this elevation would be unaffected. There may be direct filtered views of blade tips from the gable-end and from isolated external locations. Oblique views (greater than 45°) may occur from southern elevation. Views would consist of blade tips only in summer and filtered views of upper parts would occur in winter months.</p> <p>Considering the main orientation of the views from the house and intervening landform and vegetation to the west, the magnitude of change would be negligible and the level of effect Negligible (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.25 km). In reality eastern views from the property are screened by vegetation and built form although filtered views in this and would occur from the highway. The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Negligible.</p>
(14) Newly built detached house	<p>One to one and a half storey medium to large detached house off access track set within its own grounds. There is a medium sized garden. The position is elevated at the top of a hill. The nearest turbine (T1) is located 643 m to the south-west of the property. There is sufficient intervening vegetation to obscure southerly views towards the proposed development. There may be filtered views of blade tips of two turbines in winter months. The main view is eastwards across the Firth of Clyde.</p> <p>Considering the main orientation of the views from the house and intervening landform and vegetation to the south-west, the magnitude of change would be negligible and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of Waterhead Moor, Kelburn Estate, and Dalry on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.5 km). In reality, only Waterhead Moor would be visible due to vegetation screening. The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Negligible.</p>

Residential Properties	Description of Effect
(15) Invergyle Cottage	<p>Medium sized two storey detached house set back (south) from A844. The location is 667 m to the east of the nearest turbine (T2). The hillside to the west would obscure the lower parts of the proposed development, and vegetation on the hillside to the west would screen the remainder of the turbines. There are amenity spaces adjacent to the north and south elevations but vegetation including mature trees would limit views towards the application site. The main orientation of the house is northwards across Ascog Bay and this elevation would be unaffected. There may be direct filtered views of blade tips from isolated external locations. Oblique views (greater than 45°) may occur from southern elevation. Views would consist of blade tips only in summer and filtered views of upper parts would occur in winter months.</p> <p>Considering the main orientation of the views from the house and intervening landform and vegetation to the west, the magnitude of change would be negligible and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.25 km). In reality eastern views from the property are screened by vegetation and built form although filtered views in this and would occur from the highway. The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(16) Lodge to Railway Convalescent Home	<p>Medium sized detached house single storey positioned on the esplanade beside the A844 and the Firth of Clyde. The location is 670 m east of the nearest proposed turbine no. 3. Despite its position relative to the sea, the main views from the house are to the north, west and south, and there is a small garden to the north. The house, grounds, access/egress and the highway are all well insulated due to mature vegetation and landform to the west. Any views of the turbines would be heavily filtered. Turbine one would be potentially visible at an oblique angle to the north and west elevations although views would consist of the upper parts only.</p> <p>Considering the levels of screening, the magnitude of change would be low and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire</p>

Residential Properties	Description of Effect
	Moorland Hills (at minimum viewing distances of ~13.5 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight .
(17) Seal Lodge	<p>Medium sized detached house over one and half storeys positioned on the esplanade beside the A844 and the Firth of Clyde. The location is 674 m east of the nearest proposed turbine no. 3. Despite its position relative to the sea, the main views from the house are to the north, west and south, and there are medium sized gardens to these elevations. The house, grounds, access/egress and the highway are all well insulated due to mature vegetation and landform to the west. Any views of the turbines would be heavily filtered.</p> <p>It is predicted that there would be filtered views of blade tips from isolated locations in winter months only, due to the level of deciduous tree cover.</p> <p>Considering the levels of screening, the magnitude of change would be low and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13.5 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(18) Burnside Cottage	<p>Traditional, compact one and half storey stone and slate property located, as the name suggests, on the side of Ascog burn. The land slopes downwards to the south into the burn and towards a dead-end track. The main orientation is eastwards. The location is 675 m to the east of the nearest proposed turbine (T1). There is sufficient intervening vegetation including conifers to the immediate south-west to ensure that any views would be limited to blade tips only. Only one turbine would be partially visible.</p> <p>Considering the main orientation of the views from the house and intervening landform and vegetation to the south-west, the magnitude of change would be negligible and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of Waterhead Moor, Kelburn Estate, and Dalry on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.5 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>

Residential Properties	Description of Effect
(19) Holiday let apartments	<p>Five star Scottish Tourist Board self-catering accommodation. The original house is a two storey medium sized detached traditional stone property. The apartments are two storey medium to large buildings. All are located on a steep slope which faces northwards and eastwards. The nearest turbine (T1) is located 683 m to the south-west of the property. There is sufficient intervening vegetation to obscure southerly views towards the proposed development. There may be filtered views of blade tips of two turbines in winter months. The main views are eastward across the Firth of Clyde.</p> <p>Considering the main orientation of the views from the house and intervening landform and vegetation to the south-west, the magnitude of change would be negligible and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.5 km). In reality, only Waterhead Moor would be visible due to vegetation screening. The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(20) Single storey lodge style house	<p>Small single storey stone and slate lodge style detached property on slope facing north and east. There is a small garden and a conservatory on the south side of the house. The nearest turbine (T1) is located 719 m to the south-west of the property. There is sufficient intervening vegetation to obscure southerly views towards the proposed development. The main views are eastward across the Firth of Clyde.</p> <p>Considering the main orientation of the views from the house and intervening landform and vegetation to the south-west, the magnitude of change would be negligible and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.5 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>

Residential Properties	Description of Effect
(21) Derelict Place of Worship for sale	Uninhabited.
(22) Tyrone Cottage & Stella Matutura	<p>2 single storey semi-detached properties fronting on to the A844 and backing on to the Firth of Clyde. The location is 731 m to the east of the nearest turbine (T1). The substantive vegetation to the west would screen the turbines from all areas including the highway. There are amenity spaces adjacent to the eastern elevation but these would be unaffected.</p> <p>Considering the main orientation of the views from the house and intervening landform and vegetation to the west, the magnitude of change would be zero and the level of effect None (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would increase to Slight.</p>
(23) Hawkstone	<p>Medium sized two storey detached house set amongst grounds including lawns on the esplanade beside the Firth of Clyde and the A844. The location is 745 m south-east of the nearest proposed turbine no. 3. The main orientation is to the east across the Firth. The house, grounds, access/egress and the highway are all very well insulated due to mature perimeter vegetation and landform to the west. Any views of the turbines would be heavily filtered and would consist of the blade tips only.</p> <p>Considering the orientation of the main view from the house and the levels of screening, the magnitude of change would be negligible and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(24) The Boat House	Small single storey detached house set seaward side of A844 at a lower level to the road. The shoreside location is 746 m to the east of the nearest turbine (T2). The hillside to the west would obscure the lower parts of the proposed development, and vegetation on the hillside would screen the remainder of the

Residential Properties	Description of Effect
	<p>turbines. There is a small amenity spaces adjacent to the north elevation but a belt of mature trees to the immediate west would limit views towards the application site. The main orientation of the house is northwards across Ascog Bay and this elevation would be unaffected. There may be direct filtered views of blade tips from isolated external locations and from the gable end. Views would consist of blade tips only in summer and filtered views of upper parts would occur in winter months.</p> <p>Considering the main orientation of the views from the house and intervening landform and vegetation to the west, the magnitude of change would be negligible and the level of effect Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(25) Whin Cottage	<p>Single storey property located at the end of a private track and facing eastwards towards the Firth of Clyde. Property located 777 m north of the nearest proposed turbine (T1). Property not visited and therefore assessed using aerial photography only. The proposed development would appear above intervening vegetation to the south and only the upper parts would be visible. Any views from the eastern elevation would be oblique but from the southern elevation they would be direct. There would be clear views from access/egress. The magnitude of change would be medium and the overall level of effect would be Moderate/Substantial and significant in terms of the EIA regulations. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Moderate/Substantial.</p>
(26) 45 Craigmore Road	<p>Part of a project of properties located adjacent to the A844 on the esplanade and facing eastwards towards the Firth of Clyde. Single storey property located 786m to the north-east of the nearest proposed turbine. The proposed development would be largely screened due to intervening landform and</p>

Residential Properties	Description of Effect
	<p>vegetation including trees in Ascog Burn. In isolated locations with clear southerly views one blade tip would be visible and the level of effect would be Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(27) Windyhall	<p>Large two storey detached house set in own grounds with long private drive. The house is in an elevated position with potential panoramic views although it is surrounded by outbuildings. The main elevation and amenity space are to the east, facing directly towards the application site and any views in this direction would be slightly filtered by garden vegetation. The nearest proposed turbine (T3) is 791 m from the house.</p> <p>Given the potential for clear and open views of the proposed wind farm the magnitude of change would be high and the level of effect Moderate/Substantial (significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical simultaneous visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~14 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Moderate/Substantial.</p>
(28) 43-44 Craigmore Road	<p>Part of a project of properties located adjacent to the A844 on the esplanade and facing eastwards towards the Firth of Clyde. Semi-detached two-storey property located 795 m to the north-east of the nearest proposed turbine. The proposed development would be largely screened due to intervening landform and vegetation including trees in Ascog Burn. In isolated locations with clear southerly views (e.g. from the upper stories) one blade tip would be visible and the level of effect would be Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>

Residential Properties	Description of Effect
(29) 1-4 Montford Terrace	<p>Part of a project of properties located adjacent to the A844 on the esplanade and with the principal views facing eastwards towards the Firth of Clyde. 4 terraced two-storey properties located 805 m to the north-east of the nearest proposed turbine. The proposed development would be largely screened due to intervening landform and vegetation including trees in Ascog Burn. In isolated locations with clear southerly views (e.g. from the upper stories) one blade tip would be visible and the level of effect would be Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(30) 40-42 Craigmore Road	<p>Part of a project of properties located adjacent to the A844 on the esplanade and facing eastwards towards the Firth of Clyde. Semi-detached two-storey property located 823 m to the north-east of the nearest proposed turbine. The proposed development would be largely screened due to intervening landform and vegetation including trees in Ascog Burn. In isolated locations with clear southerly views (e.g. from the upper stories) one blade tip would be visible and the level of effect would be Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
(31) Grafton	<p>Part of a project of properties located adjacent to the A844 on the esplanade and facing eastwards towards the Firth of Clyde. Single storey property located 829 m to the north-east of the nearest proposed turbine. The proposed development would be completely screened due to intervening landform and vegetation and the houses at Montford Terrace opposite. The level of effect would be None (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of</p>

Residential Properties	Description of Effect
	~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would increase to Slight .
(32) Mid Ascog	<p>Medium to large sized two storey detached farmhouse with a medium sized lawned garden to the east and outbuildings to the west. There is a minor road to the north. There is a mature tree near the house to the north. The location is elevated, on a south-east-facing hillside, 839 m south of the nearest proposed turbine no. 3. The house is orientated such that the main views are eastwards. The horizontal AOVs affected are relatively narrow with the three turbines partially overlapping. The vertical AOV would, however, mean that the turbines would be prominent new development on the hill to the north. Whilst there would be no significant effects to the main views from the house, there would be significant effects when viewing northwards from the access/egress, highway and the garden. The magnitude of change would be medium and the level of effect Moderate (significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There would be theoretical visibility of all the wind farms on the North Ayrshire Moorland Hills (at minimum viewing distances of ~13.5 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Moderate.</p>
(33) 36-39 Craigmore Road	<p>Part of a project of properties located adjacent to the A844 on the esplanade and facing eastwards towards the Firth of Clyde. Semi-detached two-storey properties located 860 m to the north-east of the nearest proposed turbine. The proposed development would be largely screened due to intervening landform and vegetation including trees in Ascog Burn. In isolated locations with clear southerly views (e.g. from the upper stories) one blade tip would be visible and the level of effect would be Slight (not significant in terms of the EIA regulations). The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Negligible.</p>
(34) Detached house with solar panels	<p>Medium sized single storey detached property located at the end of a private track and set back from the local road. Elevated location on hillside with the main angle of view from the property facing eastwards towards the Firth of Clyde. Property located 882 m north of the nearest proposed turbine (T1). The</p>

Residential Properties	Description of Effect
	<p>proposed development would be clearly visible to the south but this is not the main view. There would be significant effects to southerly views but the overall magnitude of change would be low and the overall level of effect would be Moderate and not significant in terms of the EIA regulations. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Moderate.</p>
(35) Ardrannan	<p>Medium sized one and half storey detached property located at the end of a private track. Elevated location on hillside with the main angle of view from the property facing eastwards towards the Firth of Clyde. Property located 915 m north of the nearest proposed turbine (T1). The proposed development would appear in southerly views but would be partially filtered by surrounding vegetation. There would be significant effects to southerly views but the overall magnitude of change would be low and the overall level of effect would be Moderate and not significant in terms of the EIA regulations. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13.2 km). The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Moderate</p>

7.7.3 Visual Effects on Views from Main Transport Routes

This Section of the assessment considers the visual effects on views from the main transport routes within the Study Area (as listed in Table 7.13). The views from these routes would be experienced transiently by road users and the sensitivity of these receptors is considered to be medium. Each of these routes was driven in both directions to assess the potential effects and the assessment has been assisted with the use of sequential wireframes and ZTV maps. Those routes outside the ZTV have not been included in the assessment.

Significant visual effects on views from roads could be experienced from short sections of the A844, B881 and the B878, whilst passing closest to the proposed Ascog Wind Energy Project within approximately 1.4 km to 1.6 km from the proposed turbines.

Table 7.13: Visual Effects on Views from Transport Routes

Route	Description of Effect
'A' Class roads within 5 km	
A844	<p>The A844 follows the mostly coastal route around the Isle of Bute (medium sensitivity). The route is 35.4 km in length and is 570m from the nearest proposed turbine at its closest point.</p> <p>ZTV coverage accounts for ~28% of the total route length. The location at Mount Stewart is illustrated in Figure 7.14: zero magnitude. Head on views would occur in two isolated locations: Ascog Bank (1.5 km, medium to high magnitude) and Ardbeg (3.3 km, negligible magnitude). The magnitude of change would range from zero to high and the level of effect overall would be Slight/Negligible and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The affected areas are already within the ZTV of the existing, consented and application wind farms on the North Ayrshire Moorland Hills. The level of effect would be slight/negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight/Negligible.</p>
A886	<p>The A886 from Strachur to Port Bannatyne is 43.5 km in length. It follows a mostly coastal route and includes a ferry crossing at Colintrave. The route is of medium sensitivity. The route is 3.5 km from the proposed Ascog Wind Energy Project at its closest point and is overlapped by the ZTV for a 1.3 km section only and this location on the approach to Kames Bay would be affected by views of 10m blade length at viewing distances of beyond 5 km (negligible magnitude). The magnitude of change would range from zero to negligible and the level of effect overall would be Slight/Negligible and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The affected areas are already within the ZTV footprints of the existing, consented, and application wind farms on the North Ayrshire Moorland Hills. The level of effect would be slight/negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight/Negligible.</p>
A815	<p>The A815 from Cairndow to Toward is 57.5 km in length, 20 km of the route is within the LVSA. It follows a coastal route between Toward and Dunoon and Ardbeg and then cuts across the Cowal peninsula. The route is of medium sensitivity. The route is 5 km from the proposed Development at its closest point and is overlapped by the ZTV for a total of 2 km only. Viewpoint 4</p>

Route	Description of Effect
	<p>(negligible magnitude) illustrates the type of view available from the southerly end of the route at the closest point to the proposed turbines. The overall magnitude of change would range from zero to negligible and the level of effect overall would be Slight/Negligible and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The affected areas are already within the ZTV footprint of existing and application wind farms on the North Ayrshire Moorland Hills. The viewing distance to the closest existing wind farm would be 17 km, and to the closest other application wind farm would be 12 km (Waterhead Moor). The level of effect would be slight/negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight/Negligible.</p>
A78	<p>The A78 from Greenock to Monkton is 65.3 km in length; most of the route is within the LVSA. The A78 follows a coastal route along the Firth of Clyde linking Wemyss Bay, Largs, West Kilbride, Ardrossan and Irvine. The route is of medium sensitivity. The route is 9 km from the proposed Ascog Wind Energy Project at its closest point. ZTV coverage accounts for a total of 13 km and is concentrated on the coastal section between Inverkip and Largs. Viewpoints 8 and 11 (negligible magnitude) illustrate the type of view available from the route. The overall magnitude of change would range from zero to negligible and the level of effect overall would be Slight/Negligible and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>Existing and consented wind farms on the North Ayrshire Moorland Hills cause an overall Slight/Negligible level of effect on the route. The viewing distance to the closest existing wind farm would be 2 km (Ardrossan), and isolated significant effects would occur in relation to this wind farm affecting ~1 km of the overall route length. Application wind farms would also contribute a Slight/Negligible level of effect.</p> <p>The overall cumulative effect would remain as Slight/Negligible and the addition of Ascog would not be significant.</p>
'B' Class Roads within 10 km	
B881	<p>The B881 from Rothesay to Ambrismore is 7 km in length, all of the route is within the LVSA and ZTV coverage accounts for ~80% of the total route length. The route heads south west across the island of Bute from Rothesay, it passes the reservoirs of Loch Ascog, Loch Fad, and Loch Quien. The route is of medium sensitivity. The route is 1.4 km from the proposed Ascog Wind Energy Project at its closest point. Viewpoint 5 (negligible magnitude) illustrates the</p>

Route	Description of Effect
	<p>type of view available from the southerly end of the route. The magnitude of change would range from zero to high and the level of effect overall would be Slight/Negligible and not significant, although significant effects would occur along ~1 km of the route length when travelling northwards. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The affected areas are mostly outside the ZTV footprint of existing, consented and application wind farms. However, on the higher ground around Lochend there would be simultaneous long distance views of other developments on the North Ayrshire Moorland Hills. The level of effect would be slight/negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight/Negligible.</p>
B878	<p>The B878 from Rothesay to Ambrismore is 3.2 km in length, all of the route is within the LVSA and ZTV coverage accounts for ~65% of the total route length. The route heads west across the island of Bute from Rothesay. The route is of medium sensitivity. The route is 1.6 km from the proposed Ascog Wind Energy Project at its closest point. Viewpoint 3 (medium magnitude) illustrates the type of view available from the easterly end of the route. The magnitude of change would range from zero to high and the level of effect overall would be Slight/Negligible and not significant, although significant effects would occur along ~0.5 km of the route length when travelling eastwards. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The affected areas are mostly outside the ZTV footprint of existing, consented and application wind farms. However, on the higher ground around Little Barone there would be simultaneous long distance views of other developments on the North Ayrshire Moorland Hills. The level of effect would be slight/negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight/Negligible.</p>
B875	Outside ZTV.
B896	<p>The B896 around the Great Cumbrae Island is 15.9 km in length, all of the route is within the LVSA and ZTV coverage accounts for ~45% of the total route length. The route is of medium sensitivity. The route is 8 km from the proposed Ascog Wind Energy Project at its closest point. Viewpoint 6 (negligible magnitude) illustrates the type of view available from the route. The magnitude of change would range from zero to negligible and the level of effect overall would be Slight/Negligible and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p>

Route	Description of Effect
	<p><u>Cumulative Assessment</u></p> <p>The affected areas are mostly outside the ZTV footprint of existing, consented and application wind farms and cumulative visibility of existing, consented and application schemes is generally concentrated on the eastern side of the island. However, on the north of Cumbrae around Tomont End there would be sequential views of other developments on the North Ayrshire Moorland Hills. Although these schemes are at minimum viewing distances of ~6 km, they are generally only partially visible. The level of effect would be slight/negligible for each individual scheme, rising to slight for the group and the level of cumulative effect would increase to Slight/Negligible.</p>
Single Track Roads within 10 km	
Toward Point to Inverchaolain	<p>The track is 10 km in length and is entirely within the LVSA. It follows a coastal route between Toward on the southern tip of the Cowal peninsular and Inverchaolain on the western edge. The route is of medium sensitivity. The route is 4.5 km from the proposed Ascog Wind Energy Project at its closest point and is overlapped by the ZTV for ~90% of its total length. Viewpoint 4 (negligible magnitude) illustrates the type of view available from the southerly end of the route at the closest point to the proposed turbines. The overall magnitude of change would range from zero to negligible and the level of effect overall would be Slight/Negligible and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The affected areas are mostly outside the ZTV footprint of existing, consented and application wind farms and cumulative visibility of existing, consented and application schemes is generally concentrated on the southern tip of the peninsular. The viewing distance to the closest existing wind farm would be 17 km, and to the closest other application wind farm would be 12 km (Waterhead Moor). The level of effect would be slight/negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight/Negligible.</p>
'A' Class Roads within 10 to 35 km	
A770	<p>The A770 from Greenock to Inverkip is 12.9 km in length and all of the route is within the LVSA. The A770 follows a coastal route along the Firth of Clyde. The route is of medium sensitivity. The route is 15 km from the proposed Ascog Wind Energy Project at its closest point. ZTV coverage accounts for a total of 3.5 km and is concentrated on the coastal section between Inverkip and Cloch Point. Viewpoint 14 (negligible magnitude) illustrate the type of view available from the route. The overall magnitude of change would range from zero to</p>

Route	Description of Effect
	<p>negligible and the level of effect overall would be Slight/Negligible and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The affected areas are mostly outside the ZTV footprint of existing, consented and application wind farms and the level of cumulative effect would remain as Slight/Negligible.</p>
A841	<p>The A841 from Lochranza to Largymore on the Isle of Arran is 33.8 km in length, ~90% of the route is within the LVSA and ZTV coverage accounts for 10 km of the total route length. The route is of medium sensitivity. The route is 20 km from the proposed Development at its closest point. Viewpoint 19 (negligible magnitude) illustrates the type of view available from the route. The magnitude of change would range from zero to negligible and the level of effect overall would be Slight/Negligible and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The affected areas are already within the ZTV of the existing, consented and application wind farms on the North Ayrshire Moorland Hills. The minimum viewing distance would be 20 km. The level of effect would be slight/negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight/Negligible.</p>

7.7.4 Visual Receptors: Ferry Routes

This Section of the assessment considers the visual effects on views from the main ferry routes within the Study Area (as listed in Table 7.14). The views from these routes would be experienced by travellers and visitors and the sensitivity of these receptors is considered to be high to medium. Both directions of travel have been assessed and the assessment has been assisted with the use of sequential wireframes and ZTV maps. Those routes outside the ZTV have not been included in the assessment.

Significant visual effects on views from ferry routes could be experienced from part of the Bute: Wemyss Bay to Rothesay route occurring along approximately 2 km of the route length near Bogany Point with the ferry route coming to within 1.7 km of the proposed turbines.

Table 7.14: Visual Effects on Views from Ferry Routes

Route	Description of Effect
<i>Firth of Clyde Routes</i>	
Gourock to Dunoon	<p>The 7 km crossing is overlapped for ~2.5 km by ZTV coverage. The route is of high sensitivity and is 17 km from the proposed Ascog Wind Energy Project at its closest point. Viewpoint 17 (negligible magnitude) illustrates the type of view available from the route. The magnitude of change would range from zero to negligible and the level of effect overall would be Slight and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The western half of the route would experience cumulative effects in association with the existing, consented and application wind farms on the North Ayrshire Moorland Hills. The minimum viewing distance would be 15 km. The level of effect would be slight for each individual cumulative scheme and when considered as a group and the level of cumulative effect would remain as Slight.</p>
Gourock (McInroy's Point) to Dunoon (Hunter's Quay)	<p>The 4.2 km crossing is overlapped for ~1.7 km by ZTV coverage. The route is of high sensitivity and is 17 km from the proposed Ascog Wind Energy Project at its closest point. Viewpoint 17 (negligible magnitude) illustrates the type of view available from the route. The magnitude of change would range from zero to negligible and the level of effect overall would be Slight and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The western half of the route would experience cumulative effects in association with the existing, consented and application wind farms on the North Ayrshire Moorland Hills. The minimum viewing distance would be 15 km. The level of effect would be slight for each individual cumulative scheme and when considered as a group and the level of cumulative effect would remain as Slight.</p>
Bute: Wemyss Bay to Rothesay	<p>The 11.5 km crossing is overlapped for ~9 km by ZTV coverage. The route is of high sensitivity and is 1.7 km from the proposed Ascog Wind Energy Project at its closest point. Viewpoint 10 (low magnitude) illustrates the type of view available from the eastern portion of the route. The magnitude of change would range from zero to medium and the level of effect overall would be Moderate and not significant although significant effects would occur along ~2 km of the route length near Bogany Point. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p>

Route	Description of Effect
	<p>The route would experience cumulative effects in association with the existing, consented and application wind farms on the North Ayrshire Moorland Hills. The minimum viewing distance would be ~8 km. The level of effect would be slight for each individual cumulative scheme and when considered as a group and the level of cumulative effect would remain as Moderate.</p>
Cumbræ: Largs to Cumbræ Slip	<p>The 2.1 km crossing is overlapped for ~1.5 km by ZTV coverage. The route is of high sensitivity and is 10 km from the proposed Ascog Wind Energy Project at its closest point. Viewpoint 11 (low to negligible magnitude) illustrates the type of view available from the eastern extents of the route. The magnitude of change would range from zero to low to negligible and the level of effect overall would be Slight and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The route would experience cumulative effects in association with existing and application wind farms on the North Ayrshire Moorland Hills. The minimum viewing distance would be 4.3 km to Waterhead Moor and 6.3 km to Kelburn Estate. The level of effect would be slight for each individual cumulative scheme and when considered as a group and the level of cumulative effect would remain as Slight.</p>
Arran: Ardrossan to Brodick	<p>The 21 km crossing is overlapped for ~13 km by ZTV coverage. The route is of high sensitivity and is 24 km from the proposed Development at its closest point. The magnitude of change would range from zero to negligible and the level of effect overall would be Slight and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p> <p><u>Cumulative Assessment</u></p> <p>The route would experience cumulative effects in association with the existing, consented and application wind farms on the North Ayrshire Moorland Hills. The minimum viewing distance would be 4 km to Ardrossan wind farm. The level of effect would be slight for each individual cumulative scheme and when considered as a group and the level of cumulative effect would remain as Slight.</p>
Kilbrannan Sound Route	
Arran: Claonaig to Lochranza	<p>The 7 km crossing is overlapped for ~90% of its total length by ZTV coverage. The route is of high sensitivity and is 21 km from the proposed Ascog Wind Energy Project at its closest point. The magnitude of change would range from zero to negligible and the level of effect overall would be Slight and not significant. The type of effect would be long term (reversible), indirect, and neutral to negative.</p>

Route	Description of Effect
	<p><u>Cumulative Assessment</u></p> <p>The route would experience cumulative effects in association with other existing, consented and application wind farms, notably Cour proposed wind farm. The minimum viewing distance would be 12 km to Cour wind farm, other schemes are at viewing distances of greater than 30 km. The level of effect would be slight for each individual cumulative scheme and when considered as a group and the level of cumulative effect would remain as Slight.</p>

7.7.5 Visual Receptors: Recreational Routes

The visual assessment on views from recreational routes is set out in Table 7.15 and has considered the potential visual effects likely to be experienced by people (walkers/cyclists/horse riders/joggers) on recreational routes within the Study Area.

7.7.6 Local Recreational Routes including Adopted Core Paths and Sailing/Kayaking Routes and Launching Points

At a local level the assessment has considered the views from local recreational routes within 5 km of the proposed Ascog Wind Energy Project and includes the Core Path Network sourced from the Argyll and Bute Finalised Core Path Plan (2011) which is partly illustrated in Figure 7.6b. The sensitivity of these local routes is considered to be high.

There would be significant visual effects on the views and visual amenity experienced from parts of the C252(c) Core Path at Common Hill as a result of the proposed Development.

Drawing on the ZTVs, site visits, and viewpoint analysis, it is considered that there would be no significant effects on the views from core paths within the wider Study Area as a result of the proposed Ascog Wind Energy Project. Whilst the proposed Ascog Development project may be visible from some locations over longer distances, it would appear as a distant feature.

There would be some limited significant effects on views from sailing/kayaking routes and launching points within the Firth of Clyde within approximately 2-3 km of the proposed turbines.

7.7.7 National Routes and Long Distance Routes

The visual assessment has considered the views from national recreational routes within the 35 km Study Area, which includes long distance routes and Sustrans national cycle ways, both of which are illustrated in Figures 7.6b and 7.7. The sensitivity of these national/regional routes is considered to be high due to the generally higher levels of use when compared to local routes and the tendency for these to be more focused on recreation.

There would be a limited significant visual effect on the view and visual amenity experienced from the closest part of the West Island Way as it crosses the B881 and continues along the south of Loch Ascog.

Table 7.15 Visual Effects on Views from Recreational Routes

Route	Description of Effect
Core Paths	
C232 (c)	<p>This core path is located 574 m to the east of the nearest proposed turbine at its closest point. The 1 km route follows the north-south orientation of the A844 coastal road between Montford and Ascog Bay. Intervening forestry and woodland would screen the turbines from this core path and any views would be intermittent and heavily filtered. The sensitivity is high. The magnitude of change would vary from medium to zero and the overall level of effect would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
C252 (c)	<p>This core path is located 777m to the north of the nearest proposed turbine at its closest point. The 1.5 km route follows a roughly east-west direction on the southern side of Common Hill. There would be clear and open close range views from this core path and the type of view is illustrated in viewpoint 1: Common Hill (high magnitude) The sensitivity is high. The magnitude of change would vary from high to zero and the overall level of effect would be Moderate/Substantial.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13 km). Each scheme would contribute a negligible level of effect individually</p>

Route	Description of Effect
	and also when considered as a group and the level of cumulative effect would remain as Moderate/Substantial .
C241	<p>This core path is located 1.4 km to the west of the nearest proposed turbine at its closest point. The 1.2 km route follows the north-south orientation of the B881 between Rothesay and Townhead. In theory ~250m of the total route length is covered by the ZTV but in reality there would be no views at all due to intervening vegetation and built form. The sensitivity is high. The magnitude of change would be zero and the overall level of effect would be No Change.</p> <p><u>Cumulative Assessment</u></p> <p>There would be no cumulative visibility and the level of cumulative effect would remain as No Change.</p>
C242 (a)	<p>This core path is located 1.7 km to the west of the nearest proposed turbine at its closest point. The 400m route follows a north-south orientation parallel to the B881 in Rothesay. Part of the route is on Meadows Road. Viewpoint 3 illustrates the type of view available (medium to low magnitude). ZTV coverage indicates that there would be partial views and intervening vegetation and built form would further limit visibility. The sensitivity is high. The magnitude of change would vary from low to zero and the overall level of effect would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There would be no cumulative visibility and the level of cumulative effect would remain as Slight.</p>
C242 (c)	<p>This core path is located 1.7 km to the west of the nearest proposed turbine at its closest point. The 500m route follows a east-west orientation alongside a watercourse. Viewpoint 3 illustrates the type of view available (medium to low magnitude). ZTV coverage indicates that there would be partial views and intervening vegetation and built form would further limit visibility. The sensitivity is high. The magnitude of change would vary from low to zero and the overall level of effect would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There would be no cumulative visibility and the level of cumulative effect would remain as Slight</p>
C237(b)	<p>This core path is located 2 km to the west of the nearest proposed turbine at its closest point. The 3 km route follows a north-south orientation to the west of Loch Fad and crosses the B878. Viewpoint 3 illustrates the type of view available (medium to low magnitude). ZTV coverage indicates that there would be partial views and intervening vegetation and built form would further limit visibility. The sensitivity is high. The magnitude of change would vary from low</p>

Route	Description of Effect
	<p>to zero and the overall level of effect would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There would be no cumulative visibility and the level of cumulative effect would remain as Slight</p>
C237 (a)	<p>This core path is located 2.2 km to the northwest of the nearest proposed turbine at its closest point. The 3.5 km route provides an inland connection between Port Bannatyne and Rothesay and includes Westland Road. ZTV coverage indicates that there would be intermittent views and intervening vegetation and built form would further limit visibility. The sensitivity is high. The magnitude of change would vary from low to zero and the overall level of effect would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~16 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
C237 (c)	<p>This core path is located 1.7 km to the southwest of the nearest proposed turbine at its closest point. The 5 km route follows a north-south orientation between Loch Fad, Loch Ascog and crosses the B881. ZTV coverage indicates that there would be intermittent views and intervening vegetation would further limit visibility. The sensitivity is high. The magnitude of change would vary from medium/low to zero and the overall level of effect would be Moderate and not significant although there would be significant effects affecting ~1 km of the total route length.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~14 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Moderate.</p>
C317	<p>This core path is located 2.2 km to the south of the nearest proposed turbine at its closest point. The 1.5 km route follows a east-west orientation such that there would be no head-on views of the proposed turbines. Wireframes show that there would be partial views and intervening vegetation would further limit visibility. The sensitivity is high. The magnitude of change would vary from low to zero and the overall level of effect would be Slight .</p> <p><u>Cumulative Assessment</u></p>

Route	Description of Effect
	<p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~13 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
C250(a) C250(b)	<p>These two core paths are located around Mackinlay Street, ~2.2 km to the north-west of the nearest proposed turbine. The two ~750m routes are within the West Bay part of the settlement of Rothesay. Wireframes show that there would be partial views and intervening vegetation would further limit visibility to blade tips only. The sensitivity is high. The magnitude of change would vary from negligible to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, to the east (at minimum viewing distances of ~15 km) and the level of cumulative effect would remain as Slight.</p>
C249	<p>This core path is located 3.5 km to the northwest of the nearest proposed turbine at its closest point. The 1 km route follows a northeast-southwest orientation such that there would be no head-on views of the proposed turbines. Wireframes show that there would be partial views and intervening vegetation would further limit visibility. The sensitivity is high. The magnitude of change would vary from negligible to zero and the overall level of effect would be Slight and not significant</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~17 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
C232(a)	<p>This core path is located on the coast, ~3 km to the north-west of the nearest proposed turbine at its closest point. The ~2 km route connects the West Bay part of the settlement of Rothesay with Port Bannatyne and partially overlaps the A844. Wireframes show that there would be partial views and intervening vegetation would further limit visibility to blade tips only. The sensitivity is high. The magnitude of change would vary from negligible to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of</p>

Route	Description of Effect
	~17 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight .
C248	<p>This core path is located in Port Bannatyne, ~3.5 km to the north-west of the nearest proposed turbine at its closest point. The ~2 km route partially overlaps the A844. Wireframes show that there would be intermittent views and intervening vegetation and built form would further limit visibility to blade tips only. The sensitivity is high. The magnitude of change would vary from negligible to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~17 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
C410 and C411	<p>These two core paths are located ~4.6 km to the south of the nearest proposed turbine. The two short (~350m) routes are located within a well vegetated landscape with an easterly aspect looking across the Firth of Clyde. Mount Stewart is located to the north of these paths. Wireframes show that there would be partial views and intervening vegetation would further limit visibility to blade tips only. The sensitivity is high. The magnitude of change would vary from negligible to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~17 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
C222 and C208 and C402	<p>These three core paths are located ~4.6 km to the north of the nearest proposed turbine. The three short (less than 1 km) routes are located on the southern tip of the Cowal peninsula in coastal locations. Viewpoint 4 (low to negligible magnitude) indicates the type of view that would be available. Wireframes show that there would be partial views and intervening vegetation would further limit visibility to blade tips only. The sensitivity is high. The magnitude of change would vary from negligible to zero and the overall level of effect would be Slight and not significant.</p>

Route	Description of Effect
	<p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~17 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
National Recreational Routes (within 35 km)	
West Island Way	<p>The ~50 km West Island Way passes within ~1.5 km of the nearest proposed turbine at its closest point. There would be locations along the route where there would be clear and open views of the proposed Ascog turbines and significant effects would occur affecting ~2 km of the total route length. Viewpoint 3 indicates the type of view available. At locations along the route with viewing distances to the proposed turbines greater than ~3 km the magnitude of change would reduce to low. The sensitivity is high. ZTV coverage is ~20% of the total route length. The magnitude of change would vary from medium to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~15 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
Five Degrees West Challenge	<p>The ~35 km Five Degrees West Challenge passes within ~4 km of the nearest proposed turbine at its closest point. Viewpoint 4 (low to negligible) indicates the type of view available in the most visible scenario. The sensitivity is high. ZTV coverage is ~15% of the total route length. The magnitude of change would vary from low to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~15 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
Ayrshire Coastal Path	<p>The ~50 km path passes within ~9.5 km of the nearest proposed turbine at its closest point. Viewpoints 8, 11 and 16 (low, low to negligible and zero magnitude respectively) indicate the type of view available. The sensitivity is</p>

Route	Description of Effect
	<p>high. ZTV coverage is ~40% of the total route length. The magnitude of change would vary from low to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan (at minimum viewing distances of ~2 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
Kintyre Way	<p>This route is located to the west of the application site on the periphery of the study area and is 22 km from the nearest turbine at its closest point. ZTV coverage is intermittent and would affect a total of ~8 km of the ~25 km route length within the LVSA. Any views of the proposed turbines at these distances would result in negligible magnitude of change even in the most visible/good weather scenarios. The sensitivity is high. The magnitude of change would vary from negligible to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is cumulative visibility of Cour wind farm (at minimum viewing distances of ~10 km). This wind energy project would contribute a negligible level of effect and the level of cumulative effect would remain as Slight.</p>
Three Lochs Way	<p>This route is located to the northeast of the application site on the periphery of the study area and is 27 km from the nearest turbine at its closest point. ZTV coverage is intermittent and would affect a total of ~2 km of the ~25 km route length within the LVSA. Any views of the proposed turbines at distances of greater than 20 km would result in negligible magnitude of change even in the most visible/good weather scenarios. The sensitivity is high. The magnitude of change would vary from negligible to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is cumulative visibility of Waterhead wind farm (at minimum viewing distances of ~20 km). This wind energy project would contribute a negligible level of effect and the level of cumulative effect would remain as Slight.</p>
Sustrans National Cycle Route 78	<p>This route is located to the west of the application site on the periphery of the study area and is 25 km from the nearest turbine at its closest point. ZTV coverage is intermittent and would affect a total of ~12 km of the ~35 km route length within the LVSA. Any views of the proposed turbines at these distances would result in negligible magnitude of change even in the most visible/good weather scenarios. The sensitivity is high. The magnitude of change would vary</p>

Route	Description of Effect
	<p>from negligible to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is cumulative visibility of Cour wind farm (at minimum viewing distances of ~5 km). This wind energy project would contribute a negligible level of effect and the level of cumulative effect would remain as Slight.</p>
Sustrans National Cycle Route 73	<p>This route is located to the southwest of the application site on the isle of Arran and is 19 km from the nearest turbine at its closest point. ZTV coverage is intermittent and would affect a total of ~6 km of the ~20 km route length within the LVSA. Any views of the proposed turbines at these distances would result in negligible magnitude of change even in the most visible/good weather scenarios. The sensitivity is high. The magnitude of change would vary from negligible to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>The affected areas are within the ZTV of the existing, consented and application wind farms on the North Ayrshire Moorland Hills. The minimum viewing distance would be 20 km. The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
Sustrans National Cycle Route 75	<p>This route is located in the northern half of the LVSA and is 16 km from the nearest turbine at its closest point. ZTV coverage is virtually absent from the entire route length and would affect a total of ~1 km of the ~50 km route length within the LVSA. Any views of the proposed turbines would result in negligible magnitude of change even in the most visible/good weather scenarios. The sensitivity is high. The magnitude of change would vary from negligible to zero and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>The route is partially overlapped by the ZTV of the existing and application wind farms on the North Ayrshire Moorland Hills. The minimum viewing distance would be 15 km. The level of effect would be negligible for each individual scheme and the group and the level of cumulative effect would remain as Slight.</p>
Sailing and Kayaking Recreational Routes (within 35 km)	
Sailing Routes	<p>The sailing routes within the LVSA are illustrated on Figure 7.7. The broad pattern of the sailing routes follows the coastline with occasional linkages across larger water bodies such as the Ardrossan to Brodick route. There are also hatched areas which are popular sailing areas. The routes are within 1.5</p>

Route	Description of Effect
	<p>km of the nearest turbine at the closest point which is to the east of the application site within the Firth of Clyde. Sailing vessels are considered to be of high sensitivity. The ZTV coverage is concentrated on the Firth of Clyde but also includes other water bodies such as Loch Striven to the north. Rothesay Bay is largely outside the ZTV and would be unaffected. Significant effects (high to medium magnitude) are predicted to occur within distances of up to 4 km from the nearest proposed turbines and these would be concentrated on the Firth of Clyde to the east of the application site from which all three turbines would be visible “broadside” against the horizon. At distances of 4 to 10 km the magnitude of change would reduce to low and negligible and would not be significant. At distances of greater than 10 km there would be a slight level of effect only. The significant effects threshold would be reduced to approximately 2.5 km when viewing from the north or south along the main axis of the wind farm. The overall level of effect on sailing routes would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>The existing, consented and application wind farms on the North Ayrshire Moorland Hills would be visible sequentially with Ascog at minimum viewing distances of ~5 km. The cumulative level of effect would increase locally but the overall level of cumulative effect would remain Slight.</p>
Kayaking Routes	<p>The kayaking routes within the LVSA are illustrated on Figure 7.7. The routes are within 2 km of the nearest turbine at the closest point which is to the east of the application site within the Firth of Clyde. Kayakers are considered to be of high sensitivity. The ZTV coverage is concentrated on the Firth of Clyde but also includes other water bodies such as Loch Striven to the north. Rothesay Bay is largely outside the ZTV and would be unaffected. Significant effects (high to medium magnitude) are predicted to occur within distances of up to 4 km from the nearest proposed turbines and these would be concentrated on the Firth of Clyde to the east of the application site from which all three turbines would be visible “broadside” against the horizon. At distances of 4 to 10 km the magnitude of change would reduce to low and negligible and would not be significant. At distances of greater than 10 km there would be a slight level of effect only. The significant effects threshold would be reduced to approximately 2.5 km when viewing from the north or south along the main axis of the wind farm. The overall level of effect on kayak routes would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>The existing, consented and application wind farms on the North Ayrshire Moorland Hills would be visible sequentially with Ascog at minimum viewing distances of ~5 km. The cumulative level of effect would increase locally but the</p>

Route	Description of Effect
	overall level of cumulative effect would remain Slight .
Launching Points	
L067	<p>This launching point is located ~4.6 km to the north of the nearest proposed turbine on the southern tip of the Cowal Peninsula. Viewpoint 4 (low to negligible magnitude) indicates the type of view that would be available. Wireframes show that there would be partial views and intervening vegetation would further limit visibility to blade tips only. The sensitivity is high. The magnitude of change would be negligible and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~17 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
L090	<p>This launching point is located near Mackinlay Street, ~2.2 km to the north-west of the nearest proposed turbine. Wireframes show that there would be partial views and intervening vegetation would further limit visibility to blade tips only. The sensitivity is high. The magnitude of change would be negligible and the overall level of effect would be Slight and not significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, to the east (at minimum viewing distances of ~15 km) and the level of cumulative effect would remain as Slight.</p>

7.7.8 Visual Effects on Views from Recreational and Tourist Destinations

The visual effects on the views from recreational and tourist destinations within the Study Area are assessed in Table 7.16.

Views from Rothesay Golf Club would be significantly affected by the proximity of the proposed Ascog Wind Energy Project. There would be no significant effects on other recreational and tourist destinations within the study area as a result of the proposed Ascog Wind Energy Project.

Table 7.16 Visual Effects on Views from Recreational and Tourist Destinations

Receptor	Description of Effect
<i>Recreational and Tourist Destinations within the ZTV and within 5 km distance</i>	
Mount Stuart Garden and Designed Landscape (GDL)	<p>As illustrated by viewpoint 2 (No change), this tourist destination is well insulated visually and the core areas of the site including the particular tourist attractions of the house and its policies would not be affected by the proposed turbines at Ascog. Peripheral areas to the north near the A844 may be slightly affected although any views would be along the main axis of the wind farm, reducing the potential for significant effects and would be subject to intervening screening. The sensitivity would be high. The level of effect would vary from moderate to zero and would be Slight overall.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~15 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
Castle Toward GDL	<p>This tourist destination consists of an outdoor centre and ruined castle set within woodland located near the coast. The type of view from the southern periphery of the tourist area is illustrated by viewpoint 4 (negligible magnitude). The destination is well insulated visually and the core areas of the site would not be affected by the proposed turbines at Ascog due to screening. Peripheral areas to the south near the coast may be slightly affected although any views would be along the main axis of the wind farm, reducing the potential for significant effects and would be subject to intervening screening. The sensitivity would be high. The level of effect would vary from moderate to zero and would be Slight overall.</p> <p><u>Cumulative Assessment</u></p> <p>There is visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~15 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight.</p>
Toward Point Picnic Site	<p>This tourist destination is on the southern tip of the Cowal peninsula and is reasonably close to Castle Toward described above. The type of view is illustrated by viewpoint 4 (negligible magnitude). The sensitivity would be high. The level of effect would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There is sequential visibility of Waterhead Moor, Kelburn Estate, Dalry and</p>

Receptor	Description of Effect
	Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~15 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight .
Rothesay Golf Club	<p>The golf course (high sensitivity) is located to the north of the proposed development and is 600m from the nearest proposed turbine at its closest point. The 18 hole course would be subject to significant visual effects as a result of the three proposed turbines which would be clearly visible in southerly views. The magnitude of change would vary between high and low and would be medium overall. The level of effect would be Moderate/Substantial and significant.</p> <p><u>Cumulative Assessment</u></p> <p>There is sequential visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~14 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Moderate/Substantial.</p>
<i>Recreational and Tourist Destinations within the ZTV and within 5 to 35 km distance</i>	
Clyde Muirshiel Regional Park	<p>This large area consists of 292 km² of land located to the east of the application site. The Regional Park is ~10 km from the nearest proposed turbine at its closest point. ZTV coverage is concentrated on the west –facing slopes and summits on the western side of the park and accounts for ~15% of the total park area. Viewpoints 8, 13 and 15 (negligible magnitude) indicate the type of view that would be available. The level of effect would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There is cumulative visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan which are all located within the park. Within close proximity of each individual scheme there would be significant cumulative effects although the contribution of Ascog would be Slight and the overall level of cumulative effect would not be significant given the capacity of the moorland hills to accommodate multiple wind farms.</p>
Kelburn Castle and Country Centre	<p>Any views from this tourist destination near Largs on the far side of the Firth of Clyde would be at distances of ~13 km. ZTV coverage is intermittent throughout the Kelburn Estate due to the influence of the burn which runs through the site. Vegetation screening is likely from inland locations within the estate, further reducing the actual levels of visibility. The type of view is illustrated in Viewpoint 17 (negligible magnitude). The level of effect would be Slight.</p>

Receptor	Description of Effect
	<p><u>Cumulative Assessment</u></p> <p>There is no theoretical cumulative visibility of other wind farms. The overall level of cumulative effect would remain Slight.</p>
Loch Lomond Regional Park	<p>This large (400 km²) park is largely outwith the LVSA. There are however small areas of the park to the north of Hellensburgh that would be theoretically affected by the proposed Ascog Wind Energy Project. The affected areas would be at viewing distances of 30 km and the level of effect would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There is theoretical cumulative visibility of Waterhead Moor proposed wind farm. The minimum viewing distance would be 20 km and the overall level of cumulative effect would be Slight.</p>
Skelmorlie Golf Club	<p>The Skelmorlie Golf Club is located on the west facing slopes of the hills above Skelmorlie overlooking the Firth of Clyde. There would be views of the proposed Development at distances of ~10.8 km and the magnitude of change would be negligible and the level of effect would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There is no theoretical cumulative visibility and the overall level of cumulative effect would remain Slight.</p>
Largs	<p>The Largs Golf Club is located adjacent to the A78 Irvine Road to the south of Largs. There would be views of the proposed Ascog Wind Energy Project at minimum distances of ~12 km. The type of view is illustrated in Viewpoint 17 (negligible magnitude) and the level of effect would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There is no theoretical cumulative visibility and the overall level of cumulative effect would remain Slight.</p>
Lunderston Bay, Ardgowan and Largs Bay	<p>There are several beaches and picnic spots located on the western coastal edge of the mainland between Gourock and Ardrossan, notably Lunderston Bay, Ardgowan and Largs Bay. The minimum viewing distance to the proposed Ascog Wind Energy Project would be ~10 km. Viewpoints 8, 11 and 14 illustrate the types of view that would be available. The magnitude of change would be negligible and the level of effect would be Slight.</p> <p><u>Cumulative Assessment</u></p> <p>There is no theoretical cumulative visibility and the overall level of cumulative effect would remain Slight.</p>
Great Cumbrae Island	<p>The western side of Great Cumbrae fall within the ZTV and there are numerous beaches and picnic spots within this zone. The type of view that would be available is illustrated in viewpoints 6 and 9 (negligible magnitude). The minimum viewing distance would be ~8 km. The magnitude of change would be</p>

Receptor	Description of Effect
	negligible and the level of effect would be Slight . <u>Cumulative Assessment</u> There is cumulative visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan wind farms from the elevated vantage point at Glaid Stone. The minimum viewing distance is 7 km and the cumulative level of effect would remain as Slight .
Farland Head	This location near West Kilbridge is illustrated in viewpoint 16. The viewing distance is ~16 km and the level of effect would be Slight . <u>Cumulative Assessment</u> There is cumulative visibility of Ardrossan wind farm from the elevated vantage point at Glaid Stone. The minimum viewing distance is 5.5 km and the cumulative level of effect would increase to Moderate .
Sannox	This beach on the Isle of Arran is located ~20 km to the south of the nearest proposed turbine. The type of view is illustrated in viewpoints 18 and 19 (negligible magnitude) and the level of effect would be Slight . <u>Cumulative Assessment</u> There is sequential visibility of Waterhead Moor, Kelburn Estate, Dalry and Ardrossan on the North Ayrshire Moorland Hills to the east (at minimum viewing distances of ~20 km). Each scheme would contribute a negligible level of effect individually and also when considered as a group and the level of cumulative effect would remain as Slight .
Innellan	The beach and picnic spots along the coast at Innellan are located ~7 km from the nearest proposed turbine at the closest point. However, there would be no view of the proposed development due to intervening vegetation and landform and the level of effect would be No Change
Rosneath Cove	The type of view from the Roseneath Peninsular is illustrated in viewpoint 20 (negligible magnitude). The viewing distance is ~21 km and the level of effect would be Slight . <u>Cumulative Assessment</u> There would be no cumulative effects from the coastal areas of the peninsular.

7.8 Summary of Residual Landscape and Visual Effects

A summary of the landscape effects and an evaluation of their significance are provided in Table 7.17 and summary of the visual effects and an evaluation of significance are provided in Table 7.18.

Table 7.17: Summary and Evaluation of the Predicted Landscape Effects

Receptor	Assessment: LVIA (Ascog Wind Energy Project)			Assessment: CLVIA (Other Wind Energy Development)			Assessment: CLVIA (Ascog Wind Energy Project and other Wind Energy Development)
	Sensitivity	Magnitude	Level of Effect*	Magnitude (existing)	Magnitude (existing and consented)	Magnitude (existing, consented and application)	Cumulative Level of Effect
Direct Effects: the Ascog Site Area and 'Host' Landscape Character Area							
Ascog Wind Energy Project Site Area	Medium	Very High	Substantial	Not applicable	Not applicable	Not applicable	No cumulative effects
Lowland Rolling Farmland with Estates LCT	Medium	Low	Moderate	Zero	Zero	Zero	No cumulative effects
Note: There would be localised significant effects on part of Lowland Rolling Farmland with Estates LCT within 800 m of the turbines.							
Indirect Effects on Local Landscape Character							
Basalt Lowlands	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
Coastal Plain	Medium	Zero	No change	Zero	Zero	Zero	No change
Craggy Upland	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
Open Ridgeland	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
Rocky Mosaic	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible

Receptor	Assessment: LVIA (Ascog Wind Energy Project)			Assessment: CLVIA (Other Wind Energy Development)			Assessment: CLVIA (Ascog Wind Energy Project and other Wind Energy Development)
	Sensitivity	Magnitude	Level of Effect*	Magnitude (existing)	Magnitude (existing and consented)	Magnitude (existing, consented and application)	Cumulative Level of Effect
Steep Ridgeland and Mountains	Medium	Negligible	Slight /Negligible	Negligible	Negligible	Negligible	Slight/Negligible
Coastal Fringe with Agriculture	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
Raised Beach Coast	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
Sounds Narrows and Islands Seascape	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Rothesay Bay	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Ascog Bay	High	Low	Moderate	Negligible	Negligible	Negligible	Moderate
Kerrycroy Bay	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Note: There would be localised significant effects on parts of Sounds Narrows and Islands Seascape, notably Ascog Bay, and within 4 km of the turbines.							
Indirect Effects on Nationally Designated Landscape Character							
Coastal Headland	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Rugged Granite Uplands	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Open Upland Hills	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Direct Effects on Landscape Designations							

Receptor	Assessment: LVIA (Ascog Wind Energy Project)			Assessment: CLVIA (Other Wind Energy Development)			Assessment: CLVIA (Ascog Wind Energy Project and other Wind Energy Development)
	Sensitivity	Magnitude	Level of Effect*	Magnitude (existing)	Magnitude (existing and consented)	Magnitude (existing, consented and application)	Cumulative Level of Effect
Area of Panoramic Quality	Medium	Negligible	Slight/Negligible	Negligible	Negligible	Negligible	Slight/Negligible
Note: There would be localised significant effects on part of Lowland Rolling Farmland with Estates LCT within 800 m of the turbines.							
Indirect Effects on Surrounding Landscape Designations within 10 km							
North Ayrshire Sensitive Landscape Area	Medium	Negligible	Slight/Negligible	Negligible	Negligible	Negligible	Slight/Negligible
Kyles of Bute National Scenic Area	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Indirect Effects on Surrounding Landscape Designations within 10 to 35 km							
North Arran National Scenic Area	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Loch Lomond National Scenic Area	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Loch Lomond and the Trossachs National Park	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight

Table 7.18: Summary and Evaluation of the Predicted Visual Effects

Receptor	Assessment: LVIA (Ascog Wind Energy Project)			Assessment: CLVIA (Other Wind Energy Development)			Assessment: CLVIA (Ascog Wind Energy Project and other Wind Energy Development)
	Sensitivity	Magnitude	Level of Effect*	Magnitude (existing)	Magnitude (existing and consented)	Magnitude (existing, consented and application)	Cumulative Level of Effect
Visual Effects on Views from Settlements: (defined by the Argyll and Bute Local Plan)							
Rothsay and Port Bannatyne	High	High	Negligible	Slight	Negligible	Negligible	Negligible
Note: There would be localised significant effects on views from areas around Ballochgoy, Roseland Caravan Site and Hillhouse Road where there are open views towards the site.							
Visual Effects on Views from (8) Residential Properties: <i>(Note: In summary, only those eight properties likely to experience views that would be significantly affected are listed here)</i>							
Ascog Farm	High	Very High	Substantial	Zero	Zero	Zero	No cumulative effects
High Bogany	High	High	Substantial	Not applicable	Not applicable	Negligible	Substantial (Ascog)
Braeside	High	High	Substantial	Not applicable	Not applicable	Negligible	Substantial (Ascog)
Beech Park	High	Medium	Moderate/ Substantial	Negligible	Negligible	Negligible	Moderate/Substantial (Ascog)
Duneastein	High	High	Substantial	Not applicable	Not applicable	Not applicable	No cumulative effects
Single storey detached house	High	Medium	Moderate/ Substantial	Negligible	Negligible	Negligible	Moderate/Substantial (Ascog)

Receptor	Assessment: LVIA (Ascog Wind Energy Project)			Assessment: CLVIA (Other Wind Energy Development)			Assessment: CLVIA (Ascog Wind Energy Project and other Wind Energy Development)
	Sensitivity	Magnitude	Level of Effect*	Magnitude (existing)	Magnitude (existing and consented)	Magnitude (existing, consented and application)	Cumulative Level of Effect
Whin Cottage	High	Medium	Moderate/ Substantial	Negligible	Negligible	Negligible	Moderate/Substantial (Ascog)
Windyhall	High	Medium	Moderate/ Substantial	Negligible	Negligible	Negligible	Moderate/Substantial (Ascog)
Visual Effects on Views from Transport Routes within 5 km (Note: There would be a limited significant visual effect on views from the A844, B881 and B878 as they passes close to the proposed turbines)							
A844	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
A886	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
A815	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
A78	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
B881	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
B878	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible

Receptor	Assessment: LVIA (Ascog Wind Energy Project)			Assessment: CLVIA (Other Wind Energy Development)			Assessment: CLVIA (Ascog Wind Energy Project and other Wind Energy Development)
	Sensitivity	Magnitude	Level of Effect*	Magnitude (existing)	Magnitude (existing and consented)	Magnitude (existing, consented and application)	Cumulative Level of Effect
B875	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
B896	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
Single Track Road at Toward Point	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
Visual Effects on Views from Transport Routes within 10 to 35 km							
A770	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
A841	Medium	Negligible	Slight/ Negligible	Negligible	Negligible	Negligible	Slight/Negligible
Visual Effects on Views from Ferry Routes							
(Note: There would be a limited significant visual effect on views from the Wemyss Bay to Rothesay route as it passes closes to the proposed turbines)							
Gourock to Dunoon	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Gourock (McInroy's Point) to Dunoon (Hunter's Quay)	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight

Receptor	Assessment: LVIA (Ascog Wind Energy Project)			Assessment: CLVIA (Other Wind Energy Development)			Assessment: CLVIA (Ascog Wind Energy Project and other Wind Energy Development)
	Sensitivity	Magnitude	Level of Effect*	Magnitude (existing)	Magnitude (existing and consented)	Magnitude (existing, consented and application)	Cumulative Level of Effect
Bute: Wemyss Bay to Rothesay	High	Low	Moderate	Slight	Slight to Moderate	Moderate	Moderate
Cumbræ: Largs to Cumbræ Slip	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Arran: Ardrossan to Brodick	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Arran: Claonaig to Lochranza	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Visual Effects on Views from Recreational Routes: Adopted Core Paths							
C232 (c)	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
C252 (c)	High	High	Moderate/ Substantial	Negligible	Negligible	Negligible	Moderate/Substantial (Ascog)
C241	High	Zero	No views	Zero	Zero	Zero	No cumulative effects
C242 (a)	High	Negligible	Slight	Zero	Zero	Zero	No cumulative effects
C242 (c)	High	Negligible	Slight	Zero	Zero	Zero	No cumulative effects
C237(b)	High	Negligible	Slight	Zero	Zero	Zero	No cumulative effects
C237 (a)	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
C237 (c)	High	Low	Moderate	Negligible	Negligible	Negligible	Moderate

Receptor	Assessment: LVIA (Ascog Wind Energy Project)			Assessment: CLVIA (Other Wind Energy Development)			Assessment: CLVIA (Ascog Wind Energy Project and other Wind Energy Development)
	Sensitivity	Magnitude	Level of Effect*	Magnitude (existing)	Magnitude (existing and consented)	Magnitude (existing, consented and application)	Cumulative Level of Effect
C317	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
C250(a) and C250(b)	High	Negligible	Slight	Zero	Zero	Negligible	Slight
C249	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
C232(a)	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
C248	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
C410 and C411	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
C222 and C208 and C402	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
National Recreational Routes (within 35 km)							
West Island Way	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Note: There would be a limited significant visual effect on views from this route as it passes close to the proposed site at Loch Ascog and crossing the B881							
Five Degrees West Challenge	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Ayrshire Coastal Path	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Kintyre Way	High	Negligible	Slight	Zero	Zero	Negligible	Slight
Three Lochs Way	High	Negligible	Slight	Zero	Zero	Negligible	Slight
Sustrans National Cycle Route 78	High	Negligible	Slight	Zero	Zero	Negligible	Slight

Receptor	Assessment: LVIA (Ascog Wind Energy Project)			Assessment: CLVIA (Other Wind Energy Development)			Assessment: CLVIA (Ascog Wind Energy Project and other Wind Energy Development)
	Sensitivity	Magnitude	Level of Effect*	Magnitude (existing)	Magnitude (existing and consented)	Magnitude (existing, consented and application)	Cumulative Level of Effect
Sustrans National Cycle Route 73	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Sustrans National Cycle Route 75	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Sailing and Kayaking Recreational Routes (within 35 km)							
<i>(Note: There would be limited significant visual effects on views from these routes as they pass close to the proposed turbines)</i>							
Sailing and Kayaking Routes	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Launching Points							
L067	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
L090	High	Negligible	Slight	Zero	Zero	Negligible	Slight
Recreational and Tourist Destinations within the ZTV and within 5 km distance							
Mount Stuart GDL	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Castle Toward GDL	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Toward Point Picnic Site	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Rothsay Golf Club	High	Medium	Moderate/ Substantial	Negligible	Negligible	Negligible	Moderate/Substantial (Ascog)
Recreational and Tourist Destinations within the ZTV and within 5 to 35 km distance							

Receptor	Assessment: LVIA (Ascog Wind Energy Project)			Assessment: CLVIA (Other Wind Energy Development)			Assessment: CLVIA (Ascog Wind Energy Project and other Wind Energy Development)
	Sensitivity	Magnitude	Level of Effect*	Magnitude (existing)	Magnitude (existing and consented)	Magnitude (existing, consented and application)	Cumulative Level of Effect
Clyde Muirshiel Regional Park	High	Negligible	Slight	Negligible	Negligible	High	Substantial (Waterhead Moor)
Kelburn Castle and Country Centre	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Loch Lomond Regional Park	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Skelmorlie Golf Club	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Largs	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Lunderston Bay, Ardgowan and Largs Bay	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Great Cumbrae Island	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Farland Head	High	Negligible	Slight	Low	Negligible	Negligible	Moderate
Sannox	High	Negligible	Slight	Negligible	Negligible	Negligible	Slight
Innellan	High	Zero	No view	Zero	Zero	Zero	No cumulative effects
Rosneath Cove	High	Negligible	Slight	Zero	Zero	Zero	No cumulative effects

7.9 Summary of Significant Effects and Conclusions

7.9.1 Introduction

The methodology for the LVIA conforms to the Guidelines for Landscape and Visual Impact Assessment, Second Edition⁴⁰ (GLVIA).

The assessment process has encompassed the construction, operation, and decommissioning phases of the proposed Ascog Wind Energy Project and has included design iteration and re-assessment of the residual effects. The process has sought to achieve an acceptable compromise between maximising energy capture and achieving an acceptable design in terms of landscape and visual effects.

7.9.2 Consultation and Scope of Assessment

Consultation regarding the scope of the landscape and visual assessment and in particular, viewpoint selection was carried out with Scottish Natural Heritage (SNH) throughout 2011. Consultation and research of local authority planning application databases, was carried out in relation to cumulative wind energy development for inclusion in the assessment.

7.9.3 Viewpoint and ZTV Analysis

The Zone of Theoretical Visibility and viewpoint analysis is used to assist the design and further define the scope of the assessment process.

The viewpoint assessment is summarised in Table A7.4 (in Appendix F) and the analysis indicates that significant effects would extend to an area of approximately 2 km distance from the nearest proposed wind turbines as indicated by Viewpoint 1: Common Hill (locally known as Canada Hill), and Viewpoint 3: Rothesay on the Isle of Bute.

Further detailed site survey and analysis reveals that some limited significant visual effects may also occur at distance of between 2 and 3 km from the turbines to the south and southwest of the proposed Ascog Wind Energy Project in the vicinity of Loch Ascog and the West Island Way. Views from recreational sailing craft and kayaks could also experience

⁴⁰ Guidelines for Landscape and Visual Impact Assessment, Second Edition, Landscape Institute and IEMA, 2002.

significant effects within approximately 3km of the proposed turbines, within the Firth of Clyde to the west and southwest of the proposed Ascog Wind Energy Project.

In terms of cumulative effects, the proposed Ascog Wind Energy Project is isolated from other wind farms due to its island location, the nearest being on the mainland at Kelburn Estate at approximately 15 km distance from Ascog. The cumulative viewpoint assessment indicates that there would be no significant cumulative effects (with the exception of viewpoint 3), with many viewpoints recording little or no cumulative wind farm visibility.

7.9.4 Mitigation Inherent in Proposed Development

The design process has taken account of national and local planning policy as well as design guidance from SNH and the Argyll and Bute Council's Supplementary Planning Guidance on Wind Energy.

7.9.5 Limited Residual Landscape Effects

There would be limited significant landscape effects affecting the proposed Development site area within approximately 800 m and as a result affecting localised effects on part of Lowland Rolling Farmland with Estates LCT and part of the Area of Panoramic Quality.

7.9.6 Limited Predicted Residual Visual Effects

There would be limited, localised significant effects on views from within Rothesay around Ballochgoy, Roseland Caravan Site and Hillhouse Road where there are open views towards the site as represented by Viewpoint 3 (Figure 7.15a/b). The views from a further eight residential properties would also be significantly affected.

There would be significant visual effects on views from part of the Core Path (C252c) and Rothesay Golf Course, at Common Hill and part of the route of the West Island Way, as it passes Loch Ascog and crosses the B881.

Significant visual effects on views from roads could be experienced from short sections of the A844, B881, B878, and part of the Bute: Wemyss Bay to Rothesay ferry route whilst passing closest to the proposed Ascog Wind Energy Project. There would also be some limited significant effects on views from sailing/kayaking routes within the Firth of Clyde within approximately 2 to 3 km of the proposed turbines.

7.9.7 Cumulative Effects

The cumulative viewpoint assessment indicates that there would be no significant cumulative effects (with the exception of Viewpoint 3), with many viewpoints recording little or no cumulative wind farm visibility, resulting from the proposed Ascog Wind Energy Project in combination with other existing, consented or application wind farms.

8 CULTURAL HERITAGE

8.1 Introduction

This Chapter has been produced by AMEC Environment and Infrastructure UK Limited.

The proposed development may affect archaeological and other heritage assets located on the site of the proposed development or in its vicinity. This Section assesses these potential effects.

The Chapter should be read in the light of the project description in Chapter 3. Following a summary of relevant policy and legislation, the Section outlines the scope of the assessment and the data gathering and assessment methodologies that were adopted as part of the cultural heritage assessment. This leads on to a description of overall baseline conditions, the environmental measures that have been incorporated into the wind energy project and, for each receptor, an assessment of potential effects.

8.2 Approach

8.2.1 Scope and Consultation

The scope of the assessment was formulated with reference to the consultation responses received from WoSAS, Historic Scotland and Argyll and Bute Council.

The Historic Scotland consultation response identified the following assets as potentially of particular sensitivity to the proposed development, and therefore potential effects on their settings has been assessed:

- Rothesay Castle (SM/PIC 90252);
- Balmory House (LB A 391746); and
- Mount Stuart garden and designed landscape (GDL 287) and associated assets.

Effects on the visual amenity of the designed landscape have also been considered as part of the Landscape and Visual Assessment.

The West of Scotland Archaeological Service consultation response identified the need to understand the potential effects of the proposed development on any archaeological

features within the site, highlighting the presence of the former settlement of Tayvalley, a tree-ring at the summit of the Hill of Ascog and the potential for previously unrecorded features to be present. In this context, consultation with the *Discover Bute Landscape Partnership* archaeologist was recommended to ensure that the results of the recent landscape-scale archaeological surveys of the island could be incorporated into the baseline.

Consultation with Paul Duffy, the *Discover Bute Landscape Partnership* Archaeologist added little further information; the Ascog area had not been resurveyed in detail, and all records of new features had been passed to the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) for inclusion on their online databases, meaning that data searches at RCAHMS included any new features identified or existing features reassessed in this survey⁴¹. The results had been summarised in a recently published book, which has been referenced as appropriate in this Chapter⁴².

8.2.2 Legislation and Policy Context

The importance of heritage assets is recognised in legislation as well as national and local policy. Policy and legal considerations considered in preparing this assessment are outlined at Table 8.1 below.

Table 8.1: Legislation and Policy Issues considered in Preparing the Cultural Heritage Assessment

Policy Reference	Policy Issue
Legislation	
Historic Environment (Amendment) (Scotland) Act 2011	Designation and management of designated assets and provision for establishment of statutory inventories of historic battlefields and gardens and designed landscapes.
Ancient Monuments and Archaeological Areas Act 1979	Designation and Protection of Scheduled Monuments with requirements for consent for works affecting Scheduled Monuments
The Planning (Listed Buildings and Conservation Areas)	Designation and Protection of Listed Buildings and their settings and Conservation Areas with requirements for consent for works affecting Listed Buildings and/or Conservation Areas

⁴¹ Duffy, P. *Discover Bute Landscape Partnership*, in litt. 1 September 2011

⁴² Geddes, John and Hale, Alex 2010 *The Archaeological Landscape of Bute*. RCAHMS and Discover Bute Landscape Partnership

Policy Reference	Policy Issue
(Scotland) Act 1997	
National Planning Policies	
Scottish Historic Environment Policy (SHEP)	General principles for management of the Scottish historic environment. Implementation of designation procedures and consent applications.
SPP	Application of the principles for the management of the Historic Environment set out by SHEP to the operation of the planning system
PAN2/2011	Protection of designated and non-designated archaeological features within the planning process.
Regional Planning Policies: Argyll and Bute Structure Plan	
Policy Strat DC8	Protection of historic landscapes and associated archaeological remains, built heritage and designed landscapes
Policy Strat DC9	Protection of the historic environment
Policy Strat RE1	Encouragement of wind farm development where the objectives of policies DC8 and 9 can be met and significant adverse effects on the historic environment will not occur
Local Planning Policies: Argyll and Bute Local Plan	
Policy LP ENV 1	Minimising the environmental impacts of new development
Policy LP ENV 11	Protection of Historic Gardens and Designed Landscapes and their settings
Policy LP ENV 13a	Protection of Listed Buildings and their settings
Policy LP ENV 16	Protection of Scheduled Monuments and their settings
Policy LP ENV 17	Protection of archaeological sites

The SPP promotes the protection of the historic environment, as a key part of Scotland's cultural heritage, and as it contributes to sustainable economic growth by virtue of its distinctiveness⁴³. The SPP states that:

*"In most cases, the historic environment (excluding archaeology) can accommodate change which is informed and sensitively managed, and can be adapted to accommodate new uses whilst retaining its special character. However, in some cases the importance of the heritage asset is such that change may be difficult or may not be possible. Decisions should be based on a clear understanding of the importance of the heritage assets"*⁴⁴

It further states that the framework for the protection, conservation and enhancement of all elements of the historic environment to allow the assessment of the impact of proposed

⁴³ SPP paragraph 110

⁴⁴ SPP paragraph 111

development on the historic environment and its setting should be provided in the Development Plans. With regard to setting, SPP states that:

*“Setting is more than the immediate surroundings of a site or building, and may be related to the function or use of a place, or how it was intended to fit into the landscape or townscape, the view from it or how it is seen from around, or areas that are important to the protection of the place, site or building”*⁴⁵

SPP further states that planning authorities in considering development proposals with a potentially significant impact on historic character, *“should consider the capacity of settlements and the surrounding areas to accommodate development without damage to their historic value”*⁴⁶.

In respect of cultural heritage, Structure Plan policy RE 1 – Wind Farm/Wind Turbine Development states that applications will be supported where it is *demonstrated that there is no significant adverse effect on the historic environment*. Local Plan policy REN 1 – Wind Farms and Wind Turbines states that applications will require to *satisfactorily address the potential impact upon sites of historic or archaeological interest and their settings*.

8.2.3 Identification of Vulnerable Receptors

Development can affect heritage assets not only through direct effects (e.g. land take) but also indirect effects, such as changes to the setting of monuments.

8.2.3.1 Direct Effects

Desk-based assessment involves a review of current information only and there may be further features within the application area that are not yet known. The potential for this may be assessed from ground conditions, features within the wider area and a history of land use within the area of proposed development. Information is required on any features that are known to be or could potentially be within areas where ground may be directly disturbed as a result of the proposed development. This includes the footprint of the proposed development as well as any land to be landscaped and managed as part of the overall wind energy project.

⁴⁵ SPP paragraph 112

⁴⁶ *ibid.*

In order to place the development in context and to attempt to identify the potential for unknown archaeological remains, data were collected for a study area extending to a 1 km radius of the site boundary, referred to in this Chapter as the ‘study area’.

There are archaeological features known to survive in the wider vicinity of the site, which may be indicative of the presence of below-ground archaeological features or deposits whose presence cannot be entirely confirmed or discounted on the basis of desk-based sources or a site inspection.

8.2.3.2 Indirect Effects

Effects on the setting of off-site heritage assets are normally described as ‘indirect effects’, as no physical harm would be caused to the feature in question. Effects on the setting of heritage assets as a result of a development can be permanent or temporary. The definition of setting is the subject of much debate, although the concept is enshrined in legislation and policy. It is generally agreed to be a primarily visual concept, though non-visual aspects of the appreciation of the asset may also contribute. SPP advises that:

“Setting is more than the immediate surroundings of a site or building, and may be related to the function or use of a place, or how it was intended to fit into the landscape or townscape, the view from it or how it is seen from around, or areas that are important to the protection of the place, site or building.”

Guidance from Historic Scotland, *Managing Change in the Historic Environment: Setting* (2010) takes a broad view:

“Setting should be thought of as the way in which the surroundings of a historic asset or place contribute to how it is experienced, understood and appreciated.”

For the purposes of this assessment, setting is defined as the spatial extent in which the asset can be experienced and the specific values which contribute to the importance of that asset appreciated; this experience does not necessarily depend on a direct visual or perceptual link, but can also arise from a specific association⁴⁷, although in most cases

⁴⁷ Historic Scotland guidance *Managing Change in the Historic Environment: Setting* (2010) notes the contribution of ‘...function, sensory perceptions or the historical, artistic, literary and scenic associations of places or landscapes.’

visual and perceptual links provide the most important contribution to setting⁴⁸. Conversely, the extent of a setting does not necessarily encompass all land from which the asset is visible or which can be seen from the asset; the critical test is whether the values that combine to give the asset its importance can be discerned or appreciated⁴⁹. Effects can arise though change caused by development within this setting, or through change which is perceptible from within the setting, even though development may be outwith the setting.

The setting of an asset can be considered whether or not it is legally protected, although in legal and policy terms setting is most relevant to designated assets, such as scheduled monuments (AMAAA 1979, SPP) and listed buildings (SPP). The setting of non-designated assets may also be considered, particularly where these are identified as being nationally important, for example through scoping responses and/or designations of particular importance at a local or council level.

Indirect effects on the settings of designated heritage assets within an extended study area of 5 km radius from the site were considered as part of this assessment. This distance has been selected as the greatest distance at which significant adverse effects on the settings of designated heritage assets might be expected to arise. The assessment of indirect effects has been undertaken in close cooperation with the LVIA reported in Chapter 7.

The specific methodology followed by the assessments presented in this Chapter is set out at Section 8.2.4 below, taking into account legislation, policy and considerations raised in the above guidance.

8.2.4 Data Gathering Methodology

8.2.4.1 Desk Study

Existing information and data on the historic environment within the study area and extended study area has been collated from accessible depositories including:

⁴⁸ Historic Scotland guidance *Scoping of Wind Farm Proposals...* (2007) recognises that ‘...the visual appearance and the aesthetic qualities of a site’s surroundings play an important role in modern perceptions of the site and that the alteration of those qualities has the potential to impact upon its historic character and value’ and cites the Reporter to the Abercairny public local inquiry in Scotland, as identifying the centrality of ‘...a visual and contextual relationship between the feature and its surroundings..’

⁴⁹ Historic Scotland guidance *Managing Change in the Historic Environment: Setting* (2010) notes the potential contribution of the ‘...visual envelope, incorporating views to and from the site... key vistas... [and] general views’, but explicitly notes that these consideration may not necessarily apply in all cases, further noting consideration should be given to issues such as whether an asset was intended to be visible from a distance, was designed to enjoy panoramic views, as well as considerations of visual dominance.

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- West of Scotland Archaeological Services (WoSAS) Sites and Monuments Record (SMR), Glasgow;
 - National Monument Record of Scotland (NMRS), Royal Commission on the Ancient and Historical Monuments of Scotland, Edinburgh;
 - Historic Scotland, Edinburgh – databases of listed buildings, Scheduled Monuments and monuments proposed for scheduling (much available via Pastmap);
 - Inventory of Gardens and Designed Landscapes in Scotland;
 - Historic Land Use Assessment Data for Scotland – available via RCAHMS;
 - National Library of Scotland, Edinburgh – map library; and
 - Material supplied by the Discover Bute Landscape Partnership.

Additionally, data has been collated on specified designated heritage assets within an extended study area (Figure 8.1) reaching to 5 km from the turbine locations, namely Scheduled Monuments, Listed Buildings, Conservation Areas and sites on the Inventories of Gardens and Designed Landscapes and Historic Battlefields.

8.2.4.2 Site Walkover

A walkover of the site and its environs was undertaken on 15 November 2011. This was intended to examine the locations of identified heritage assets, identify any features not previously recorded, and appraise the potential for survival of significant below-ground archaeological deposits. Where the potential for a significant effect on a designated asset was identified, the feature was visited. In cases where the specific feature was not readily accessible, its setting was examined from publicly accessible roads and tracks.

8.2.5 Valuation of the Receptors in the Baseline Condition

SPP notes the variability in the capacity of heritage assets to accommodate change, and states that any planning decision should be based on a clear understanding of the importance of the heritage assets. Consequently, understanding this importance is central to developing an understanding of the potential effects of any development proposal.

In the case of designated assets, legislation and policy set out clear valuations of assets at international, national, regional (or ‘more than local’) importance. However, it is important to note that designations may not be entirely comprehensive, because:

- Designation is an ongoing process and not all features that could meet criteria for designation have necessarily been identified and considered;

- Designation reflects contemporary appreciation of assets and priorities for protection and understanding of individual assets may change over time; and
- Not all nationally important assets are necessarily eligible for designation.

Non-designated assets are more complex to value. They are of variable importance, although the vast majority of features have not been designated because they would not meet the necessary criteria, and are most appropriately considered of regional, local or lesser importance. Reference to published syntheses and research agendas can aid this understanding.

In addition, records in the WoSAS SMR comprise features that are known to exist, features which are known to have been lost, features whose present status is unknown, and features proposed on the basis of documentary or other desk-based analysis. In these cases, a definitive statement of value may not be possible. Consequently, professional judgement has been exercised in stating the importance of non-designated assets.

Table 8.2: Summary of Importance of Assets

Importance	Summary Rationale
International/National (High)	<p>By legal definition, scheduled monuments are considered as being of national importance. As the process of scheduling is ongoing, there are further features which are not scheduled but which may also meet the established criteria and may also be of national importance.</p> <p>All listed buildings are given equal protection by law and are of special architectural or historic interest, although the buildings are categorised, with category A (most important), B, and C(S). Category A listed buildings are described by Historic Scotland as of 'national or international importance'.</p> <p>Gardens and designed landscapes and historic battlefields recorded in the relevant inventories are, by statutory definition, of national importance.</p> <p>World heritage sites, while not specifically protected by legislation, are designated on the basis of 'Outstanding Universal Value' and are normally considered to be of international importance.</p>

Importance	Summary Rationale
Regional (Medium)	Archaeological sites which do not merit scheduling but which are nevertheless significant examples of their type in the regional context. Category B listed buildings are described by Historic Scotland as of 'regional or more than local importance'. Conservation areas are normally designated by local planning authorities and maintained on regional and district registers, and are therefore considered to be of local or regional importance.
Local (Low)	Archaeological sites or historic buildings which are of some interest in the local context, including category C(S) listed Buildings, described by Historic Scotland as of local importance.
Lesser (Negligible)	This includes sites where their presence is of some historical note, although the feature itself is of no intrinsic interest. An example of such a feature would be a modern quarry. Sites of lesser importance may also include those which have been extensively damaged or isolated artefact finds.
Unknown	Value of potential features is unknown

8.2.6 Methodology for Prediction of Effects

8.2.6.1 Direct Effects

The permanent land-take associated with intrusive elements of the proposed development, is likely to disturb any archaeological features, including those which are not currently recorded, that may be present in directly affected areas. Some of these elements of the proposed wind energy development would not necessarily cause disturbance to any archaeological remains present, as they may not need to intrude below topsoil level, or may be subject to micro-siting should an effect be identified. The assessment of direct effects has been undertaken by a comparison of the proposed development layout with the known and potential distribution of features of archaeological interest. Features relevant to this assessment are shown on Figure 8.2.

8.2.6.2 Indirect Effects

The potential for effects on the settings of designated assets within the ZTV has been assessed with reference to the site visit and the ZTV. The locations of sites were compared to a ZTV and wireframe visualisations prepared where it was considered that adverse effects could arise.

In this case, the magnitude of the effect is judged primarily in terms of changes to the nature of the setting of the specific feature caused by development, following the considerations set out by Historic Scotland⁵⁰. This is largely conditioned by the degree of intervisibility between the feature and the development in views both of and from the feature, which may be affected by such factors as distance, topography, and interposing vegetation or man-made features. Other factors, such as the policy weight attached to the designated feature, the inter-relationship of designated features and the value of the site for place-making are also important or can affect the capacity of the setting of an asset to accommodate change and have also been considered as appropriate. Recreation, amenity and leisure uses of designated heritage assets are considered within the LVIA separately to consideration of effects on their settings. In this context, it is also important to note the concept that visual effects and effects on setting are distinct such that the conclusion of a significant visual effect does not necessarily equate to a significant effect on a setting⁵¹.

Historic Scotland provide further guidance in *Scoping of Wind Farm Proposals. Assessment of Impact on the Setting of the Historic Environment Resource. Some general considerations* (2007) and *Managing Change in the Historic Environment: Setting* (2010) which set out general considerations to be addressed when understanding the extent, importance and sensitivity of the setting of an asset and assessing effects on that setting:

- The visual impact of the proposed change relative to the scale of the historic asset or place and its setting;
- The visual impact of the proposed change relative to the current place of the historic asset or place in the landscape;
- The presence, extent, character and scale of the existing built environment within the surroundings of the historic asset or place and how the proposed development compares to this;
- The magnitude and cumulative effect of the proposed change – sometimes relatively small changes, or a series of small changes, can have a major impact on our ability to appreciate and understand a historic asset or place;
- The ability of the landscape, which comprises the setting of a historic asset or place, to absorb new development without eroding its key characteristics; and

⁵⁰ Historic Scotland 2010

⁵¹ Electricity Act 1989; Town and Country Planning (Scotland) Act 1997: Report of Public Local Inquiry, Clyde Wind Farm, South Lanarkshire IEC/3/90, 9.75

- The effect of the proposed change on qualities of the existing setting such as sense of remoteness, evocation of the historical past, sense of place, cultural identity, spiritual responses.

The nature of the effect, i.e. positive, negative or neutral, of a wind farm development on the setting of cultural heritage assets is a subjective matter. Visibility of turbines from a heritage asset, even where clear and prominent, does not necessarily equate to a significant adverse effect⁵². Effects on setting are in general taken to have a negative effect as the turbines would generally constitute new and different elements to the setting of designated features that would be incongruous in terms of scale and appearance, to an imagined or interpreted 'contemporary' or 'original' setting or to their existing setting. However, this visual contrast in terms of design can also be taken as a factor that complements or provides a clear distinction between modern and historic landscape elements⁵³, and the presence of new features, such as turbines, could also have positive benefits for the viewer's ability to locate and identify distant and poorly visible features in terms of additional signposting in the landscape. Effects need to be understood in the context of specific proposals.

Any effects on the settings of designated features would occur during the construction and operational phases. Effects occurring during the construction phase would be primarily temporary and restricted to the period of construction, whereas the effects occurring during operation would be limited by the operational life of the wind farm, with the effects being largely reversed on decommissioning of the wind farm.

8.2.7 Significance Evaluation Methodology

Effects on receptors are assigned to one of four classes of magnitude, defined in Table 8.3, below.

⁵² The Electricity Act 1989; And The Town and Country Planning (Scotland) Act 1997 Report of a Public Local Inquiry into Two Applications for Wind Farm Developments: At Griffin, Ballinloan and Scotston Forest Estates; And at Calliachar IEC/3/65 and IEC/3/101, 10.45

⁵³ Electricity Act 1989: Report of Public Local Inquiry, Baillie wind Farm, Thurso IEC/3/105/3, 8.42

Table 8.3: Definition of Magnitude

Magnitude	Definition
Large	Total or substantial alteration of a feature or complete change to the characteristics of a feature's setting
Medium	Partial alteration of a feature. Substantial change to the key characteristics of a feature's setting, or a more total change which is temporary and/or reversible.
Small	Minor alteration of a feature. Change to a setting which does not affect the key characteristics, or which is short term and reversible.
Negligible	Minor alteration of a feature. Minor and short-term, or very minor and reversible changes to its setting which do not affect the key characteristics.
Unknown	Extent of potential change is unknown.

As noted above, the assessment of magnitude of an effect in EIA terms largely relies on professional judgement in the light of relevant legislation and policy rather than any scoring of criteria. With respect to potential effects on the setting of designated assets, the magnitude of an effect reflects the extent to which the contribution of the setting to the significance of the asset will be altered, judged against a range of factors.

Effects are considered to be significant or not significant according to the matrix below (Table 8.4). However, this matrix is used as a guide only and the assessment of the significance of an effect on a heritage asset is dependent on the exercise of professional judgement, as previously noted under 'indirect effects', above. Effects of a moderate or greater level would normally be considered to be significant within the terms of the EIA regulations.

Table 8.4: Establishing the Level of Effect**Importance of Receptor**

Magnitude of Change	National (High)	Regional (Medium)	Local (Low)	Lesser (Negligible)
	Very Substantial	Substantial	Slight/Moderate	Negligible
	Substantial	Moderate	Slight	Negligible
	Moderate	Slight	Negligible/Slight	Negligible
	No Effect	No Effect	No Effect	No Effect

8.3 Baseline Conditions

8.3.1 Current Conditions

8.3.1.1 Development Site Description, Geology and Historic Landscape Character

The underlying geology of this part of Bute is predominantly Devonian Old Red sandstone with scattered intrusive bands of basalt and dolerite. Superficial deposits of boulder clay exist within the west and south of the study area with relict raised beaches along the eastern coast of Bute⁵⁴.

There is no HLA (Historic Land-use Assessment) data available for the study area. The site is within agricultural land on a relatively low and undulating plateau, separated from the narrow and low-lying coastal strip by a steep hillside. Land within the study area is primarily in agricultural use, with some areas of forestry and the large water bodies of Loch Ascog and Loch Fad as well as the town of Rothesay. This agricultural landscape relates to the 18th-century improvement of the fertile southern half of the island by individual landowners, principally the Earls of Bute and Lord Bannatyne of Kames⁵⁵. These improvements have largely overwritten visible elements of earlier landscape use. Industrial activity increased during the 19th century, but was primarily focused on Rothesay and the coastal strip, although some elements of related infrastructure (such as Thom's Cuts, artificial watercourses taking water to the cotton mills in Rothesay) and small quarries are present inland⁵⁶.

8.3.1.2 Site History

Prehistoric Period (to c. 600AD)

There is very little specific evidence for prehistoric activity within the study area. There are antiquarian records of a standing stone at Bogany Wood (SMR 4987), but this has not been located in modern surveys, and dubiously located cist burials of the Bronze Age, which were at least partially removed by antiquarians near Windyhill Farm. An unidentified stone 'implement' (SMR 12714), now lost and of uncertain provenance was recovered from close

⁵⁴ Institute of Geological Sciences *Geological Survey of Great Britain (Scotland)* Sheet 29 Rothesay

⁵⁵ Geddes and Hale 2010, 41

⁵⁶ Geddes and Hale 2010, 43

to the supposed site of the cist burials. The wider survey of Bute carried out by the Discover Bute Landscape Partnership added little information pertinent to the study area⁵⁷.

Early Historic and Medieval Periods (c. 600 to c. 1600)

Again, very little is known about the use of the study area during this period. There are suggestions of a 'castle' at Ascog (SMR 5302), and while the SMR locates this close to Balmory House on the east-facing slopes above the Firth of Clyde, this location has not been confirmed. Similarly, a medieval coin hoard from Kingarth (SMR 5298) can only be approximately located. The RCAHMS records Hewison's suggestion that the name Ascog relates to an Old Norse formation meaning 'boat – mound'⁵⁸, and is suggestive of the presence of a boat burial in the area, although this name has more recently been taken as either an Old Norse/Gaelic compound meaning 'ship – bay' or a wholly Gaelic 'ash – bay'⁵⁹. Given the relative scarcity of material evidence for Norse occupation of Bute, the Gaelic place name seems substantially more likely.

Post Medieval and Modern (c. 1550 onwards)

The first map to show the study area in any detail is Roy's Military map of 1747 to 1755. This shows the site as cultivated and open land on the southern side of the Hill of Ascog, between the settlements of Upper Ascog, Tayvalley and Mid Ascog to east, west and south of the site respectively. Earlier county maps, such as Pont (1583 to 1601) or Blaeu (1654) show only very schematic depictions of the area that do not provide any meaningful information. Thomson's Atlas (1832) shows no further information; it is not clear whether the smaller farmsteads had been cleared by this point or whether they were too insignificant to show on the map. The first edition Ordnance Survey 25" – 1 mile mapping (1855) shows the site as farmland, enclosed by linear field boundaries characteristic of improvement period enclosure. The Old Statistical Account for Kingarth⁶⁰ notes that almost all of the agricultural land in the south of Bute had been enclosed by the end of the 18th century, and the New Statistical Account notes both the rural depopulation and the concentration of land ownership that frequently accompanied this movement towards enclosure⁶¹.

The second edition Ordnance Survey 25" - 1 mile mapping (1896) shows a small sub-circular wood at the summit of the Hill of Ascog. The first edition 10" - 1 mile shows only a

⁵⁷ Geddes and Hale 2010

⁵⁸ Hewison, J. K. 1893-5 *The Isle of Bute in the Olden Time*

⁵⁹ Mac An Tàilleir, I. 2003 *Gaelic Place Names A-B*. Parlamaid na h-Alba

⁶⁰ The Statistical Account of Scotland 1791-9, Volume 1, 309

⁶¹ The New Statistical Account of Scotland 1845, Volume 5, 89

field boundary, suggesting that the wood had been laid out as a late-19th century landscape 'improvement' at that date but had not matured. There is no sign of the settlements of Upper Ascog or Tayvalley, although Ascog farm is likely to have been built on the site of the earlier farmstead of Upper Ascog shown by Roy. To the east of the site, a number of substantial detached houses are shown on the east-facing hillside, including Ascog Hall and Balmory House; the new statistical account notes that these were generally built before 1845, though it has also been suggested that this development is principally late 19th century in date⁶². These houses appear to have been located to take advantage of the extensive views to the east across the Clyde, and are screened with shelter belts in addition to the natural screening afforded by the rising ground to the west. In that the field boundaries of Ascog farm were formerly marked with cast-iron fence posts, a material more common in designed landscapes and in the mid-late 19th century, it is likely that a certain degree of improvement of the farmland associated with the high-status settlement along the coast took place, and the tree-ring at the summit of the Hill of Ascog is consistent with this context of picturesque landscape enhancement. Subsequent editions of the Ordnance Survey mapping show only detail changes within the site.

8.3.1.3 Designated Heritage Assets

World Heritage Sites

There are no World Heritage Sites within the extended study area.

Scheduled Monuments

There is a wide variety of Scheduled Monuments within the extended study area. These include the prehistoric hill fort at Barone Hill, medieval castles at Rothesay and Toward, St Mary's Chapel at Rothesay and the post-medieval Thom's Cuts, water channels designed to feed the textile industry, one of which is the closest scheduled monument to the site. Rothesay Castle and St Mary's Chapel, Rothesay are both Properties in Care of the Scottish Ministers.

Gardens and Designed Landscapes

There are two Gardens and Designed Landscapes within the extended study area, at Mount Stuart, 2 km south of the site and Castle Toward, 4.5 km north of the site.

⁶² Geddes and Hale 2010, 45

Listed Buildings

There are over 350 listed buildings within the extended study area, the closest of which to the site is the Category B listed Meikle Ascog. Despite the large number of listed buildings within the extended study area, the proposed development is located within a relatively sparsely settled area and there are relatively few listed buildings outside the narrow strip of relatively level ground and lower slopes of the eastern side of Bute, which includes the centre of Rothesay. Listed Buildings within the extended study area are listed at Appendix G.

Historic Battlefields

There are no designated historic battlefields within the extended study area.

Conservation Areas

There are two Conservation Areas within the ZTV, at Kerrycroy 1.8 km south of the site and at Rothesay, at its closest (at Ascog) 400 m east of the site.

8.3.1.4 Non-designated Heritage Assets and other Features of Interest

Non-designated Heritage Assets

The WoSAS SMR notes the presence of a number of features, primarily related to the agricultural use of the study area during the post-medieval and modern periods. The few records of earlier features relate to dubiously located and poorly understood prehistoric and medieval features.

Features Identified during this Assessment

No new historic environment features were identified within the site as a result of the site walkover. The site comprised rough pasture with occasional outcrops of rock. The ground surface was generally uneven, although there was no trace of any coherent earthworks or visible structures suggestive of an archaeological origin.

The only previously identified heritage asset on or within close proximity to the site was the ring of trees⁶³ at the summit of the Hill of Ascog. This comprises a circle of mature broadleaf

⁶³ Tree rings and plantation banks are relatively well-known though poorly understood landscape features. In their present form, they appear to relate almost entirely to agricultural or picturesque landscape improvement, though a possible correlation with earlier ceremonial features has been postulated (O'Hare, M. WoSAS in litt 31 January 2011)

trees, some of which have recently been blown over by storms. This had exposed the underlying soil coverage, which comprised a thin (50 to 100 mm) depth of sandy soil overlying brash bedrock. The 'mound' contained within the tree circle comprised a number of irregular mounds with variable depths of soil coverage. These appeared to be similar in form and derivation to the larger outcrops of bedrock to the south, and are most likely to represent outcrops of natural stone.

The field boundaries closest to the site had apparently included cast-iron post and rail fences that had been originally used during the 19th century, but which had fallen into disrepair and have been entirely replaced by wooden post and wire fencing⁶⁴.

The proposed site of the former settlement of Tayvalley is separated from the site by substantial rocky outcrops. These form a significant landscape feature which supports Roy's depiction of this settlement as entirely to the south and west of the road.

8.3.2 Valuation of Heritage Assets

8.3.2.1 Potential Receptors of Direct Effects

There are no identifiable heritage assets within the site boundary that are likely to be affected by the proposed Ascog Wind Energy Project. There is a theoretical possibility that previously unrecorded heritage assets pre-dating the post-medieval period may be present within the site, but the topographic and geological situation of the site suggests that any past use of the site is unlikely to have left substantial archaeological traces. While it is also theoretically possible, though unlikely, that the mounds within the tree ring at the summit of the hill of Ascog could represent surviving elements of an anthropogenic mound, the wind energy project as proposed would entirely avoid this feature and the presence of such mounds on the site do not presuppose the presence of associated features.

8.3.2.2 Potential Receptors of Indirect Effects

The potential receptors of indirect effects comprise a number of designated assets whose importance is set out within legislation and policy. These assets are predominantly listed buildings and have therefore been considered to be of local, regional or national importance for the purposes of the assessment. Where discrete groups of assets that share common characteristics have been identified, these have been considered together.

⁶⁴ McVey, J. pers. comm.

There are a number of designated assets within the extended study area. However, given the nature of the study area, many of these have either restricted views to the site or have settings which do not have well defined visual or associative links to the site. Elements of turbines are likely to be visible from many of the designated assets within the extended study area only as distant features in the background to their setting in minor views of or from these assets, or would not be visible at all. In these cases any effects would be of negligible magnitude and have not been considered further.

The non-designated assets within the study area were reviewed to identify any which were potentially of national importance, though not at this date, designated. No such assets were identified, and the effect on the settings of non-designated assets has not been considered further.

A description of the current settings of designated assets identified within the scoping response or identified as potentially subject to adverse effects is set out Table 8.5, together with an assessment of their importance and a summary rationale for their inclusion or exclusion from further assessment. Individual assets which are included within the asset groups are listed in Appendix G.

No non-designated assets which have the potential for significant adverse indirect effects to arise have been identified.

Table 8.5: Rationale for Selection of Assets for Assessment

Asset or Asset Group	Importance	Distance from Site	Included within Assessment	Rationale
Listed Buildings at Ascog	Local-Regional	500 m to 1.6 km	Yes	Some of these assets are outwith the ZTV and all will have restricted views to the site given the underlying topography and intervening planting. Assets in this group that are prominently visible and in close proximity to the turbines may be affected.
Balmory House	National	500 m	Yes	Asset is in close proximity to turbines and is identified in consultation response.
Listed Buildings in Rothesay Conservation Area at Rothesay	Local-National	1.2 to 2.5 km	No	Assets' settings are determined by relationship to immediately surrounding built environment and relationship to the Firth of Clyde. Many of these buildings are largely outwith the ZTV, and turbines will only be visible in a small number of glimpsed or peripheral views which would not affect the relationship of assets to their settings.
Listed Buildings in Rothesay Conservation Area at Port Banntyne	Local-National	2.8 to 4.8 km	No	Assets' settings are determined by relationship to immediately surrounding built environment and relationship to the Firth of Clyde. Turbines may be visible in a small number of glimpsed or peripheral views which would not affect the relationship of these assets to their settings.
Rothesay Castle	National	1.6 km	Yes	Specific consultee request. Asset is largely outwith the ZTV, but turbines may be visible in views of the asset from the north-west

Asset or Asset Group	Importance	Distance from Site	Included within Assessment	Rationale
High Kirk of Rothesay and St Mary's Chapel	National-Regional	1.5 km	No	Assets are outwith ZTV of development and have no demonstrable associative connection with the site
Thoms Cuts	National	1.5 to 4.9 km	No	Settings of assets are spatially restricted and these assets pass through a variety of variously altered landscapes. Visibility of turbines will not affect these settings.
Listed Buildings at Kerrycroy Conservation Area	Regional	1.7 to 2 km	Yes	Turbines unlikely to be visible from these assets but may appear behind assets in views from the quay.
Listed Buildings at Loch Fad	Local-Regional	2.7 to 3 km	No	Settings of assets are spatially restricted and visibility of turbines as elements to the background of their setting will not affect these settings.
Barone Hill Fort	National	3 km	Yes	Turbines will be located outwith the setting of the asset and will not be visible in views of the asset, but will be visible in views from the asset to the east.
Listed Buildings and designated designed landscape at Mount Stuart	Local-National	3 to 4.8 km	Yes	Specific consultee request. Views of turbines are likely to be substantially screened from these assets, and their settings are defined by their location within the designated landscape, but intrusion of turbines into designed views could give rise to adverse effects

Asset or Asset Group	Importance	Distance from Site	Included within Assessment	Rationale
Castle Toward GDL and associated listed Buildings	Regional-National	4.2 to 4.7 km	No	Setting of assets determined by location within designed landscape and by relationship with Rothesay Bay/Loch Striven/Firth of Clyde. Visibility of turbines as distant background features will not affect this setting.
Listed Buildings at Milton Farm Kilwhinleck Farm and Stewart House	Regional-National	4.0 to 4.6 km	No	Assets are outwith the ZTV and turbines will not be visible in views of the asset.

Assets which have been identified as potentially being subject to significant effects have been considered in more detail. Table 8.6 sets out the description of the existing baseline in terms of the characteristics, appearance and of the settings of individual assets or groups of assets and the contribution of those settings to the importance of those assets. This information has been used both to inform the baseline against which changes arising from development have been considered and to understand the how those changes will affect the assets concerned.

Table 8.6: Key Attributes of Settings of Designated Assets

		Listed Buildings at Ascog	Balmory House	Rothsay Castle	Kerrycroy Conservation Area	Barone Hill Fort	Listed Buildings and Designated Landscape at Mount Stuart
Location	Topography	On east facing hillside and along level ground along coast	On slight plateau on east-facing hillside	On level ground at base of steep-sided valley	On level ground on coastal strip	Aligned along hill-top ridge	Within rolling landscape generally trending down to the east
	Screening	Buildings on hillside are within woodland, some screening afforded by underlying landform	Dense and mature woodland/shelter planting to hillside between asset and site	Surrounding built development and underlying topography of hillside between asset and site	Dense woodland on hillside between assets and site	None	Dense park woodland and wooded hillsides between asset and site
	Landscape context	Within low-density development stretching away from outskirts of coastal settlement;	Within low-density development stretching away from outskirts of settlement with woodland and farmland to west of asset	Within town centre with some links to sea	Located on coastal strip adjacent to but clearly outside designed landscape	On craggy hilltop within moorland and woodland	Within designed landscape
	Other		Some more recent development within setting to the south of asset	Modern development obscures, but does not erase traces of past functional	Sinuous line of coastal road, underlying topography and planting create a		

		Listed Buildings at Ascog	Balmory House	Rothsay Castle	Kerrycroy Conservation Area	Barone Hill Fort	Listed Buildings and Designated Landscape at Mount Stuart
				linkage to coast	setting which is enclosed on three sides, with open views only to the east		
Scale, Massing and Prominence	Proximity	500 to 1.6 km from turbines	500 m from turbines	1.6 km from turbines	1.7 to 2 km from turbines	3 km from turbines	3 to 4.8 km from turbines
	Prominence	Individual assets clearly visible in close views; longer views are of a group of scattered buildings	Prominent only in very close views from within grounds or immediately adjacent	Prominent only in very close views due to density of surrounding development.	Prominent only in close views; visible as	Asset difficult to identify even in close views, underlying hilltop a prominent feature	Individual assets prominent in close range revealed views, but largely screened in longer views. Parkland clearly discernible from surrounding landscape in close views, but merges with other planting in long views from the east.
	Scale	Scattered larger domestic buildings	Large domestic building	Large castle	Small project of domestic buildings	Enclosed area on hilltop	Designed parkland landscape
	Non -visible characteristics	Associations with 19th century	Associations with 19th century	Associations with past strategic	Functional and associative links to		Associations with regional elite

		Listed Buildings at Ascog	Balmory House	Rothsay Castle	Kerrycroy Conservation Area	Barone Hill Fort	Listed Buildings and Designated Landscape at Mount Stuart
		industrial prosperity of the Clyde region	industrial prosperity of the Clyde region	importance of Bute.	Mount Stuart designed landscape		
Design	Formal design values	Formal design values reside in individual assets	Formal design values reside in architectural scheme of house and relationship with grounds	Formal design values reside in architectural composition of the castle	Formal design values reside in individual structures and their composition as a designed group	Asset insufficiently visible to distinguish except in very close views.	Formal design values reside in the individual assets and their placement within the designed landscape.
	Fortuitous aesthetic values	Combination of assets within piecemeal development combines to give sense of place	Combination of assets within piecemeal development around Ascog combines to give sense of place	Asset visible in revealed and channelled views enhance perceptions of its scale and relationship with the town	Strength of design precludes fortuitous values	Asset insufficiently visible to distinguish except in very close views.	Strength of design precludes fortuitous values
	Visual harmony or congruity	Buildings generally of consistent date, style, scale and materials	Style, materials and scale consistent with other structures at Ascog	Scale and style of asset contrasts with surrounding development	Buildings of consistent date, style, scale and materials by design. Contrasts with regional styles	Asset insufficiently visible to distinguish except in very close views.	Assets within park combine to create diverse but coherent scheme. Contrast in short views between

		Listed Buildings at Ascog	Balmory House	Rothesay Castle	Kerrycroy Conservation Area	Barone Hill Fort	Listed Buildings and Designated Landscape at Mount Stuart
					and landscape.		parkland and surrounding landscape
Access	Public appreciation/access	Access via public roads and paths	Restricted access to land immediately outside grounds	Access available to asset	Access to assets along public and estate roads	Access possible but only over difficult terrain	Public access available at specific times

8.3.2.3 Trends and Projected Future Baseline

In the absence of the proposed development it is unlikely that further significant changes to the existing baseline would occur in the short to medium term.

8.3.2.4 Information Gaps

In that no intrusive fieldwork has taken place, it is not possible to definitively state the potential for archaeological features to be present on the site, although the information that is available suggests that this potential is severely restricted.

8.4 Predicted Impacts

8.4.1 Direct Effects

Direct effects on heritage assets occur through direct physical disturbance or removal of archaeological remains, deposits of palaeoenvironmental or geoarchaeological significance or historic structural fabric. The potential for such effects and their severity are conditioned by two principal factors:

- The location of known features and the potential for previously unrecorded features to be present; and
- The extent of any intrusive groundwork associated with the wind energy project.

8.4.2 Indirect Effects

Indirect effects of heritage assets arise through either change to the setting of a heritage asset, or through changes outside the setting which affect the importance of that asset, for example by intervening in a key view from the asset or by challenging or reducing the prominence of an asset which forms a key element of historically significant views.

These effects are conditioned by a number of factors which have been discussed in more detail at Section 8.2.5.

8.4.3 Short Term Impacts

8.4.3.1 Indirect Effects Arising from Construction and Decommissioning of the Wind Energy Project

The increased visual prominence of the proposed wind energy project during construction arising from the presence of site plant including cranes, the construction of new tracks and temporary storage of turbine components would represent small and short-lived increases to the overall operational effect, and will be restricted to the duration of the construction and decommissioning programme. Temporary increases in the magnitude of effects would not, in themselves, give rise to significant effects, and consequently, these short-lived effects have not been considered further.

8.4.4 Reversible Impacts

8.4.4.1 Indirect Effects on the Settings of Designated Heritage Assets

Indirect effects arising from the construction of the proposed Ascog Wind Energy Project are restricted to the operational life of the wind energy project and may arise as the result of the effect of the proposed development on the settings of off-site designated heritage assets. These effects are entirely reversible on the decommissioning of the proposed wind energy project at a date governed by any planning consent.

Listed Buildings at Ascog

Existing Setting and Importance

The listed buildings at Ascog comprise a number of substantial high-status houses built during the 19th century, largely for wealthy Glasgow businessmen and landowners; these are largely Category B listed and of regional importance, although Balmory House is listed at Category A and is of national importance. These houses were designed to take advantage of the relative proximity to Glasgow and, presumably, the landscape situation overlooking the Firth of Clyde. As is consistent with the date of their construction, their settings afford a high level of privacy and enclosure, with screening planting preserving clearly demarcated plots and landholdings. The settings of individual buildings are defined by their associated grounds and relationships with immediately adjacent structures. Taken as a group, the setting of these assets comprises the narrow coastal strip and the lower slopes of the hillside on which buildings have been constructed. All of these buildings are separated from the more open farmland of the interior by dense planting to the hillside above the coast road,

which serves both to screen them from views except in very close proximity and to preclude any longer views to the west.

These buildings were designed to reflect the wealth and status of their inhabitants, but primarily from relatively close proximity in intimate revealed views as invited guests and visitors approached the houses. Consequently, their prominence in views from the coast road is restricted. How far the visibility of these houses from the Firth of Clyde reflects deliberate design, and how far it reflects the need to provide views back to the east from these houses is largely a matter for conjecture. At the separations involved, views of these houses from the Clyde and the mainland do not allow the individual architectural values of these houses to be truly appreciated, and they are seen more as a projected grouping.

Change Resulting from Development

The proposed turbines would be located outside the settings of these assets and are unlikely to be visible from the majority of these assets as a result of the screening provided both by the existing land form and by the extensive tree planting around these assets. The turbines are similarly unlikely to be visible in the majority of close views of these houses given the extent of screening afforded by the existing landform and the density of the woodland around these houses.

In general, turbines are only likely to be visible in simultaneous views with these listed buildings in longer views from the mainland and the Clyde estuary. In these cases, the turbines would be separated from the assets by the hillside and woodland, and the turbines would neither overwhelm nor detract from any sense of place or architectural interest that these buildings may have. This visibility would present a negligible magnitude of adverse change and would not give rise to a significant effect.

Balmory House

Existing Setting and Importance

Balmory House has been identified as a particularly sensitive receptor during consultation, and although its setting shares the characteristics of the other listed buildings along the hillside at Ascog, it is appropriate to consider any effects that may arise in more detail. Balmory House is set on a slight plateau on the hillside above the Ascog shoreline, with extensive woodland and shelter planting to all sides, although the slight fall in ground level to the east means that the upper windows of the house afford a view over the Clyde. It is approached from the north-east along a sinuous and screened approach which screens

views of the house until the viewer arrives at the carriage entrance on the north side of the House. There are views of the frontage of the house set against a background of dense screening planting and the underlying hillside to its west. Its setting is restricted to its garden and the lane immediately to the east, with the dense screening planting restricting views out of the immediate surroundings of the house, although views to the sea make a positive contribution.

Change Resulting from Development

The proposed turbines would be located outside the setting of the asset and are unlikely to be visible from the house and grounds at ground level. Upper elements of the turbines may be visible in filtered views from upper windows at the rear of the house, although the contribution of these views to the importance of the house is restricted. Turbines are also unlikely to be visible in close views of the frontage of the house, becoming visible only in oblique views of the house from the south east and in longer views in which the prominence of the asset is substantially reduced and the viewer would have to actively search for a distant and heavily filtered view of the House. It should also be noted that the consultation responses related to an earlier iteration of the wind energy project in which a fourth turbine was located due west of the house, and which would have appeared in close proximity if not direct juxtaposition with the house close views, and the removal of this turbine from the layout has substantially increased the visual separation of the turbines from Balmory House in longer views. These changes would present a low magnitude of change which would not give rise to a significant effect.

Rothsay Castle

Existing Setting and Importance

Rothsay Castle is designated as a Scheduled Monument and as a Property in Care of the Scottish Ministers; it is of national importance. It is located within the centre of the Rothsay conservation area and forms a dominant presence within the town centre. Its setting is almost entirely determined by its relationship with the immediately surrounding built environment, with its visibility dropping off rapidly in the narrow and winding streets of the town. The view to Rothsay harbour, channelled by the line of High Street retains the connection with the sea that was the reason for the castle's siting. The contribution of longer views from the asset is primarily to enhance the sense of place in an enclosing landscape bowl to the south and west. The few available views of the castle from this higher ground provide a vantage point from which its relationship with the town plan can be better appreciated.

Change Resulting from Development

Upper elements of the proposed turbines would be visible only from elevated parts of the castle in views that are heavily filtered by the existing landform and built environment. Views from street level and ground level within the castle would be precluded by intervening development. The proposed turbines may be visible behind the castle and town in a small number of views from higher ground to the north-west of the castle (even here, intervening development screens many such views), but would be separated from the castle by the extent of the built environment round it and by the farmland and woodland beyond.

The proposed turbines would be located outside the setting of Rothesay Castle, and would neither intrude on any views to related heritage assets nor substantially detract from any sense of place or understanding of the placement of the Castle. Consequently the magnitude of adverse change would be negligible and would not give rise to a significant effect.

Listed Buildings at Kerrycroy*Existing Setting and Importance*

The buildings at Kerrycroy Village form a distinctive and coherent group of estate buildings associated with, but standing just outside the designated parkland at Mount Stuart. As Category B listed Buildings, they are of regional importance. The houses are arranged in a crescent, mirroring the form of the bay immediately to their east. Their setting is the narrow strip of level ground between the foot of the hill and the coast, with the dense planting to the north and west of the assets and to the boundary of Mount Stuart to the south forming substantial perceptual limits to the setting. The existing land from and woodland restricts visibility of and from these houses, except towards the Clyde, and the only visible association with the Mount Stuart estate is the estate wall and the gateway adjacent to the quay which projects into the Clyde.

Change Resulting from Development

The turbines would be located outside the setting of these assets. Views towards the turbines from the designated houses would be screened by the existing topography and intervening woodland. Turbines are also unlikely to appear in close views of the assets, and more distant views from the south and east which might juxtapose the turbines with these houses are precluded by the presence of the planting to the edge of the Mount Stuart designed landscape. It is, however, possible that those upper elements of turbines may

appear in heavily filtered views back to the houses from the quay, although in this case, the turbines would be separated from the houses and would represent a minor element of the background to their setting. This would represent an adverse change of negligible magnitude and would not give rise to a significant effect.

Garden and Designed Landscape and Listed Buildings at Mount Stuart

Existing Setting and Importance

The Garden and designed landscape at Mount Stuart is a particularly important example of coherent 18th and 19th-century parkland. The designated landscape is of national importance, and while many of the designated assets within it are formally of regional or local importance, they have been considered as a group of national importance for the purposes of this assessment. It provides the setting for a number of listed buildings, including the Category A listed Mount Stuart House. The existing layout of the parkland comprises a design which has evolved from the early 18th-century. The basic woodland planting scheme appears to have been in place by the mid 18th century and to have been maintained and enhanced during the 19th century, with the redesign of gardens immediately round the house reflecting changing tastes during this period. The parkland provides the setting for the designated assets within it. The setting of the parkland itself is the shallow area of relatively low-lying ground towards the south-east edge of the island. The dense woodland and hedgerow planting in this area combines with rising ground to the north and west to restrict the spatial extent of the setting to the agricultural land immediately surrounding the park and adjacent related assets, such as Kerrycroy Village.

The overall effect of the designated parkland is of enclosure and seclusion; there are no long views out of the parkland except towards the Clyde, and even the upper storeys of the house are screened by the density and height of the woodland plantation. The key views of the house are from the east, looking back over the former parterre, and the most used approaches are from the north and west. The principal avenues within the parkland, the Limetree Avenue and the Forty Five avenue are aligned north-east to south-west and north to south respectively. Other avenues within the parkland are more sinuous and do not capture longer views. The parkland is discernible in long-distance views from the Clyde and the mainland, although the dense woodland of the estate tends to merge with the woodland on the slopes above the eastern coast of Bute.

Change Resulting from Development

The proposed Ascog Wind Energy Project would be located outwith the setting of the designated landscape and the buildings within it. Visibility of the proposed turbines from within the parkland at ground level would be severely restricted and while the possibility of views towards the turbines from some areas of the park cannot be excluded, particularly from the more open and elevated areas of parkland behind Mount Stuart House, turbines would not be visible from the majority of the parkland, including the core focal points around the house and would not intrude into the key views towards the house and other designated features within the parkland. They would also not appear in views framed by avenues of trees. Where the turbines are visible, they would appear in views filtered by the existing parkland planting and the rising ground to the north and west of the gardens. The turbines would be visible in simultaneous views of the parkland from the Clyde, but would be separated from these assets by a substantial distance and would not detract from the prominence of the parkland in the view. The magnitude of adverse change to individual assets within the parkland would vary from negligible to no effect, but the effect on the setting of the designated landscape as a whole would present an adverse change of low magnitude and would not give rise to a significant effect.

Barone Hill Fort*Existing Setting and Importance*

Barone Hill fort is a scheduled monument and is of national importance. It comprises a sub-oval earthwork traversed by a post-medieval or modern wall. The hill top on which it is located is a prominent topographical feature, although the fort earthworks are less clearly visible. The date and exact nature of the fort is unknown, and while it is tempting to place it within the context of the Iron Age hill forts more in the mainland lowlands, it may also relate to the tradition of Bronze Age 'fortifications' more common on the west coast of Scotland. Its setting comprises the hill on which it is located and its immediate surroundings. Longer views from the asset contribute towards its importance, but these are primarily the fortuitous result of its location at a hill top rather than the result of any functional or designed purpose. There are no known functional or associative links between the Barone Hill fort and other summits within Bute.

Change Resulting from Development

The proposed Ascog Wind Energy Project would be located outside the setting of the asset. The proposed turbines would be clearly visible in views from the asset, but are unlikely to appear in views of the asset except in very distant views from elevated locations on the east

side of Kintyre and the Kyles of Bute, in which the asset (as opposed to the summit on which it is located) is unlikely to be discernible. In views from the asset, the proposed turbines would occupy a relatively small proportion of the background to the setting, would not dominate or compete with the asset for prominence and would present an adverse change of low magnitude. No significant adverse effect would arise.

8.4.4.2 Cumulative Effects

There are no operational, consented or submitted wind energy development proposals within sufficient distance of the proposed Ascog Development to give rise to any significant cumulative effects. The closest such developments to the site are located on the mainland at distances of 11 km and over from the site centre. This spatial separation and their presence in an entirely separate historic landscape context is such that these turbines would not present a sufficient magnitude of change to give rise to effects of greater than negligible magnitude.

8.4.5 Long Term Impacts

8.4.5.1 Direct Effects on Archaeological Features

Direct effects on archaeological heritage assets are those caused by physical disturbance or damage (Section 8.4.1). These effects are permanent and irreversible, but can be mitigated through avoidance by design or permitted flexibility within the wind energy project or can be offset through the creation of a record of features which are disturbed.

There are no known assets which would necessarily be affected by the proposed development, although there is a tree-ring (SMR 19159) close to Turbine 1, which has the potential to be inadvertently damaged during construction of this turbine.

The potential for archaeological features to be present within the site is difficult to assess. While the paucity of records of archaeological features within the study area is undoubtedly conditioned by the absence of detailed archaeological work in the area, comparative evidence from other parts of Bute suggests that archaeological heritage assets are likely to be relatively sparsely distributed and the site is located away from the more densely occupied coastal strip. The underlying geology and recorded former land use of the site suggests that substantial remains of any past activity are unlikely to be present. It is unlikely that occupation or use of the site before the post-medieval period has left any lasting

archaeological remains, and consequently adverse effects on archaeological heritage assets are unlikely to arise from the proposed Ascog Wind Energy Project.

8.5 Mitigation Measures

The principal measure adopted by the wind energy project to reduce the effect on the historic environment has been the design iteration which resulted in the omission of the fourth turbine from the original wind energy project. This turbine was located over the site of a recorded settlement at Tayvalley and was located such that it was likely to appear in views of the main frontage of Balmory House. Removing this turbine has resulted in a substantially reduced direct effect on known and potential previously unrecorded archaeological features and has minimised the indirect effect on the setting of Balmory House.

As presently proposed, mitigation of the potential direct effects of the wind energy project can be best achieved by providing for the identification of the tree ring at the summit of the hill of Ascog in work instructions and allowing for it to be fenced for the duration of the construction works to minimise the potential for inadvertent damage.

Mitigation of the potential indirect effects of the wind energy project is harder to achieve. In that the principal characteristics of the assets which may be affected relate to appreciation of their aesthetic or architectural interest, no specific additional measures which would adequately mitigate these effects have been identified.

8.6 Significant Residual Effects

No significant residual effects have been identified. The greatest magnitude of change in respect of any of the identified receptors is an adverse change of low magnitude, which is insufficient to give rise to significant effects in any case.

8.7 Summary of Findings and Significant Effects

After mitigation, no adverse direct effects are considered likely to arise. There is no evidence for any past activity within the site other than post-medieval agriculture. Suggestions that the tree-ring may enclose a mound of early-medieval or earlier date remain conjectural and against the indications of more recent Gaelic place-name studies and the physical appearance of the mounds. The tree ring appears to be a Romantic addition to the landscape, set in place in a wider context of agricultural improvement. In any event, this

feature is unlikely to be affected; particularly once mitigation proposals to prevent inadvertent damage are in place. There is no evidence for any previously unrecorded archaeological features to be present on the site, and aerial photography, the underlying geology and topographic situation suggest that this absence of evidence derives from a real absence of past activity rather than any absence of previous study.

The potential for significant indirect effects is largely conditioned by the topography of the study area, the extent of planting on the lower slopes of the coastal hill side and the focus of settlement along the coastal strip from Ascog north through Rothesay and into Port Bannatyne. These factors combine to restrict the settings of the identified designated heritage assets and to reduce visibility of the proposed turbines from these assets. In general, views to the turbines from designated assets would be restricted to filtered or distant views of turbines in the periphery of minor views to and from designated assets. Some adverse effects are expected to arise, but these would not be significant, and would in any case be restricted to the operational life of the proposed wind energy project.

9 LAND USE AND AGRICULTURE

9.1 Introduction

This Chapter presents an assessment of the predicted impacts of the proposed wind energy project development on land uses (including recreation) and agriculture. It presents the impacts of the construction and operation of the development on the site and its productive agricultural use, together with mitigation measures to avoid or reduce significant effects.

9.2 Approach

9.2.1 Scope and Consultation

The assessment and evaluation of impacts has been developed based on the overall project impact assessment methodology which is presented in Chapter 2 of this ES. The sensitivity of the baseline environment of the site has been defined taking account of a range of factors including designations, land quality and agricultural use. On the basis of the baseline conditions described in Section 9.3, the site is considered to have a low sensitivity to change from the perspective of land use and agriculture. The magnitude of impacts on land use and agriculture has been assessed in this Chapter with respect to the following criteria.

Table 9.1: Magnitude of Impact

Magnitude of Impact	Description
High	<ul style="list-style-type: none"> • A permanent restriction on the choice or level of land operations, access to them, and/or requiring major management adjustments • Potential for substantial changes to environmental agreements • Permanent and large interruption to recreational facilities or patterns
Medium	<ul style="list-style-type: none"> • A temporary restriction on the choice or level of land operations, access to them, and/or requiring moderate management adjustments • Potential for changes to environmental agreements • Permanent interruption to recreational facilities or patterns
Low	<ul style="list-style-type: none"> • A temporary restriction on the choice or level of land operations, access to them, and/or requiring small management adjustments • Potential for minor changes to environmental agreements • Permanent but minor interruption to recreational facilities or patterns
Negligible	<ul style="list-style-type: none"> • Negligible change to any of the above factors

The criteria presented in Table 9.1 have been derived from SAC's experience and involvement in a range of previous EIA projects involving changes in land use and agriculture in the absence of definitive criteria or legislative standards. Significant environmental effects are evaluated where an impact of high magnitude has been predicted on the baseline environment which has been characterised as being generally of low sensitivity.

The following sources of information have been used in the assessment:

- Responses from consultation, including scoping responses received with the scoping opinion of 21 January 2011;
- Ordnance Survey Mapping, site visits and satellite photography;
- Macaulay land capability for agriculture maps at 1:50,000 scale;
- SNH Site Link interactive map; and
- Argyll and Bute Local Plan and Local Development Plan.

The above sources were supplemented with discussions with the owner and manager of Ascog Farm.

9.2.2 Regulations, Policy and Guidance Context

The proposed development site crosses land designated as Sensitive Countryside and land designated as Rural Opportunity Area in the Argyll and Bute Local Plan. The extent to which the proposals will accord with the sensitive countryside are likely to be determined in more detail by Argyll and Bute Council through an Area Capacity Evaluation which will take account of the landscape assessments presented in this ES (see Chapter 7).

Since no significant negative effects on recreation, amenity and agriculture are predicted, the wind energy project proposals are considered to be generally in accordance with relevant policies in the Argyll and Bute development plan.

9.3 Baseline Conditions

9.3.1 Land Use

The proposed development site (OS grid square NGR NS1063) for the wind energy project is located on the eastern side of the Isle of Bute on elevated ground known as the Hill of Ascog which lies around 2 km south east of the centre of the main town of Rothesay. The

site overlooks the coastal settlements around Ascog Bay on the eastern side of the southern part of Bute.

The site is generally formed on the gently sloping south eastern side of the Hill of Ascog reaching to a height of approximately 100 m AOD at its highest point and approximately 55 m at its lowest point. The proposed development site is located on undeveloped grassland which slopes downhill from the north west to the south east. The southern part of the site crosses two large fields of improved grassland which form part of the land holding at Ascog Farm (see Section 9.3.2). The northern part of the site is located on grassland which is interspersed with gorse which lies between the enclosed fields to the south and the edge of the Hill of Ascog to the north.

The western and north western edge of the site lies within 100 m of the steep and wooded north west facing slope which forms the edge of the area of volcanic rock which comprises Hill of Ascog (see Chapter 10 for geology baseline). To the west of the site, on lower ground at the foot of the steep slope lies Loch Ascog which is a reservoir providing a drinking water supply for the town of Rothesay. A covered reservoir is located at the dammed northern end of the loch and a small sewage treatment works is located around 400 m to the north of the reservoir, along the edge of the steeply wooded slope below Hill of Ascog. Much of the land north of the Hill of Ascog to the settlement boundary of Rothesay is occupied by the open space of Rothesay Golf Club.

East of the site the land slopes downhill across improved grazing land to a line of formal deciduous woodland associated with the policies of Ascog House and Ascog Farm. The closest public road access to the site is formed by a C class road from the southern end of the site which connects the A844 coastal route to the south of Ascog with Rothesay to the north.

Although the area around the proposed site is not heavily developed there are a number of residential properties close by. Most properties in the vicinity of the proposed site are located below the raised cliff forming the coastal edge of Bute in the settlement area of Ascog although there are also scattered houses to the north and west. A schedule of properties identified within 500 m of the site is presented in Section 9.4.

There are no formal trails or rights of way across the site. This part of Bute is not heavily used for formal recreation, the nearest visitor attraction being the gardens at Ascog Hall which are accessed from the A844 coastal road to the east.

The northern part of the site lies within land designated in the Argyll and Bute Local Plan as 'sensitive countryside' whilst the southern part lies within an area designated as 'rural opportunity area'. The implications of development on these areas and other relevant planning policies for land use and agriculture are addressed in Section 9.4.

9.3.2 Agriculture

The development site is located entirely within the land holding and ownership of Ascog Farm (farmhouse at NGR NS103631) which extends to 60 hectares of primarily grazing land. The southern part of the site crosses two fields of permanent pasture which are currently let to a neighbouring agricultural business and are occasionally used for grazing by cattle and sheep. The northern part of the site lies on scrubby grassland which is not currently under productive agricultural use.

The land capability for agriculture of the soils associated with the site is Class 5.1 which is defined as land suited only to improved grassland and rough grazings, the land being generally unsuited to more intensive cropping particularly given grazing and soil limitations indicated on the land classification maps. At Ascog the land affected by the development is permanent grazing comprising a mix of improved (southern part of site) and scrubby improved land (northern part of site). The site is not located in a Nitrate Vulnerable Zone (NVZ) or any other agri-environment designation, nor does it lie within a diffuse pollution priority catchment.

Overall, the sensitivity of the land use and agricultural uses of the baseline environment is assessed as being low. The land uses and baseline environment described in this Chapter are not predicted to change significantly between the date of this assessment (2012) and the anticipated opening year of the development (2015).

9.4 Predicted Impacts

9.4.1 Short Term Impacts

During site preparation and construction activities, access would need to be formed from the southern end of the site off the C class road between Ascog and Rothesay. An access track would then be formed from this point to the location of the three wind turbines to the north. The track used for construction purposes would then be retained as a permanent access to

the bases of each turbine and the proposed site control building (see Figure 1.3 in Appendix A).

Impacts on land use, recreation and agriculture during the construction stage are predicted to be low in all cases. Whilst areas of land would need to be formed for the turbine and site control building construction points, these would not affect the overall viability of the fields in which they are located, access for farm machinery or the husbandry and productivity of the enterprises. The significance of the environmental effects, taking account of baseline sensitivity is therefore assessed as minor (and therefore not significant). At the end of the wind energy project's design life, should it be decided to decommission the turbines, it is not predicted that significant effects would occur from this decommissioning process.

9.4.2 Long Term Impacts

Once commissioned, the wind energy project would occupy a relatively small area, and the permanent change in land use associated with the project comprises:

- An area of 0.054 ha for the three turbine bases (in total);
- An area of 0.004 ha for the site control building; and
- An area of 0.465 ha for the access track and the crane hardstanding areas.

Whilst the total area enclosed by the red line boundary (Appendix A) used to delineate the site for the planning application is 0.68 ha, the total area which would be permanently developed for the wind energy project would be 0.523 ha. This represents 0.9% of the farm's land holding.

This change in land use is predicted to have very limited impact on the recreational and agricultural uses of the site and Ascog Farm. The permanent effects of the development on land use, recreation and agriculture are predicted to be minor and not significant.

The residential and commercial properties identified within 500 m of the site boundaries are identified in Table 9.2.

Table 9.2: Properties within 500 m of Wind Energy Project

Distance from Site	Residential Property (and direction from site)	Commercial/Other Property (and direction from site)
0 to 100 m	None	None
100 m to 200 m	None	Sewage works (north)
200 m to 300 m	None	Reservoir/sluiice (west)
300 m to 400 m	Ascog Farmhouse (south east) Ascog Lodge (east)	
400 m to 500 m	Vineries (east) Braeside (west) Duneastein (west) High Bogany (north) Clairmont Cottage (east) Ascog House (south east) Balmory House (south east) Beech Park (south east)	
Total	10 properties	2 properties

N.B. Distances are based on the distance between the dwelling and the closest turbine

None of these properties lies within or adjacent to the development site therefore no significant land use effects are predicted for neighbouring property to the development. Other Chapters of this ES present the assessment of potential impacts on nearby properties (e.g. noise and shadow flicker).

No cumulative environmental effects on land use, recreation or agriculture are predicted from the proposals.

9.5 Mitigation Measures

The following mitigation measures would be implemented during the construction of the wind turbines and ancillary infrastructure to reduce the potential for negative environmental effects:

- Soils (topsoil and subsoil) which are excavated during construction for use in restoration would be handled and stored in accordance with relevant best practices to maintain the integrity and structure of the soil and prevent erosion by wind and water during earthworks and soil storage;
- The small clump of deciduous woodland close to the northernmost turbine location would be fenced and protected from any construction works;

-
- Field drainage which is interrupted during construction would be re-instated to maintain the integrity of the drainage system; and
 - Access for stock and agricultural vehicles would be maintained at all times during the construction works and construction working areas fenced off to prevent access by stock.

In addition, construction activities and their potential for risks to the environment would be controlled through the application of a Construction Environmental Management Plan (CEMP). This document will ensure best site practices are adopted on site and will include specific mitigation measures identified in this ES. An outline framework for the CEMP is detailed in Section 3.4.2 of this ES.

9.6 Significant Residual Effects

Taking account of the committed mitigation measures presented in Section 9.5, no significant residual effects on land use, recreation and agriculture are predicted during the construction, operation or decommissioning of the wind energy project.

9.7 Summary of Findings and Significant Effects

The proposed wind turbines would be located within the land holding of Ascog Farm on a site occupied by the Hill of Ascog. The proposed site extends across two fields currently used for occasional cattle grazing and an area of scrubby grassland to the north of these fields. The construction activities, permanent change in land use associated with the wind energy project and its operation are not predicted to have significant environmental effects on land use, recreation or agriculture.

10 GEOLOGY, SOILS AND HYDROLOGY

10.1 Introduction

This Chapter presents an assessment of the predicted impacts of the proposed wind energy project development on geology, soils and hydrology. It presents the impacts of the construction and operation of the development on the geology and soils and freshwater characteristics of the site, together with mitigation measures to minimise damage to soils and pollution to watercourses.

10.2 Approach

10.2.1 Scope and Consultation

The assessment and evaluation of impacts has been developed based on the overall project impact assessment methodology which is presented in Chapter 2 of this ES. The sensitivity of the baseline environment of the site has been defined taking account of a range of factors including designations, soils type and quality and hydrological conditions. On the basis of the baseline conditions described in Section 10.3, the site is considered to have a low sensitivity to change from the perspective of geology and soils and moderate sensitivity for hydrology.

The magnitude of impacts on geology, soils and hydrology has been assessed in this Chapter with respect to the following criteria.

Table 10.1: Magnitude of Impact

Magnitude of Impact	Description
High	<ul style="list-style-type: none"> Potential for long term and irreversible damage to geological features and/or soil quality Potential for acute pollution of water bodies from construction activities or substantial permanent change to hydrological features and patterns
Medium	<ul style="list-style-type: none"> Potential for limited but irreversible damage to geological features and/or soil quality Potential for pollution of water bodies from construction activities or permanent change to hydrological features and patterns
Low	<ul style="list-style-type: none"> Potential for limited damage to geological features and/or soil quality Potential for minor pollution of water bodies from construction

	activities or minor permanent change to hydrological features and patterns
Negligible	<ul style="list-style-type: none"> Negligible change to any of the above factors

The geology and soils criteria presented in Table 10.1 have been derived from SAC's experience and involvement in a range of previous EIA projects in the absence of definitive criteria or legislative standards. Hydrological criteria are proposed to avoid changes which could compromise the ability of water bodies to meet the required 2015 good ecological status category defined by the Water Framework Directive. Significant environmental effects have been evaluated where an impact of high magnitude has been predicted for impacts where the baseline environment has been characterised as being of low sensitivity and for impacts of medium or high where the baseline sensitivity is identified as moderate.

The following sources of information have been used in the assessment:

- Ordnance Survey Mapping, site visits and satellite photography;
- Soil Survey of Scotland (Sheet 6: South West Scotland & Handbook);
- British Geological Survey (BGS) mapping of solid and superficial geology at 1:50,000 scale (Sheet 29E and part 21E);
- A Geological Field Guide to the Island of Bute, Scotland (Geologists' Association Guide No. 51);
- BGS Groundwater Vulnerability Map of Scotland;
- BGS/SEPA Bedrock and Superficial Aquifers Productivity Maps of Scotland;
- BGS Hydrogeological Map of Scotland (Sheet 18 at 1:625,000 scale);
- BGS GeoIndex (web based mapping tool);
- SEPA Water Quality Classification Interactive Map (web based mapping tool);
- SEPA Indicative River and Coastal Flood Map;
- The Water Environment (Controlled Activities) (Scotland) Regulations Practical Guide (SEPA, 2011); and
- Discussions with the owner and manager of Ascog Farm.

The assessment has also drawn on the findings from consultation, in particular the EIA scoping response received from SEPA.

10.2.2 Regulations, Policy and Guidance Context

At the highest level water resources are afforded protection by the European Water Framework Directive which is implemented in Scotland through a series of primary and

secondary legislative instruments. The proposed development would not compromise the objectives of this legislation in terms of meeting good ecological status of all waterbodies by 2015.

The proposals for the wind energy project are not considered to have any adverse implications with respect to prevailing development plan policy. The relevant local plan policies are Policy LP ENV1 (Development Impact on the General Environment) and Policy LP ENV12 (Water Quality and Environment).

10.3 Baseline Conditions

The proposed development site for the wind energy project is located on the Hill of Ascog which forms part of the land holding at Ascog Farm. The geology, soils and hydrological character of the site and its environs is presented in this Section.

10.3.1 Geology Baseline

The solid geology of southern Bute is generally characterised by very old sedimentary deposits of the upper Devonian and Carboniferous geological periods. However the island also features a number of igneous intrusions and extrusions and the Hill of Ascog is formed from a volcanic extrusion (lava flow) of alkali basalt from the Clyde plateau volcanic formation. This area of igneous rock forms a wedge shaped area between two fault lines, one running just to the north of Hill of Ascog and one crossing the southern part of the site. The northern edge of this volcanic rock forms the steep northern side of the Hill of Ascog. The basaltic rock of the Hill of Ascog overlies several layers of Carboniferous mudstones and sandstones which in turn are underlain (at a depth of around 100m) by conglomerates from the Bute conglomerate formation.

The solid geology is overlain across some of the site by glacial till from the Quaternary period which is a sedimentary deposit comprising gravels and sands. The superficial deposits are not uniform in this part of Bute and in some areas there appears to be very little drift cover at all. The nearest BGS borehole record is close to the site (at NGR NS098630) and this confirms a relatively shallow superficial deposit of drift underlain by porphyritic lava.

The proposed development site has not been previously developed and currently is used for extensive agricultural purposes. There are no areas designated for their geological importance on or near the site.

10.3.2 Soils Baseline

The site lies within the Darleith/Kirktonmoor soil association, whose soils are broadly classed as drift deposits derived from basaltic rocks and the soil type is brown forest soil with some gleys. The soils are generally thin (rocky outcrops are common), freely draining and support extensive areas of grassland used for rough grazing. Immediately south of the proposed site boundary, as the gradient of the hillside slackens, the soils change to those of the Kippen/Largs association which are drifts derived from old red sandstone and comprise noncalcareous gleys with brown forest soils.

The soils of the site do not contain a significant organic component and no peat deposits have been identified within the area of the site to be developed.

10.3.3 Hydrology and Hydrogeology Baseline

There are no surface watercourses within the site. The nearest running water to the site is a small burn which flows from the northern end of Loch Ascog, via a sewage treatment works, to the coast near Montford. This burn is 100m from the northern edge of the development site at its nearest location. It is too small to be covered by SEPA's water quality classification scheme and has no particular protection in relation to cyprinids or salmonids.

The nearest standing water to the site is Loch Ascog which is located 230 m to the west of the site at its closest point. The Loch is a drinking water protected area and is also designated for its ornithological importance (see Chapter 6: Ornithology). A small un-named pond also lies approximately 300 m to the north east of the site. Key hydrological features are shown in Figure 1.3 in Appendix A.

The proposed wind energy project development site and its environs are not considered to be at risk from fluvial or coastal flooding. This area of Bute has an annual average rainfall of between 1,200 and 1,400 mm with the wettest months from October to January inclusive. Whilst the relatively high rainfall coupled with the sloping nature of the site (gradient in places up to 10%) has the potential to give rise to rapid surface water run-off, this is attenuated by the generally permeable topsoil and sub-soil of the site together with the permanent nature of the vegetation.

Superficial aquifers in this part of Bute are of low productivity and given the geological conditions underlying the site, it is not anticipated that shallow groundwater would be

encountered. The bedrock aquifers in southern Bute are generally highly productive and characterised by intergranular and fracture flow associated with the extensive sedimentary solid geology of the area (predominantly upper old red sandstone). The groundwaters underlying this part of Bute are monitored by SEPA and the classification status of the water is currently good. The groundwaters under all of Bute are designated by SEPA as a drinking water protected area. No specific pressures on the groundwater quality (e.g. through abstraction or pollution) have been identified and aquifers do not appear to be extensively exploited in this area (a fact supported by the proximity of Loch Ascog which is a drinking water reservoir).

The vulnerability of groundwaters under the site have been mapped by the BGS and are considered to be moderately vulnerable, taking account of the nature of superficial deposits and the proximity of the uppermost aquifer. Overall, whilst the character and depth of shallow soils and superficial deposits underlying the site reduce the ability to attenuate pollutant flow introduced from vertical pathways, the nature of the igneous rocks on which the Hill of Ascog is formed reduce the potential for significant groundwaters in the immediate vicinity of the site. The basaltic cap overlaying the groundwater bearing sedimentary deposits beneath the site presents an impervious layer which provides a significant level of protection to aquifers against pollution sources introduced above the site.

Groundwater does emerge from the fault line between the basaltic rock of the Hill of Ascog and the sedimentary rocks to the north and south in two places, west of the site by the C class road near Loch Ascog and south east of the site by the C class road near Beech Park. However, there are no wells, private water supplies or groundwater abstractions within 250 m of the site.

10.4 Predicted Impacts

10.4.1 Short Term Impacts

Geology and Soils

Construction works would require the excavation and either storage or removal of topsoils, subsoils and superficial geological deposits to various depths. Site access would be formed in the early stages of construction comprising a single new track from the C class road to the south of the site to the northernmost turbine location, a distance of approximately 900 m (see Section 3.3 for construction details). Since ground conditions are generally good, it is

not anticipated that the access track or works to develop foundations for hard standing areas and the site control building would require deep excavation. This would reduce the extent of soil excavation and storage and the potential for impact on underlying geology.

Turbine sites would require deeper excavations, typically to a depth of 1.6 m and a diameter of 16 m. Since soils and sub-soils on the northern part of the site are thin, it is likely that bedrock would be encountered when excavating the turbine bases, particularly for the central and northern turbine.

Excavated soils would either be re-used elsewhere on site during construction (e.g. to help form bunds or sustainable drainage systems) or stored in accordance with best site practices for subsequent use in progressive reinstatement of tracks, turbine bases and hardstanding areas.

The magnitude of impacts predicted to geology and soils during construction is low to moderate. Taking account of baseline sensitivity, no significant environmental effects on geology and soils are predicted during construction and decommissioning, provided best site construction practices are followed.

Hydrology and Hydrogeology

There would be no watercourse crossings associated with this project, nor any other works directly affecting surface watercourses. No abstractions of groundwater would be required during construction, operation or decommissioning. Water required to form concrete turbine bases or other cement based materials would be brought onto site by bowser or piped from the nearest field water supply point.

The main potential for construction impacts on hydrology and hydrogeology arises from:

- Spillage and subsequent run-off to controlled waters of liquid concrete, fuels, oils or other chemicals with high aquatic pollution potential;
- Run-off from construction areas of surface water contaminated with high levels of sediment or nutrients reaching surface or ground waterbodies; and
- Interruption to, and potential contamination of, groundwater as a result of construction excavations, works and dewatering.

The control of fuels, oils and chemicals on site would be managed through the development and application of a Construction Environmental Management Plan and site specific

mitigation measures (see Section 3.4.2 for outline of a typical CEMP). These controls would significantly reduce the risk of pollution events from the operation of plant and machinery on site and no significant environmental effects are predicted.

The access track and proposed turbine and site control building locations are sited a considerable distance from the nearest surface waterbodies. Nevertheless, in accordance with SEPA's General Binding Rules⁶⁵, construction works for the access track and main construction sites would include measures for sustainable drainage which would intercept and attenuate both drainage flows and potential sediments and contaminants. These measures would prevent surface water drainage from construction areas reaching either surface watercourses or (in the southern part of the site) more permeable soils and drifts which overlie aquifer bearing bedrocks. No significant effects on the quality of surface or ground waters are predicted from the construction or decommissioning of the wind energy project.

Excavation works for the three turbines are not predicted to encounter or affect groundwaters since they are sites over volcanic rock strata which does not hold extensive aquifers. At the southern end of the site the basaltic bedrock gives way to sedimentary deposits which do hold productive aquifers. However in this location the bedrock is overlain by drift deposits and the excavation work required to establish the access track in this area of the site would be shallow. Provided that good site environmental management is followed (see Section 10.5) no significant effects on groundwater flows or quality is predicted from construction and decommissioning.

10.4.2 Long Term Impacts

Geology and Soils

The site access formed during construction would be retained as a permanent vehicular access for maintenance and eventual decommissioning. Long term operation of the wind energy project development is not predicted to have any significant environmental effects on geology or soils of the site.

Hydrology and Hydrogeology

⁶⁵ GBRs have been introduced as part of the regulatory framework for pollution control under the Controlled Activities Regulations in Scotland.

The newly developed hardstanding areas around the turbines, the site control building and the access track would introduce small areas of land over which rainfall would drain more rapidly than for the baseline situation. This creates the potential for changes in hydrological character across the site. However the relatively small scale of the changes, the absence of sensitive aquatic receptors in the vicinity of the site and the natural attenuation of surface water from the vegetated ground surrounding the site (as well as from sustainable drainage measures implemented during construction), would act to limit the magnitude of the impacts predicted to low and significant hydrological or water quality effects are therefore not predicted.

The small scale of the permanent changes in land use across the site and the operational practices of the wind energy project are not predicted to result in significant effects on hydrogeological resources either in terms of groundwater recharge or source protection.

Cumulative

No cumulative environmental effects on geology, soils, hydrology and hydrogeology are predicted from the proposals.

10.5 Mitigation Measures

All construction works would be undertaken in accordance with best site practices for environmental management which will include adherence to all relevant SEPA Pollution Prevention Guidelines (PPGs) and with the outline site CEMP for this project which is detailed in Section 3.4.2 of this ES.

The following mitigation measures would be adopted to minimise the risk of impacts on geology and soils from site construction and decommissioning:

- All topsoils to be re-used on site for restoration following construction or decommissioning would be stored separately from subsoils and in accordance with best soils handling practices to maintain their integrity and prevent erosions from wind and water;
- Mobile plant, HGVs and other machinery would operate only within designated construction areas around each turbine site and would access the site using the new access track;

-
- Soils within construction areas which are not to be excavated or form new hardstanding areas would be protected from compaction and other damage through use of appropriate protective measures fencing and geotextile mats; and
 - During decommissioning and subsequent reinstatement maximum use would be made of materials and soils on site, with any excess materials to be removed from site and re-used or recycled in accordance with the waste hierarchy.

No specific mitigation is predicted to be required to prevent impacts to geology and soils during maintenance and long term operation of the wind energy project.

The following mitigation measures would be adopted to minimise the risk of site construction and operation works to the aquatic environment:

- Surface water run-off from the main construction areas would be passed through Sustainable Drainage Systems (SuDS) such as infiltration basins and swales (in accordance with General Binding Rules) to prevent pollution to surface watercourses;
- In order to prevent pollution during construction a pollution incidence response plan in accordance with the requirements of SEPA PPG 21 would be prepared and adhered to by all site operatives;
- Dewatering of excavations for the three turbine foundations would be minimised through undertaking of civil engineering works outwith particularly wet periods;
- Construction of the access road and hard standing areas would not be carried out during periods of heavy rain;
- No fuel or oil would be stored permanently on site and any refuelling would be carried out at a designated area at least 10 m away from any drain;
- Temporary toilet facilities located on site will be maintained by a SEPA approved contractor;
- Measures would be put in place to prevent a build up of silt on the road surface of the adjacent tarred road from vehicle movements to and from the site during construction;
- The access road and hard standing areas would be constructed with small earth bunds at either side, a cut-off ditch on the upslope side and a swale on the down slope side;
- The grass lined swales would discharge to either small grass lined infiltration basins or sub surface soakaways at regular intervals along the line of the access road;

-
- Cable trenches would be excavated during drier periods of weather with the spoil from the excavations placed on the upslope to prevent surface run-off entering the excavations;
 - Cable connections would be laid and backfilled as quickly as possible after trench excavation to limit water ingress into the trench;
 - All disturbed earth works would be sown with grass seed as soon after construction start as possible to stabilise the soil surface and prevent erosion;
 - Soil stripped during earthworks would be carefully stored and used for creating track verges, earth bunds, swales and infiltration basins;
 - Where an existing drain is disturbed during construction it would either be diverted round the development or replaced with a sealed drain where it has to pass through the development;
 - The foundation for the turbines would be constructed of high grade concrete which does not leach into the surrounding strata; and
 - During the operation phase small quantities of oil and grease would be required on site to maintain and repair the turbines, these would be stored according to best practice until required.

It is proposed that SuDS drainage systems installed during the construction phase would be maintained and remain operational for the life of the development.

10.6 Significant Residual Effects

Taking account of the committed mitigation measures presented in Section 10.5, no significant residual effects on geology, soils, hydrology or hydrogeology are predicted during the construction, operation or decommissioning of the wind energy project.

10.7 Summary of Findings and Significant Effects

The proposed wind energy project development site is located on the Hill of Ascog which comprises a flow of igneous rocks overlying sandstones and mudstones. The soils on the site are generally free draining brown forest soils and in places these are underlain by drift deposits of glacial till. There are no surface watercourses within the site, the nearest feature being a small burn 100m to the north which forms the outflow from Loch Ascog, a drinking water supply loch. Whilst there are productive aquifers beneath the site, these are overlain by the generally impermeable basaltic rocks which characterise the Hill of Ascog.

No significant impacts on geology and soils are predicted during construction, operation or decommissioning provided best site construction practices are followed. There would be no direct impacts from the wind energy project development on water resources. No significant indirect effects on water quality of surface or ground waters are predicted provided that sustainable drainage measures are installed during construction to limit run-off of surface waters and the mitigation measures outlined in this Chapter are adopted to prevent spillage of potentially polluting materials during construction, operation and decommissioning.

11 NOISE ASSESSMENT

11.1 Introduction

Noise from wind turbines consists of the sound produced by the turning blades and from the gearbox, generator and hydraulic systems within the nacelle. The most important factors affecting noise are:

- Type of noise source;
- Distance from source;
- Wind speed; and
- The presence of barriers and buildings.

The factors with the most influence on noise propagation are the distance the observer is from the source and the type of noise source. This Chapter considers the noise propagation from the proposed wind turbine development during operation.

11.2 Approach

11.2.1 Scope and Consultation

The scope of this assessment follows ETSU R97 which is regarded as relevant guidance on noise from wind turbines. ETSU (1997) suggests that current practice on controlling wind farm noise should be by the application of noise limits at the nearest noise-sensitive properties. These noise limits should be applied to external locations and should apply only to those areas frequently used for relaxation or activities for which a quiet environment is highly desirable. The report suggests that noise limits should be set at an $L_{A90,10min}$ of no more than 5 dB(A) above background noise levels up to wind speeds at 10 m height (V_{10}) of 12 m/s, subject to a minimum of 35 to 40 dB(A) for daytime and 43dB(A) for night-time. However, the report also states both day and night-time lower fixed limits can be increased to 45dB(A) to increase the permissible margin above background where the occupier of the property has some financial interest in the wind farm development.

Construction noise is not considered within this Chapter. Construction noise is transient in nature and therefore can be controlled by following standard industry practices, applying best practicable means and using modern, well maintained and serviced items of plant. Normal hours of operation for construction purposes would be between 08:00 and 18:00

Monday to Friday and between 08:00 and 13:00 Saturday in order to prevent disturbance to local residents.

In order to provide a basis for comparison, a list of typical noise levels as listed in PAN 1/2011 has been provided in Table 11.1 below.

Table 11.1: Typical Noise Levels

Source/Activity	Indicative Noise Level (dB(A))
Unsilenced pneumatic Drill (at 7m distance)	95
Heavy Diesel Lorry (40km/h at 7m distance)	83
Modern twin-engine jet (at take off at 152m distance)	81
Passenger car (60 km/h at 7m distance)	70
Office Environment	60
Ordinary conversation	50
Quiet Bedroom	35

11.2.2 Regulations, Policy and Guidance Context

The proposed wind energy project at Ascog Farm would have no significant effects in relation to operational noise and therefore are not considered to have any adverse implications with respect to prevailing development policy. The relevant local plan policy is Policy LP REN 1 (Wind Farms and Wind Turbines).

PAN 1/2011 Planning and Noise provides national planning advice for the development of renewable energy technologies, including on-shore wind energy. Recommendations are given on all aspects of wind turbine development covered in this Environmental Statement, including the assessment of noise from wind farms. This planning advice note suggests that the report “*The Assessment and Rating of Noise from Wind Farms*” (ETSU, 1997) presents a series of recommendations that can be regarded as relevant guidance on good practice.

11.2.3 Assessment Methodology

The noise impact of the proposed wind turbines at Ascog Farm has been assessed by means of a desk study based on a background noise survey at the closest sensitive receptors. Turbine immission levels at the identified locations have been calculated using octave band sound power data as supplied by the turbine manufacturer, taking account of any tonal penalties.

For the purposes of this noise assessment, noise emission data was obtained for the turbine model under consideration, Enercon model E-48 at 50 m hub height. The Octave Band data has been sourced from DAR (Deutscher Akkreditierungs Rat) as measured by Wind-Consult GmbH; this represents the fullest account of the Octave Band analysis of the proposed Enercon E-48 turbine model. Table 11.2 shows the turbines noise output in octave bands.

Table 11.2: DAR E-48 Octave Band Sound Power Data dB(A)

Freq (Hz)	Wind Speed (m/s)					
	5	6	7	8	9	10
63	74.6	78.2	80.8	79.2	79.5	78.6
125	80.3	82.3	85.5	85.6	87.0	84.4
250	87.3	89.2	93.0	94.7	95.8	93.3
500	88.0	91.5	94.9	96.7	97.2	96.8
1000	85.6	91.3	93.3	95.1	94.8	97.9
2000	81.8	86.1	88.2	88.7	89.7	92.7
4000	78.0	82.3	85.3	85.4	88.5	87.6
8000	74.3	78.9	82.8	83.2	86.8	84.6

As the stated sound power levels derive from noise measurements carried out downwind from the turbine (in accordance with EN 61400-11:2003), these levels represent the worst case in terms of wind direction.

The use of this data is recommended to utilise a 2 dB uncertainty value, this value shall be added to each octave band value noted in Table 11.2 during the calculation of turbine noise.

The above Octave band data shall be assessed using the methodology given in ISO 9613-2 General Method. This method allows for accurate attenuation levels to be calculated for each octave band before calculating a final figure. For this turbine model the General Method provides a more conservative approach to calculating expected noise levels at sensitive receptors. The general information used in the calculation of noise at each property is contained in Table 2 and Table 3 of ISO 9613-2.

11.2.3.1 Atmospheric Absorption

Atmospheric absorption has been calculated as per the standard figures available in ISO 9613-2. Attenuation coefficients corresponding to 10°C and 70% humidity have been used to give relatively low levels of attenuation for a more conservative approach

11.2.3.2 Ground Absorption

As the site is mostly farmland from the turbine to the sensitive receptors it may be reasonable to assume that the ground is acoustically porous, however following advice from the Institute of Acoustics (I.O.A) it will be considered mixed ground with a porosity of 50% or a ground factor of 0.5.

The Octave band general method uses the ground attenuation calculation found in 7.3.1 of ISO 9613-2. This assumes a ground factor of 0.5 for a more conservative calculation of turbine noise at sensitive receptors.

11.2.3.3 Receiver Height

The receiver height used for this assessment has been set at 4 metres. This height has been suggested by the Institute of Acoustics to provide the most accurate representation of calculated noise immission levels from wind turbines when assessed using ISO 9613-2 General Method.

11.3 Baseline Conditions

11.3.1 Site Description

The location of the turbine site, the closest sensitive receptors, and locations of the noise meter and the anemometer used for assessing background noise are detailed in Figure 11.1, Appendix H .

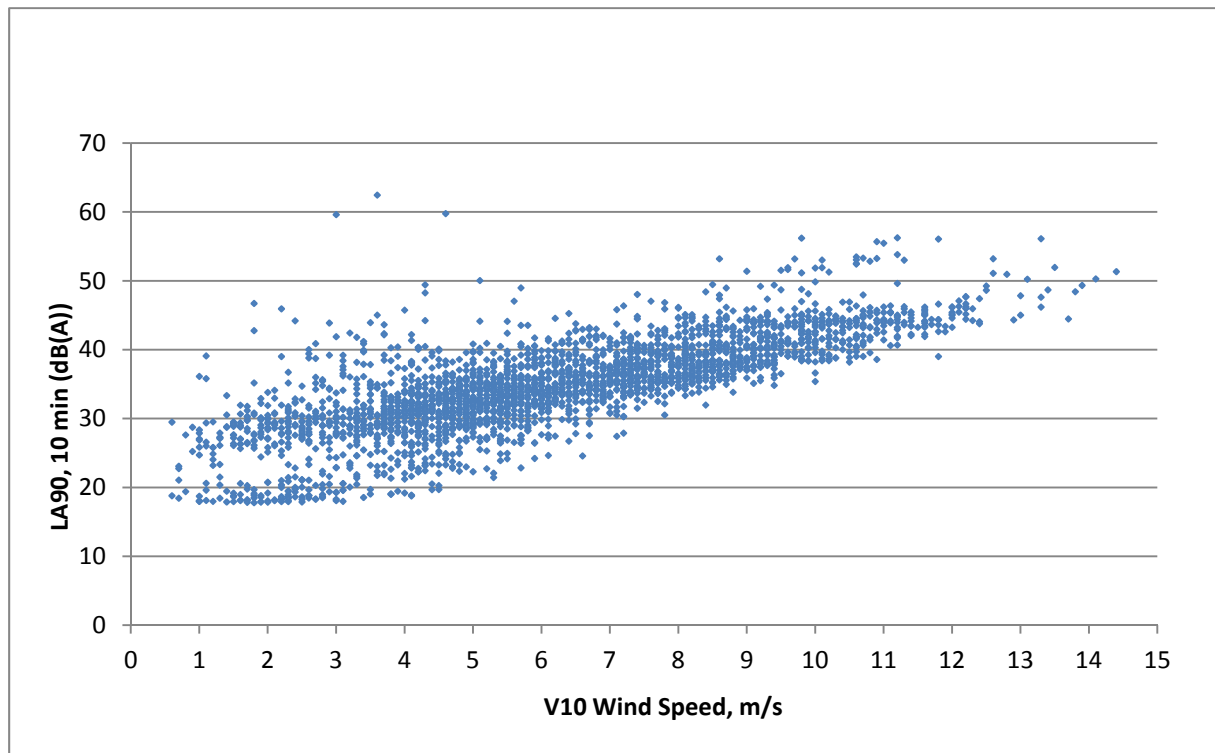
11.3.2 Background Noise

In order to assess the impact from noise generated from the turbine it is necessary to consider background noise levels. In a rural area, background night-time levels are typically between 20 and 40 dB(A). A noise and wind speed survey was carried out over three weeks (April/May 2011) at Ascog Farm to establish background noise levels. The equipment used

included a Type 1 noise meter (B&K 2250) with outdoor microphone kit at height 1.3 m, a cup anemometer and wind vane mounted at 10 m height, and a tipping bucket rain gauge, all with data logging facilities. The most recent calibration certificates for the noise monitoring equipment were dated November 2010, and the anemometer was tested following repair by the manufacturer in August 2010.

The monitoring location chosen for the background levels is considered to be representative of the area as a whole due to the similar characteristics of the monitoring location to the great majority of the properties in the local area. The chosen monitoring position is also considered to represent the quietest instance of background noise levels at each property in the environs of the Ascog Farm turbine development.

Noise, wind speed and rainfall data were collected simultaneously at 10 minute logging intervals over the period 21st April – 12th May 2011. In accordance with ETSU (1997) the LA₉₀ measure was used for background noise levels. As rain falling on and around the microphone housing creates noise, all 10 minute records when rain was falling were removed again in accordance with the ETSU guidance. After deleting those intervals the remaining data includes wind speeds covering 0.5 to 14.5 m/s, as illustrated in Figure 11.2 below.

Figure 11.2: Wind Speed Records at 10 m Height

For the purpose of the noise impact assessment the day is broken into three constituent time periods of which the night time and quiet day times are of interest. ETSU (1997) defines quiet daytime as 18.00 h to 23.00 h every day, plus 14.00 h to 18.00 h on Saturdays and 07.00 h to 18.00 h on Sundays. Night-time is defined as 23.00 h to 07.00 h every day. The gathered data was filtered for each of these periods and times where rainfall was measured were removed. After filtering the available data for assessment amounted to:

- Quiet day periods: 854 periods
- Night periods: 951 periods

The wind speed related background noise recorded for these periods is summarised in Figures 11.3 and 11.4 below.

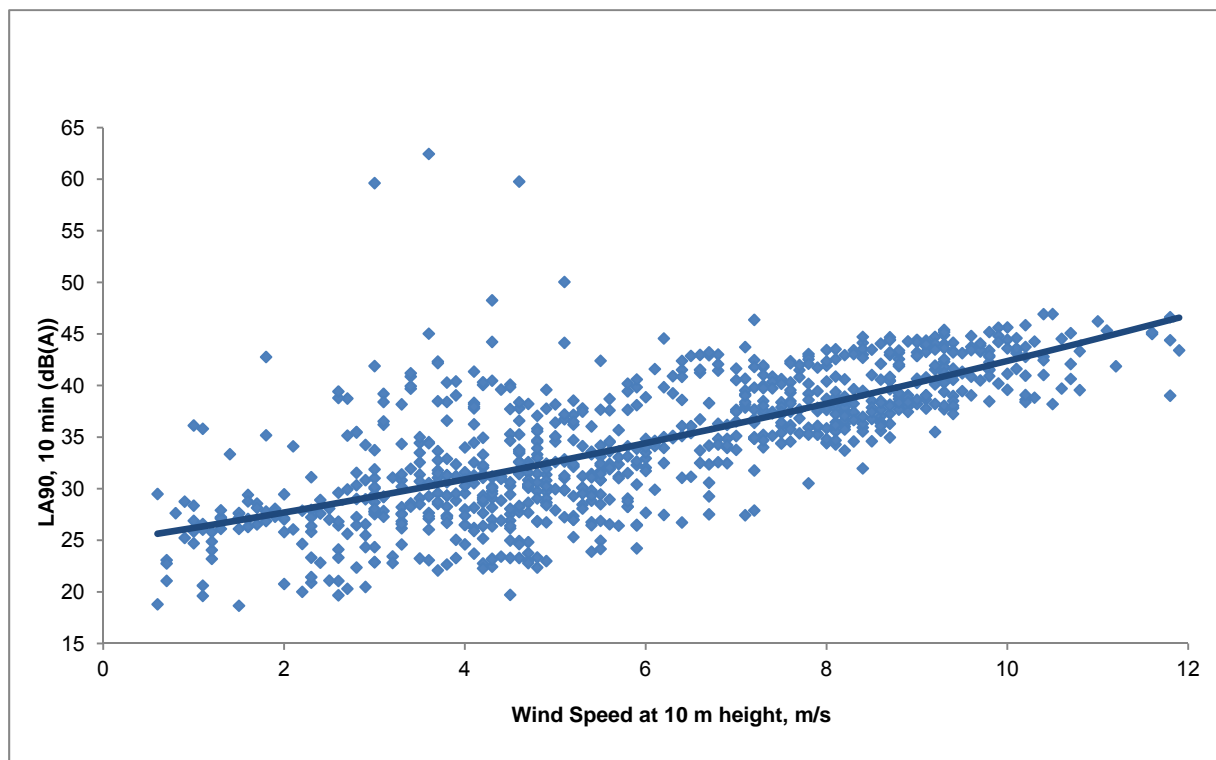
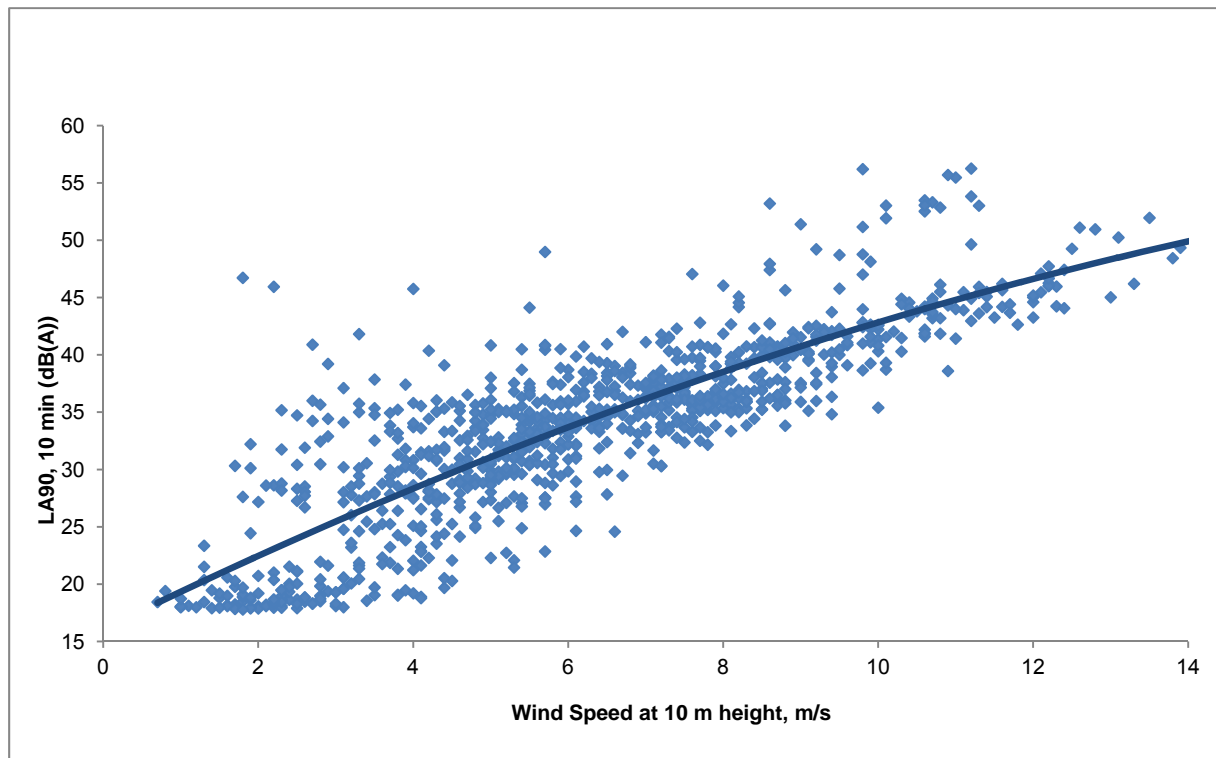
Figure 11.3: Background Noise (dB(A)), Quiet Daytime

Figure 11.4: Background Noise (dB(A)), Night

11.4 Predicted Impacts

Many of the properties close to the Ascog Wind Energy Project are predicted to receive noise immission levels greater than the 35 dB(A) limit level as suggested by the ETSU 1997 guidelines. While assessment of each could be made for the purposes of providing a general picture of the expected impacts and the predicted conformance to guideline levels a selection of the four closest receptors has been made in order to show the predicted impact on all properties within the immediate vicinity of the proposed development.

Four residential properties have been identified that are most likely to be affected by turbine noise. Calculated distances between the proposed turbine locations and the four receptors are shown in Table 11.3. These include lateral distances between turbine towers and the houses, plus vertical components due to the 50 m hub height and any differences in base elevation.

Table 11.3: Turbine Hub to Receptor Distances (m)

Turbine	Ascog Farmhouse, elev. 50 m	Ascog Lodge, elev. 38 m	Braeside, elev. 58 m	Vineries, elev. 67 m
T1, base elev. 94 m	575.2	568.3	439.8	419.4
T2, base elev. 90 m	423.0	445.6	500.4	442.1
T3, base elev. 76 m	311.0	388.9	591.8	547.1

There are no intervening structures that may attenuate noise arriving at the receptors. The house at Vineries is screened by trees that will provide some noise attenuation during summer months, less so in winter when the trees are bare, however attenuation by trees has not been considered in calculating noise from the development at any receptor. The intervening ground is mostly un-paved (agricultural fields) and acoustically 'soft'. As calculations based on turbine sound power level give equivalent continuous noise, turbine noise at the receptor has been adjusted by -2 dB to correct to L_{A90} levels as suggested in ETSU (1997).

11.4.1 Octave Band Calculations

The results of the Octave band analysis using the DAR data give the calculated turbine noise levels at each receptor and are shown in Tables 11.4 and 11.5 below. Again an uncertainty has been added to each value, in this case 2 dB and 2 dB has been subtracted as recommended in ETSU to give L_{A90} values for the cumulative noise from all turbines at each receptor. Table 11.4 shows the individual turbine noise levels expected at Ascog Farmhouse, these values are then logarithmically added to give a cumulative noise level from the whole development at each property as shown in Table 11.5 for both quiet day and night periods.

Table 11.4: Example of Individual Turbine Levels at Ascog Farm House showing Combined Calculated Level (dB(A)) for Quiet Day Time and Night Time Periods

Ascog Farm House	Wind Speed m/s					
	5	6	7	8	9	10
Turbine 1	25.5	29.3	32.3	33.9	34.3	34.9
Turbine 2	28.6	32.4	35.3	37.0	37.4	38.0
Turbine 3	31.5	35.4	38.7	39.9	40.4	41.1
Combined	34.0	37.9	40.8	42.4	42.8	43.5

Table 11.5: Combined Predicted Noise Levels at closest Receiver Properties (dB(A)) Quiet Day and Night Time

Receiver Property	Wind Speed m/s					
	5	6	7	8	9	10
Ascog Farm House	34.0	37.9	40.8	42.4	42.8	43.5
Ascog Lodge	32.7	36.6	39.5	41.1	41.5	42.2
Braeside	31.7	35.5	38.5	40.1	40.5	41.1
Vineries	32.5	36.4	39.3	40.9	41.3	41.9

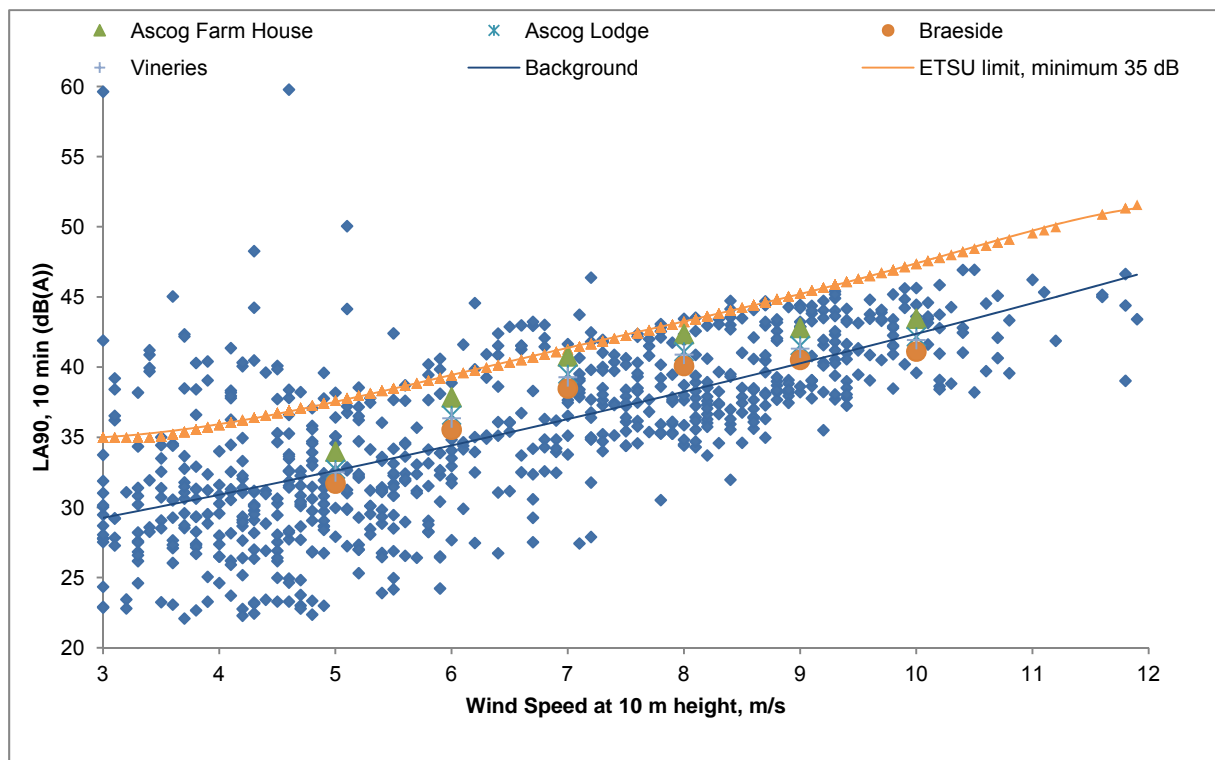
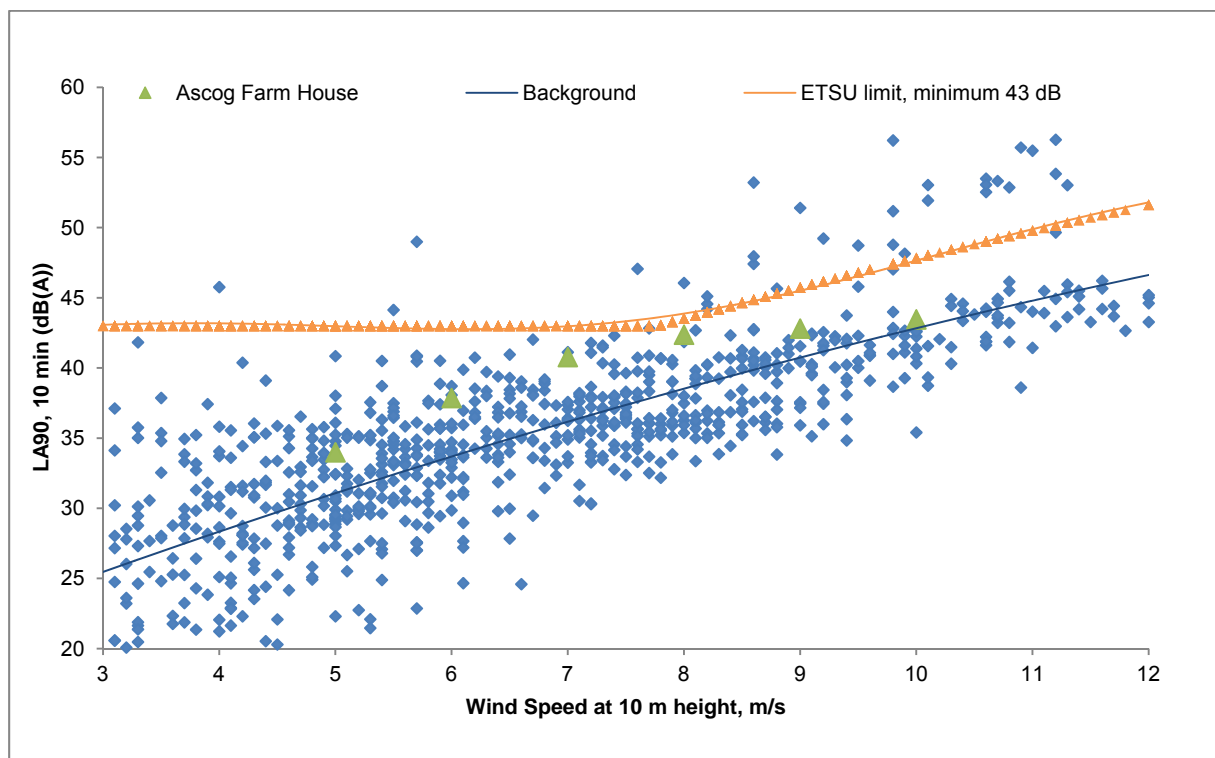
As can be seen from the data in the tables, all of the chosen properties exceed the guideline level of 35 dB(A) for day time levels while only one property; Ascog Farmhouse, exceeds the night time level of 43 dB(A). It is therefore necessary to show that these predicted noise immission levels will not exceed upper guideline levels of Background plus 5 dB.

11.4.2 Data Analysis/Results

The measured background noise data was increased by 5 dB(A) and a trend line was fitted to the data. The trend line values were amended to give the limit during the Quiet Day of 35 dB(A) and at Night 43 dB(A). The equations for the trend lines are given in Table 11.6 and relate to the L_{A90} data (blue line), the red orange limit line being 5 dB(A) higher. Figures 11.5 and 11.6 show the predicted turbine noise level at each sensitive receptor property in relation to the measured background levels using the General Method of ISO9613-2. The symbols represent the turbine noise immission at each property while the blue trend line represents the background noise level at relative wind speeds. The figures show wind speeds commencing at V_{10} wind speed 3 m/s, though no noise data is available for the turbine at V_{10} wind speeds below 5 m/s when power generation is minimal.

Table 11.6: Trend Line Equations for L_{A90} data

Quiet Day	Night
$y = 0.0384 x^2 + 1.3741 x + 24.789$	$y = -0.0649 x^2 + 3.3249 x + 16.073$

Figure 11.5: Calculated Noise Levels at all Properties Quiet Daytime**Figure 11.6: Calculated Noise Levels at Ascog Farm, Night**

11.4.3 Comparison of Background Levels to Predicted Turbine Noise

Tables 11.7 and 11.8 compare the predicted turbine noise at residences closest to the turbine with the background noise data. The difference between calculated turbine noise and background noise is expressed as a positive or negative value, where the value is negative then the turbine is that much quieter than background noise levels, where the value is positive the turbine is calculated to be that much above background levels.

Table 11.7: Quiet Day Turbine Noise Results (dB(A))

	Wind Speed m/s					
	5	6	7	8	9	10
Ascog Farm House Background	32.6	34.4	36.3	38.2	40.3	42.4
Turbine	34.0	37.9	40.8	42.4	42.8	43.5
Difference	1.4	3.4	4.5	4.1	2.5	1.1
Ascog Lodge Background	32.6	34.4	36.3	38.2	40.3	42.4
Turbine	32.7	36.6	39.5	41.1	41.5	42.2
Difference	0.1	2.2	3.2	2.9	1.3	-0.2
Braeside Background	32.6	34.4	36.3	38.2	40.3	42.4
Turbine	31.7	35.5	38.5	40.1	40.5	41.1
Difference	-0.9	1.1	2.2	1.8	0.3	-1.3
Vineries Background	32.6	34.4	36.3	38.2	40.3	42.4
Turbine	32.5	36.4	39.3	40.9	41.3	41.9
Difference	-0.1	1.9	3.0	2.7	1.1	-0.4

Table 11.8: Night Time Turbine Noise Results (dB(A))

	Wind Speed m/s					
	5	6	7	8	9	10
Ascog Farm House	31.1	33.7	36.2	38.5	40.7	42.8
Background						
Turbine	34.0	37.9	40.8	42.4	42.8	43.5
Difference	2.9	4.2	4.6	3.8	2.1	0.6
Ascog Lodge Background	31.1	33.7	36.2	38.5	40.7	42.8
Turbine	32.7	36.6	39.5	41.1	41.5	42.2
Difference	1.6	2.9	3.3	2.6	0.8	-0.7
Braeside Background	31.1	33.7	36.2	38.5	40.7	42.8
Turbine	31.7	35.5	38.5	40.1	40.5	41.1
Difference	0.6	1.9	2.3	1.6	-0.2	-1.7
Vineries Background	31.1	33.7	36.2	38.5	40.7	42.8
Turbine	32.5	36.4	39.3	40.9	41.3	41.9
Difference	1.4	2.7	3.1	2.4	0.6	-0.9

The assessments show that turbine noise from the Ascog Wind Energy Project Turbines will exceed background noise levels at all of the properties assessed. All receptors considered would be below the limit set in ETSU (1997) of background plus 5 dB(A) at all times. The sound power generated by these turbines reaches a plateau at around 10 m/s V_{10} , and once this wind speed is reached turbine noise falls below the background noise regression curves.

11.4.4 Rating Level

Utilizing the background noise data gathered rating levels can be calculated for the turbine development. The rating levels presented below in Table 11.9 are only a recommendation and are based on the background noise level plus 5 dB(A) to present the ETSU R97 derived limit value for each wind speed in relation to the background noise levels.

Table 11.9: ETSU R97 Derived limit values Quiet Day and Night periods

	Wind Speed m/s					
	5	6	7	8	9	10
ETSU R97 Derived Limit values	36.1	38.7	41.2	43.5	45.7	47.8

11.5 Mitigation Measures

No mitigation measures are proposed at present. Measurement of wind turbine noise after installation to ensure noise impacts are not intrusive may be justified in the case of a complaint.

11.6 Summary of Findings and Significant Effects

- A background noise survey has been carried out at the closest sensitive receptor site at Ascog Farm.
- Turbine noise levels anticipated at the four closest noise sensitive receptors, Ascog Farm, Ascog Lodge, Braeside and Vineries, have been calculated from noise data provided by the turbine manufacturer.
- Comparison with the assessed background noise suggests that receptor turbine noise levels will exceed background levels by at most 4.6 dB(A). Thus the requirement in ETSU (1997) not to exceed 5 dB(A) above background is satisfied. This assessment indicates that the acceptability criteria for turbine noise in ETSU (1997) are met at all receptors considered.
- As there are no other wind turbines in the area there are no cumulative turbine noise impacts at these receptors.

12 ACCESS AND TRANSPORT

12.1 Introduction and Scope

This Chapter presents an assessment of the predicted impacts of access and transport of the proposed wind energy project. It presents the impacts of the construction and operation of the development, together with mitigation measures to avoid or reduce significant effects.

12.2 Site Access

Due to the abnormal size and loading of wind turbine delivery vehicles, it is necessary to review the public roads that would provide access to the site to ensure that they are suitable, and to identify any modifications required to facilitate access for delivery vehicles. A preliminary access study undertaken by Green Cat Renewable Ltd was instructed by the Client. The turbine supplier would undertake a more detailed access study should the proposed wind energy project be granted consent.

The preliminary access study was carried out using a combination of map based assessment, visual inspection of potential pinch-points, and a computer simulation swept-path analysis of key pinch-points. Potential pinch-points identified through the map based assessment were then assessed on site. Swept-path analysis involves a computer simulation of a transporting vehicle which is super-imposed on an OS plan; the vehicle is then driven to simulate both the axle route and plan. The main considerations addressed with regards to access route and site access are as follows:

- The geometry of the delivery vehicles and their loadings;
- Suitability of roads to safely support the proposed loads;
- The requirements for Third Party land; and
- Foreseeable costs and disruption caused by road alterations to street furnishings and services.

The route for the delivery of construction materials and equipment to Ascog Farm would be via the A844, to the west of the site.

It is thought that the turbine delivery vehicles would travel via the ferry from Colintrave on the Scottish Mainland to Rhubodach on the Isle of Bute (approximately 11 miles by road north of Ascog Farm). The vehicles would then travel along the A844 and leaving the A844

at the junction with an unclassified road near Ascog, then turning right and heading northwest towards the site. A right turn onto the access track at NGR 209929662879 would complete delivery of the turbines to site. This is only an indication of a potential route and the applicant would ensure that the vehicles would be routed as agreed with Argyll and Bute Council Roads Department to minimise disruption and disturbance to local residents.

12.3 Site Transport

There would be three types of vehicular traffic during the construction of the proposed wind turbines:

- Exceptional loads;
- Conventional HGV movements delivering stone, steel reinforcing et cetera; and
- Vans and cars used by construction staff and deliveries.

The majority of the heavy goods vehicle (HGV) movements to the site would be by conventional lorries carrying construction materials although there would be a number of exceptional loads delivered to site as follows:

- Loads to deliver the turbine tower sections, blades and components; and
- Cranes.

12.3.1 Delivery of Turbines

The low loaders delivering the turbine components would have an overall length of between 27.5 and 34.5 m. A total of 18 abnormal load deliveries would be required for the three turbines (six loads per turbine). Two cranes are generally required to lift the turbine sections and blades into place on site; the largest crane proposed to be used on site is 17.4 m long and 3.2 m wide; the crane has 6 axles, all of which have axle loads of 12 tonnes, with the total vehicle weight of 72 tonnes. The cranes would have multi-wheel steering and the ability to negotiate tight bend radii where necessary. The speed of these vehicles is low and it is not anticipated that any highway strengthening would be required.

12.3.2 Delivery of Concrete

The concrete for the turbine foundations, approximately 435 m³, would be delivered from local batching plants in the ready-mixed form. Assuming a lorry load capacity of 8 m³, a total of 55 lorry loads would be required. For technical reasons it would be necessary to pour all the concrete in each base on the same day. Pouring is likely to take less than a working day

per turbine and would require a lorry load approximately every 30 minutes, therefore spreading the traffic out over the working day.

12.3.3 Stone Deliveries

The total road and hardstanding area required for the development will be 4,685 m². The volume of stone that will be required is estimated to be 1,874 m³ (4,685 m² x 0.4 m depth). Given that stone has a density of about 1.5 t/kg³, this would equate to 2,810 tonnes of stone. Assuming a lorry load capacity of 20 tonnes, the number of lorry loads required will be 141. It is noted that this work will be scheduled over three months (as detailed in Section 3.3.4 and therefore the lorry loads will be distributed over this period.

12.3.4 Steel Deliveries

For each wind turbine foundation there will be three lorry loads of steel reinforcing, ducting and foundation bolts.

12.3.5 Cable Deliveries

About 530 linear meters of underground cabling will be required at the site; cable comes in drums of up to 350 m. As a lorry can take several drums, only one lorry load will be required.

12.3.6 Other Traffic

There would a number of people working on site at any one time during the period of construction and there would be various deliveries in light vehicles. These vehicles would approach the site from various directions and would not create any noticeable impact during the construction period.

Following completion of the development, only site maintenance personnel vehicles would normally be required on the site. Weekly visits to the turbine by maintenance personnel in four wheel drive or conventional passenger vehicles would occur following the commissioning phase.

12.4 Predicted Impacts

12.4.1 Short Term Impacts – Site Access

Potential pinch points were identified from the desktop study and site visit. These pinch points may require remedial works to accommodate turbine delivery vehicles. The main problem is the length of the extendable vehicles required for the turbine blade deliveries, and those locations requiring confirmation of their load carrying capacity. The following key manoeuvres would need to be assessed prior to construction:

- Right turn at the junction off the A844 onto the unclassified road heading north west towards the site at NGR NS107620 (Pinch Point 1); and
- Traversing a sharp bend in the unclassified road at NGR NS106622 (Pinch Point 2).

Swept path analysis was undertaken (using AutoTrack 7) for these potential pinch-points. The swept path analysis for Pinch Point 1 using a 24 m trailer indicates that the turn is navigable with the tractor and trailer wheels riding onto the verge to a very small degree and therefore verge reinforcement or Third Party land usage is not required.

The swept path analysis for Pinch Point 2 using a 24 m trailer indicated that the turn is not navigable without the tractor and trailer wheels riding onto the verge. Two distinct routes were analysed to show the two possible areas either side of the road which could require reinforcement and/or clearance of trees and vegetation.

It should be noted that these are conservative estimates, and that the haulage company responsible for delivery of the turbines would also perform an assessment of the route, followed by a 'dry run' of the route where required.

12.4.2 Short Term Impacts – Construction Traffic

In the Section above, the different materials that will be required on site have been detailed. Table 12.1 summarises the predicted number of lorry loads required to transport the turbine components and construction materials to the site. It also predicted that approximately six to 10 cars/vans will be on site per day to enable personnel access to site. It can be difficult to ascertain the maximum number of vehicles per day during the construction period as different activities may be scheduled concurrently while most activities must happen in sequence. Typically HGV movements are at their highest when concrete foundations are being poured as there is a requirement for a continuous pouring operation.

Table 12.1: Transport To and From the Site

Material/Component	Number of Loads	Number of Trips
Turbines	18	36
Cranes	2	4
Stone	141	282
Cabling	1	2
Steel	9	18
Concrete	55	110
Total	226	452

It is not thought that the levels of traffic generated during the construction and operation period will be sufficient to have a significant impact on air quality. Potential impacts on air quality from dust and traffic during construction and decommissioning will be addressed through standard mitigation techniques to be agreed as part of a Construction Environmental Management Plan. No further specific assessment is proposed. No adverse air quality impacts are anticipated from the operation of the windfarm.

The effects of delay to other road users would mainly be apparent during the movement of abnormal loads as a result of their large size and low speed rather than their numbers. Changes in the volume, composition or speed of traffic would be apparent during the busier periods of construction i.e. concrete pouring,

The movements of high-sided vehicles could be considered visually intrusive to other road users, pedestrians and home owner and businesses along the route however this effect would be short-term and only occur during the construction period.

12.4.3 Long Term Impacts

During site preparation and construction activities, access would need to be formed from the southern end of the site off the C class road between Ascog and Rothesay. An access track would then be formed from this point to the location of the three wind turbines to the north. The track used for construction purposes would then be retained as a permanent access to the bases of each turbine and the proposed site control building.

Once erected, the wind turbines would be operated and monitored remotely. About two maintenance visits are required per month, with longer visits scheduled for servicing every three months. These visits would be undertaken in light commercial vehicles.

12.5 Mitigation Measures

It is assumed as a worst case, works to reinforce a short extent of verge will be required at Pinch Point 2; this will be discussed and agreed with Argyll and Bute Council.

As noted, the construction programme of the wind energy project development will take place over nine months therefore construction traffic will be spread out over this period. Normal hours of operation for construction purposes would be between 08:00 and 18:00 Monday to Friday and between 08:00 and 13:00 Saturday in order to prevent disturbance to local residents. The abnormal loads movements of the turbine components will be programmed to avoid peak periods of traffic; suitable times will be agreed with Strathclyde Police and Argyll and Bute Council in order to minimise delays to other road users.

Construction activities and their potential for risks to the environment would be controlled through the application of a Construction Environmental Management Plan (CEMP). This document would ensure best site practices are adopted on site and would include specific mitigation measures identified in this ES.

A Traffic Management Plan will be agreed with Argyll and Bute Council in order to manage the movement of construction traffic. It will also aim to minimise the effects of traffic travelling to and from the site during the construction period of the wind energy project.

12.6 Summary of Findings

This assessment concludes that the construction of the proposed development would result in a temporary increase in traffic levels on the proposed access routes. A suitable route for transporting abnormal loads, such as turbine components, was identified. Abnormal loads would be scheduled to occur during off-peak periods, timing to be agreed with Argyll and Bute Council Transport Department in order to minimise delays to other road users. Works may be undertaken to reinforce a short extent of verge at Pinch Point 2; this will be discussed and agreed with Argyll and Bute Council.

13 SOCIOECONOMIC AND COMMUNITY ISSUES

13.1 Introduction

This Chapter presents an assessment of the predicted impacts of the proposed Ascog Wind Energy Project on the local and wider economy with regards to financial benefits, impacts on tourism, property prices and other impacts to the wider community. It presents the impacts of the construction and operation of the development together with mitigation measures to minimise impacts to the socioeconomics of the area. It should be noted that the major submission on Socio-Economic and Community Issues is contained within the Planning Statement which accompanies the application.

13.2 Approach

13.2.1 Scope and Consultation

An assessment of the nature of the local economy and existing land use in the vicinity of the site was undertaken to establish the existing social and economic conditions of the area. The assessment was undertaken by means of a desk-based study. An assessment of existing recreation provision and use was carried out to establish what forms of recreational activity take place in the vicinity of the wind energy project. This was also by means of a desk-based study.

13.3 Baseline Conditions

13.3.1 Ascog Farm Overview

Ascog Farm, near Rothesay on the Isle of Bute, covers approximately 150 acres and has been locally owned by Mr Tear and Ms McVey for four years. The Farm fulfils a key role in the economic activity of the area continuing the trend of family farming on the island where Ms McVey's family have been farming for three generations, since the early part of last century. The family farm has recently relocated to Ascog from Lochend Farm at the southern end of Loch Ascog, where the family held the tenancy of that particular farm since 1955. Ascog farm is one of the few farms not owned by the Mount Stuart Trust.

Family farming has been the mainstay of the rural community on the island for many years but is now in decline. Membership figures from The National Farmers Union (NFU) show that smaller scale family farming has declined by a third in the last twenty years.

Diversification into a sustainable and reliable source of income is crucial for Ascog Farm to reduce their exposure to risk and to allow them to maintain and develop the farm's resources as responsible custodians of the land.

13.3.2 Population Data

An overview of the demographics of the surrounding area is detailed in Table 13.1.

Table 13.1: Population Figures (2001 Census)⁶⁶

Area	Total Resident Population
Postcode Area 60QD000561 ⁶⁷	173
Rothesay	5,017
Argyll and Bute Council Area	91,306
Scotland	5,062,011

13.3.3 Economic Activity

The workforce in Argyll and Bute according to the 2001 Census was 40,618. A summary of the 2001 Census employment statistics by area is provided in Table 13.2.

⁶⁶ 2001 Census data. <http://www.scot.nhs.uk>

⁶⁷ This is a geographic area consisting of the following postcodes: PA20 9EU, PA20 9LH, PA20 9LJ, PA20 9LL, PA20 9LN, PA20 9LP, PA20 9LR, PA20 9LW, PA20 9LZ, PA20 9NA, PA20 9NX, PA20 9PA, PA20 9PB, PA20 9PD.

Table 13.2: Employment Data (2001 Census)⁶⁶

Sector	Postcode Area 60QD000561⁶⁸	Rothsay	Argyll and Bute Council Area
All persons aged 16-74	121	3551	66506
Agriculture and hunting and forestry	11.11%	2.03%	4.59%
Fishing	0.00%	0.66%	1.82%
Mining and quarrying	0.00%	0.49%	0.71%
Manufacturing	8.64%	10.37%	7.05%
Electricity and gas and water supply	1.23%	0.77%	0.89%
Construction	1.23%	8.83%	7.36%
Wholesale & retail trade and repairs	7.41%	12.78%	11.81%
Hotels and restaurants	7.41%	9.65%	8.19%
Transport and storage and communication	3.70%	9.16%	7.10%
Financial intermediaries	2.47%	1.48%	2.01%
Real estate and renting and business activities	17.28%	10.59%	8.70%
Public administration and defence and social security	2.47%	6.25%	16.75%
Education	6.17%	5.92%	6.33%
Health and social work	16.05%	14.48%	11.99%
Other	14.81%	6.53%	4.70%

The main employment in the immediate area surrounding the proposed wind energy project is within the agricultural, manufacturing, health and social work, real estate and other sectors (circa 59.25%). A low level of employment relates to tourism within the area (circa 7.41%).

⁶⁸ This is a geographic area consisting of the following postcodes: PA20 9EU, PA20 9LH, PA20 9LJ, PA20 9LL, PA20 9LN, PA20 9LP, PA20 9LR, PA20 9LW, PA20 9LZ, PA20 9NA, PA20 9NX, PA20 9PA, PA20 9PB, PA20 9PD.

13.4 Predicted Impacts

13.4.1 Direct Economic Benefits from Construction/Operation of the Development

During the construction of the Development, money would typically be spent in the locality of the project. It is anticipated that local companies will bid for elements of the construction contracts. Additional indirect expenditure in local shops, service stations, hotels and restaurants is also expected. Local contractors will be used wherever possible.

Once operational, there would also be a requirement for maintenance engineers to undertake the supervision and maintenance and it is hoped that this will be provided by staff based on the Isle of Bute with specialist technical support as required.

With the combination of local authority rates, community benefit payments and other ongoing site maintenance expenses, this project would represent a substantial long term investment in the local area.

13.4.2 Direct Benefit for the Landowner

The revenue from farming can vary significantly from year to year due to variations in weather conditions, crop quality, market prices and operations costs such as fertiliser and fuel. Diversification into a sustainable and reliable source of income is crucial for Ascog Farm to reduce their exposure to risk and to allow them to cope better during poor farming years.

13.4.3 Direct Community Benefit

The potential of the site has been recognised by Community Energy Scotland and the Energy Saving Trust who together are administering the Scottish Government's Community and Renewable Energy Scheme. Ascog Farm received CARES funding and if the application for renewable wind energy generation is successful, the developers will give a minimum £10,000/installed MW/year for the lifespan of the project (20 years) to the applicants' local partner Fyne Futures, a registered Scottish Charity, to administer for the benefit of those living on Bute. This will be coordinated through its Towards Zero Carbon Bute (TZCB) project.

Isle of Bute Green Credentials

Towards Zero Carbon Bute (TZCB) is an entity that was set up in order to reduce Bute's carbon emissions. The project is organised through Fyne Futures (the sustainability subsidiary of Fyne Homes) with funding from the Scottish Government's Climate Challenge Fund. The aim is to help all Bute residents to reduce their CO₂ emissions, minimise electricity bills and reduce transport costs.

In 2007, the CO₂ emissions from Bute were 51,254 tonnes. The proposed Ascog Wind Energy Development will offset about 3,610 tonnes of CO₂ or about 7% of the island's total production. The number of CO₂ tonnes that came from domestic sources in 2007 was 20,645. The proposed project will not only directly reduce the carbon footprint of the island but also reduce it indirectly through insulation and other initiatives that will be offered to the community using proceeds from the wind turbines.

TZCB already have a number of ideas as to how best administer and utilise the fund that will be generated from the operation of the Ascog Wind Energy Project. This is based on research and consultation carried out by the TZCB project which shows that the island has a higher than average number of properties (88.5%) that are non-compliant with the Scottish Housing Quality Standard (SHQS). Therefore there is a high percentage of hard-to-heat, hard-to-treat, with low levels of insulation and double glazing. Research carried out by the Energy Saving Trust show that 62.5% of households on the island are stone built. Low levels of insulation combined with the harsh climate reduce the energy efficiency of the majority of the properties on the island which together with high fuel prices and low household income (14% of Bute residents were classed as income deprived in 2005)⁶⁹ creates higher than average rates of fuel poverty.

The community fund generated by Ascog Farm would be targeted at reducing domestic CO₂ emissions and tackling fuel poverty through a number of initiatives:

- Providing insulation solutions for stone built "hard to heat, hard to treat" properties
- Grants for cavity wall, solid wall and/or loft insulation
- Grants to install double glazing windows
- Funds to allow investigation of other renewable energy sources on Bute

The demand for improving home insulation will also stimulate local employment and create additional demand for new skills in the renewables energy sector.

⁶⁹ Scottish Neighbourhood Statistics Report

13.4.4 Indirect Economic Benefits on Wider Community

Farms are considered to be particularly good at recycling extra income into the local economy. Results from the Scottish Income-Output Tables⁷⁰ demonstrate that agriculture in general displays a high multiplier effect on the wider economy. An Agricultural Strategy for the Argyll Area⁷¹ (which covers the Isle of Bute) states that '*diversification gives rise to economic effects beyond the farm gate in the form of income and employment*'.

Given a reliable source of income to the farm, there are a number of exciting and diverse opportunities that can be capitalised on. These include:

- Reinstating the curling pond on farm as an attraction for tourists and local residents;
- Improving the landscape on the west side of the hill by planting indigenous broadleaved species;
- 'Cutting a Turbine Trail' celebrating the production of energy at Ascog throughout the ages;
- Developing the derelict cottage conveniently located near to, but at a safe distance from the turbine locations, into a visitor centre;
- Extending the pedigree herd of Shetland sheep to include other native rare breeds and improving the small herd of beef cattle;
- Continuing the improvement in field drainage; and
- Improving and renovating the original Georgian farm outbuildings.

These initiatives would be fully assessed at a later date and appropriate planning permission sought if required. The list above is not exhaustive and is solely aimed to provide an indication of the opportunities that would be possible with a new revenue stream. In addition as a result of these initiatives a number of new jobs could be created in the area.

13.4.5 Potential Adverse Impact on Wider Community

There are a number of potential impacts on the local community from the proposed wind energy project and these include:

- Landscape and visual amenity;
- Noise;

⁷⁰ 2007 Income-Output Tables. <http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Input-Output/IOAll98-07>

⁷¹ Argyll and Bute Agricultural Forum, 2005. An Agricultural Strategy for the Argyll Area

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- Shadow flicker; and
 - Telecommunications

Potential impacts of the above have been considered individually in their respective Chapters of this document and where appropriate mitigation measures suggested.

With respect to the impact on residential properties it should be noted that the Royal Institute of Chartered Surveyors (RICS) published a report in 2004 investigating the impact of wind farms on the value of residential property⁷². The report concluded that:

- Wind farm development reduces property values to some extent and that this impact starts at the planning application stage;
- Approximately 40% of RICS surveyors with experience of dealing with residential property transactions affected by wind farms reported that wind farms have no impact on residential property values; and
- Any negative impact of wind farms on property values appear to decline over time.

RICS published another survey in 2007 and this was undertaken by Oxford Brooks University⁷³ and this found less of a definite trend. In this study the sample consisted of a number of sites in Cornwall and found that house price fluctuations were more likely to be caused by factors other than wind farms despite initial evidence there was an effect.

The most recent international study into effects of wind turbines on property values was undertaken in the US by the Department of Energy's Lawrence Berkeley National Laboratory⁷⁴. The research collected data on almost 7,500 sales of single family homes situated within 10 miles of 24 existing wind facilities in nine different US states. The conclusions of the study are drawn from eight different hedonic pricing models, as well as both repeat sales and sales volume models. The various analyses are strongly consistent in that none of the models uncovers conclusive evidence of the existence of any widespread property value impacts that might be present in communities surrounding wind energy facilities. Specifically, neither the view of the wind development nor the distance of the home to those facilities is found to have any consistent, measurable, and statistically significant effect on home sales prices. Although the analysis cannot dismiss the possibility that individual homes or small numbers of homes have been or could be negatively impacted, it

⁷² RICS, 2004. *Impact of wind farms on the value of residential property and agricultural land*

⁷³ RICS, 2007. What is the impact of wind farms on house prices?

⁷⁴ Ernest Orlando Lawrence Berkeley National Laboratory, 2009. *The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis*

finds that if these impacts do exist, they are either too small and/or too infrequent to result in any widespread, statistically observable impact.

13.4.6 Impact on Tourism

The impact of wind farms on tourism is not clear cut. A number of surveys have been carried out with a variety of conclusions with as many surveys finding a positive effect as negative. Whilst, the development at Ascog Farm is not of the scale considered in the studies, the outcome of these surveys does suggest that there is strong support for onshore wind development in Scotland.

Recent local research on the island showed that the majority of local respondents interviewed were in favour of wind energy. In fact 92% were in favour of large scale wind turbines on Bute with 94% in favour of Bute becoming completely powered by renewable energy. This is made more pertinent given that the survey was published in December 2011 just before the storms of 3 January 2012 wiped out the entire electricity supply to the island for two days.

The biggest concerns reported in the same survey were climate change and rising energy costs. The benefits that the community would hope to gain from renewable energy projects included local employment, lowering the carbon footprint, reduced energy costs and energy efficiency improvements.

These benefits are addition to the commitment to the community fund geared towards tackling fuel poverty, creation of jobs and development of skills in a significant energy sector, continuation of traditional family farming, offsetting carbon footprint of the island, contributing to local and national targets on climate change. This requires the Ascog Wind Energy Project to be considered on its own merit in terms of how the local island economy and its community will benefit as a whole.

13.5 Mitigation Measures

The principal measure adopted by the wind energy project to reduce the effect on local and wider economy with regards, impacts on tourism, property prices and other impacts to the wider community has been the siting of the wind energy project. Where properties are affected, it is usually due to a poorly sited wind farm e.g. too close to a residential area. Well

sited wind energy developments do not appear to affect property values once they are constructed as the uncertainty regarding their visual impact is removed.

No specific additional measures which would adequately mitigate any indirect effects have been identified, although it should be noted that following early consultation with Historic Scotland the number of turbines was reduced from four to three.

13.6 Significant Residual Effects

Overall the economic impacts from this development are considered to be positive. The development represents a significant investment opportunity for the area which will impact indirectly on the demand for local services during the construction phases and provide ongoing community payments during the operational phase. It will also reduce the carbon footprint of the farm as well as the area as a whole, while securing their long term sustainability through additional investment. No adverse impacts are predicted on local recreation and tourist interests. The activities highlighted in the submission will serve to enhance local recreation and tourism opportunities.

13.7 Summary of Findings and Significant Effects

With regard to domestic properties, there is no robust evidence to suggest that the development will have a substantial negative impact on property values in the area and all effort has been made to maximise the distance from houses and therefore negate any adverse impacts on these properties from impacts such as noise and shadow flicker.

As detailed in Chapter 7, there would be limited significant landscape effects affecting the Ascog Wind Energy Project site area within approximately 800 m. Part of the Core Path (C252c) and Rothesay Golf Course at Canada Hill and part of the route of the West Island Way, as it passes Loch Ascog and crosses the B881, would also be significantly affected.

It is considered that the overriding socio-economic impacts are positive. The development represents a strong example of diversification for the landowner and it should provide a significant additional source of revenue. This income stream will not only support the ongoing farm business but will also have positive direct and indirect effects on other local business and the wider community.

14 OTHER TECHNICAL ISSUES

14.1 Introduction and Scope

This Chapter presents an assessment of the predicted impacts of the proposed wind energy project development on electromagnetic interference (civil aviation and radar, microwave and UHF links and television), shadow flicker, ice throw and road safety. It presents the impacts of the construction and operation of the development together with mitigation measures to minimise damage to soils and pollution to watercourses.

The following sources of information have been used in the assessment:

- Specific Advice Note: Onshore Wind Turbines (Scottish Government, 2012);
- Tall Structures and their Impact on Broadcast and Other Wireless Service (Ofcom, 2009); and
- CAP 764: CAA Policy and Guidelines on Wind Turbines (CAA, 2012).

The assessment has also drawn on the findings from consultation.

14.2 Aviation and Radar

14.2.1 Approach

The potential effects of wind turbines on aviation related interests are highly dependent on the broad area of the development and of the precise positions of individual turbines. In some cases there are no significant consequences and no mitigation is required, whilst in other cases the turbine specification or layout must be designed to accommodate infrastructure or activities. In the extreme, sites can be considered inappropriate for wind energy development.

The key sensitivities are generally physical obstruction if located close to an aerodrome or within a military training area, and the effects on radar systems operated by airports, NATS En-Route and the MoD. An assessment has been conducted to evaluate the potential for impacts across military and civil aviation interests, encompassing these aspects.

Consultation has taken place with relevant stakeholder bodies to accurately assess the potential impacts and resulting options on the proposal. The potential impact on aviation and radar has been assessed through desk based assessment and stakeholder consultation.

The following stakeholders were consulted:

- CAA;
- BAA; and
- Ministry of Defence.

14.2.2 Predicted Impacts

The vast majority of aviation impacts would be during the operational phase of the project. The impact on aviation and radar is a complex issue and therefore the impacts are assessed by the relevant statutory bodies. Due to the high volume of planning applications across Scotland, the majority of stakeholders would only provide a formal response once the planning application is submitted.

The CAA was consulted at the pre-planning stage; the CAA passed on the inquiry to BAA. In a letter dated 24 September 2010, the BAA stated that as the proposed development lies 38 km in a west south westerly direction from the Aerodrome Reference Point for Glasgow Airport, the turbines would not be visible to the radar. Therefore, BAA would have no safeguarding objection to the application going forward for planning approval.

The MOD was also consulted at the pre-planning stage. In a letter dated 29 October 2010, it was stated that the MOD would have no concerns with the proposal.

14.2.3 Mitigation Measures

The turbines would be fitted with aviation lighting in the interests of air safety.

14.2.4 Significant Residual Effects

No significant residual effects on civil aviation and radar are predicted during the construction, operation or decommissioning of the wind energy project.

14.3 Telecommunications

14.3.1 Approach

Wind turbines also have the ability to interfere with communication links using electromagnetic signals. Details of the proposed wind energy project were provided to Ofcom for consultation. Ofcom are the agency tasked with assessing the potential impacts of wind energy proposals on the civilian radio network. Ofcom responded with a list of those microwave links that were within a 350 m radius of the proposed site centre.

Information provided to Ofcom was also forwarded to Atkins and JRC (Joint Radio Company) who manage the scanning microwave and telemetry links of utility companies.

In order to ascertain the potential impact on local television signals, the BBC wind farm assessment tool was used⁷⁵.

14.3.2 Predicted Impacts

14.3.2.1 Microwave and UHF Links

Ofcom, JRC and Atkins were consulted at the pre-planning stage to ascertain if any microwave or UHF links would be adversely affected by the proposed development. The following responses were received:

- Ofcom stated in an email dated 14 July 2010 that BT and Orange microwave links may be affected by the proposed development;
- The coordinates of the BT link were provided in an email dated 14 July 2010 and it was stated that 'the proposed development would impact on our link ID6080, Ofcom Ref 0480952. Through a revision of the layout, BT responded stating they had no concerns.
- JRC stated in an email dated 2 March 2010 that they do not foresee any potential problems based on known interference scenarios; and
- Atkins stated in an email dated 5 July 2010 that they would have no objections to the proposed development.

⁷⁵ http://www.bbc.co.uk/reception/info/windfarm_tool.shtml

14.3.2.2 Television

The BBC's online tool predicted the proposed wind energy project '*...would be likely to affect 19 homes for which there is no alternative off-air service. In addition, you may affect up to 43 homes for which there may be an alternative off-air service.*' The transmitters likely to be effected are Rothesay, West Kilbride and Rosneath. The digitaluk website details that in STV Central, of which the Isle of Bute is within, the digital switchover was complete as of June 2011.

14.3.3 Mitigation Measures

As a result of the digital switch over, no potential impacts on television are anticipated and in the unlikely event of reception being affected, then solutions are available to remedy this and this arrangement would be agreed by condition.

No further impacts have been identified which require mitigation.

14.3.4 Significant Residual Effects

No significant residual effects on telecommunication links are predicted during the construction, operation or decommissioning of the wind energy project.

14.4 Ice Throw

14.4.1 Approach

Turbine blades have been designed to discourage any build up of ice as this causes the rotor of the turbine to go out of balance and the wind turbine to automatically shut down. This would only happen if the blades were stationary during a cold, still period allowing ice to accumulate without movement dislodging it.

14.4.2 Predicted Impacts

For the Ascog Wind Energy Project the build up of ice on the rotors during still periods is unlikely, even once per year.

Using a basic calculation suggested by Seifert *et al.*⁷⁶ an indicative distance for planning purposes can be made using the calculation

$$d = (D+H)*1.5$$

Where:

d = maximum throwing distance

D = rotor diameter in m

and *H* = hub height in m

Using this calculation, the resulting maximum distance that ice is likely to be thrown by the Ascog turbines (if at all) would be 147 m. There are no buildings or paths within 147 m of the wind energy project.

The nearest public access is the track approximately 200 m to the east of the wind energy project.

14.4.3 Mitigation Measures

No impacts have been identified which require mitigation.

14.4.4 Significant Residual Effects

No significant residual effects from ice throw are predicted during the construction, operation or decommissioning of the wind energy project.

14.5 Shadow Flicker

14.5.1 Approach

When the sun shines through the blades of a rotating turbine shadow flicker can occur. This is caused by the light being interrupted by the blades. Specific Advice Note: Onshore Wind Turbines discusses the likelihood of shadow flicker from wind turbines and suggests that properties outwith 10 rotor diameters should not be affected, therefore it is only known to be a problem in the following circumstances:

⁷⁶ Sietfert, H et al. 2003. Risk analysis of ice throw from wind turbines

- When somebody is inside a building with the sunlight shining through a window, i.e. it is not an issue outside;
- If the windows look towards the turbine and are not shielded by landform, other buildings or trees;
- When the sun is shining, so it is not a concern on cloudy days;
- When there is some wind – flicker would not occur when there is no wind;
- When the building is within 10 rotor diameters, or 480 m of the proposed turbine at Ascog Farm; and
- When the sun is behind the rotor. This may occur for about 30 to 45 minutes per day, but only if the turbine is between the house and the sun's solar track. Houses to the south of the turbine would not suffer shadow flicker.

14.5.2 Baseline Conditions

There are eight properties within 10 rotor diameters of the proposed turbines at Ascog as detailed in Table 14.1.

Table 14.1: Distance from Proposed Wind Energy Project (distances quoted are to the closest proposed wind turbine)

Residential Property	Approximate Distance and Direction from Site
Ascog Farm	307 m south east
Ascog Lodge	387 m east south east
Ascog House	413 m south east
High Bogany	414 m north
Vineries	414 m north east
Braeside	436 m west
Beech Park	467 m south south east
Clairmont Cottage	474 m east

14.5.3 Predicted Impacts

All eight properties were assessed using Windfarm Software Shadow Flicker Module which models the path of the sun and determines when, if any, shadow flicker is likely to occur. The assessment assumed that all properties had windows on the ground and a first storey that faced in the direction of the wind turbines. In addition this assessment does not take into consideration any screening effects of buildings or trees.

The findings are summarised in Table 14.2 below.

Table 14.2: Shadow Flicker Assessment for Properties within 480 m of the Proposed Turbines

House Name	Grid Reference	Max Hours/day	Total Hours/year
Ascog Farm	210327, 663049	0.68	29.6
Ascog Lodge	210442, 663147	0.59	29.5
Ascog House	210446, 663031	0.58	39.4
High Bogany	209989, 663950	0.53	37.1
Vineries	210457, 663564	0.55	38.1
Braeside	209603, 663565	0.56	17.9
Beech Park	210254, 662762	0	0
Clairmont Cottage	210535, 663420	0	0

Of the eight houses that are located within 10 rotor diameters and assessed, six residences may have a shadow flicker impact one of which is the applicant's own residence.

14.5.4 Mitigation Measures

Further modelling will be carried out post consent to establish exactly on what days and at what times in a year shadow flicker might occur and if required the turbines will be programmed to turn off during these times.

14.5.5 Significant Residual Effects

No significant residual effects from shadow flicker are predicted during the construction, operation or decommissioning of the wind energy project.

14.6 Road Safety

14.6.1 Approach

The main potential issue for road safety related to what is known as “driver distraction”. Concerns have been expressed in relation to a number of wind farm projects, that dangers to users of the public highway may arise either because wind turbines are a novel and interesting “attractor of attention”, or because the turbines may appear suddenly and unexpectedly to drivers.

Schreuder (1992)⁷⁷ carried out a study comparing two accident studies in order to establish a link between wind farms and accident numbers. Neither study finds an increase in road accidents in the vicinity of wind turbines. In fact, both studies indicated a slight decrease. However, this does not mean that wind turbines would not cause any distraction. The advice is that turbines are not located in places where the driver needs to pay great attention i.e. road junctions.

14.6.2 Predicted Impacts

The Ascog Wind Energy Project is located approximately 450 m from Roslin Road to the west at its closest point (Turbine 3) and approximately 550 m from the A844 to the east at its closest point. The views of the turbine along both roads are quite open for a couple of kilometres. A turbine that appears in view gradually reduces the risk of driver distraction. In addition, as wind turbines become more common in the landscape, drivers are less likely to be distracted by them. The visual impacts of the wind energy project are also discussed in Chapter 7.

14.6.3 Mitigation Measures

No further impacts have been identified which require mitigation.

14.6.4 Significant Residual Effects

No significant residual effects on road safety are predicted during the construction, operation or decommissioning of the wind energy project.

14.7 Summary of Findings and Significant Effects

14.7.1 Aviation and Radar

Consultation was undertaken with aviation and radar stakeholders and the potential for impacts has been examined in detail. All stakeholders consulted had no objections to the proposed development therefore no significant residual effects on civil aviation and radar are predicted during the construction, operation or decommissioning of the wind energy project.

⁷⁷ Schreuder D A. 1992 in Highways Agency. 2007. *Windfarm Good Practice Guide*

14.7.2 Telecommunications

There is no stated concern with this development and communication links in the area.

14.7.3 Ice Throw

The maximum distance that ice is likely to be thrown by the Ascog turbines (if at all) would be 147 m. There are no buildings or paths within 147 m of the proposed development.

14.7.4 Shadow Flicker

Some properties might be affected by shadow flicker, however the turbines can be programmed to shut down to avoid this being an issue.

14.7.5 Road Safety

The turbines are considered to be a suitable distance from all roads and routes to avoid any residual concerns regarding safety.

15 REFERENCES

References for Chapter 1

Household Electricity Consumption. Strathclyde University Study
http://www.sesg.strath.ac.uk/Reasure/Info_pack/RE_info/hec.htm

References for Chapter 5

Aas, G & Reidmiller, A. 1994. Trees of Britain and Europe. Collins.
JNCC. 2010. Handbook for Phase 1 Habitat Survey – a technique for Environmental Audit
Peterborough.

Bat Conservation Trust. 2007. Bat Surveys – Good Practice Guidelines.

Bat Conservation Trust, London.

Chanin P. 2003. Ecology of the European Otter. Conserving Natura 2000 Rivers Ecology
Series No.10 English Nature, Peterborough

Clark, M. 2007. Badgers. Whittet Books Ltd.

Cresswell, P., Harris, S. and Jefferies, D.J. 1990. The History, Distribution, Status and
Habitat Requirements of the Badger in Britain. Nature Conservancy Council, Peterborough.

Entwhistle, A.C., Harris, S., Hutson, A.M., Racey, P.A., Walsh, A. 2001. Habitat
management for bats: A guide for land managers, land owners and their advisors. JNCC:
http://jncc.defra.gov.uk/pdf/Habitat_Management_for_bats.pdf

Forestry Commission. 2009. Practical techniques for surveying and monitoring squirrels.
Practice Note FCPN011: [http://www.forestry.gov.uk/pdf/FCPN011.pdf/\\$FILE/FCPN011.pdf](http://www.forestry.gov.uk/pdf/FCPN011.pdf/$FILE/FCPN011.pdf)

Forestry Commission Scotland. 2009. Forest Operations and Otters in Scotland. FCS
Guidance Note 35c.

Gurnel J., Lurz P, McDonald P and Pepper, H. 2009 Practice Note – Practical Techniques for Survey and Monitoring Squirrels, Forestry Commission.

Harris, S., Cresswell, P. & Jefferies, D. 1989. Surveying for badgers. Occasional Publication of the Mammal Society No. 9. Mammal Society, Bristol:
<http://www.badger.org.uk/Content/Home.asp>

Hill, D, Fasham, M, Shaw, P, Shewry, M & Tucker, G. 2007. Handbook of Biodiversity Methods: Survey, Evaluation and Monitoring. RPS Group Plc & Scottish Natural Heritage.

IEEM. 2006. Guidelines for ecological impact assessment in the United Kingdom. Winchester. Institute of Ecology and Environmental Assessment.
<http://www.ieem.net/ecia/EcIA%20Approved%207%20July%2006.pdf>

JNCC 2004. Common Standards Monitoring Guidance for Mammals. ISSN 1743-8160.

Liles G. (2003) Otter Breeding Sites. Conservation and Management. Conserving Natura 2000 Rivers Conservation Technical Series No.5 English Nature, Peterborough.

Macdonald, D.W., Mace, G. & Rushton, S. 1998. Proposals for future monitoring of British mammals. Department of the Environment, Transport and the Regions, and Joint Nature Conservation Committee, London.

Mitchell-Jones, A.J. (Ed).2004. Bat Mitigation Guidelines. English Nature:
<http://naturalengland.etraderstores.com/NaturalEnglandShop/IN136>

Mitchell-Jones, A.J. & McLeish, A.P. (Ed). 2004. Bat Workers' Manual. JNCC.

Mitchell-Jones, A.J. & Schofield, H.W.2003.The Bats of Britain & Ireland. The Vincent Wildlife Trust.

National Rivers Authority 1993. Otters and river habitat management. Conservation Technical Handbook 3 (subsequently reissued by the Environment Agency)

Natural England Technical Information Note TIN059. 2009. Bats and Single large wind turbines: <http://nepubprod.appspot.com/publication/33013?category=9001>

Natural England Technical Information Note TIN051. 2009. Bats and onshore wind turbines: Interim Guidance:

<http://naturalengland.etraderstores.com/NaturalEnglandShop/TIN051>

Richardson, P. 2007. Distribution Atlas of Bats In Britain and Ireland: 1989 - 1999. BCT.

Rose, F. 2006. The Wild Flower Key. Frederick Warne.

Rose, F. 1989. Grasses, Rushes and Ferns of the British Isles and north – west Europe. Viking.

Russ, J. 1999. The Bats of Britain & Ireland: Echolocation Calls, Sound Analysis and Species Identification. Alana Ecology.

Sargent, G & Morris, P. 2003. How to Find and Identify Mammals. 2nd Edition. The Mammal Society

Scottish Natural Heritage 1998. Red Squirrels. Naturally Scottish Series. SNH.

Scottish Natural Heritage. 2002. Badgers and Development. Scottish Wildlife Series. SNH:
<http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=65>

Scottish Natural Heritage 2008. Otters and Development. Scottish Wildlife Series. SNH:
<http://www.snh.org.uk/publications/on-line/wildlife/otters/default.asp>

Scottish Natural Heritage Commissioned Report No. 211 (ROAME No. F03AC309):
http://www.snh.org.uk/pdfs/publications/commissioned_reports/Report%20No211.pdf

Strachan, R. 2006. The Water Vole Conservation Handbook. EA/EN/WildCRU, Oxford.
Water vole Conservation handbook (2nd edition)

Strachan, R. 2007. National survey of otter *Lutra lutra* distribution in Scotland 2003–04.

Websites

MAGIC database. DEFRA. <http://www.magic.gov.uk/website/magic/>

National Biodiversity Network Gateway. <http://data.nbn.org.uk/>

UK-Wide Biodiversity Action Plan. <http://jncc.defra.gov.uk/default.aspx?page=5155>

Argyll & Bute Local Biodiversity Action Plan. <http://www.argyll-bute.gov.uk/sites/default/files/planning-and-environment/AandB%20BAP%20Draft.pdf>

The Scottish Biodiversity List. <http://www.snh.gov.uk/protecting-scotlands-nature/biodiversity-scotland/scottish-biodiversity-list/>

References for Chapter 6

Eaton MA, Brown AF *et. al.* 2009. Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. *British Birds* 102, pp296–341.

Gilbert, G., Gibbons, D.W. & Evans, J. 1998. *Bird Monitoring Methods*. RSPB, Sandy.

Hötter, H., Thomsen, K.-M. & H. Jeromin. 2006. Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats - facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation. Michael-Otto-Institut im NABU, Bergenhusen.

Mitchell, C. 2011. Status and distribution of Icelandic-breeding geese: results of the 2010 international census. Wildfowl & Wetlands Trust Report, Slimbridge.

Pearce-Higgins, J.W., Stephen, L., Langston, R.W., Bainbridge, I.P. and Bullman, R. 2009. The distribution of breeding birds around upland wind farms. *Journal of Applied ecology*, 46: 1323-1331.

SNH. 2005 revised in 2010. *Survey Methods for Use In Assessing The Impacts Of Onshore Windfarms On Bird Communities*

Stewart, G.B., Pullin, A.S. & Coles, C.F. 2004. Effects of wind turbines on bird abundance. Systematic Review no. 4. Centre for Evidence-Based Conservation, Birmingham, U.K.

References for Chapter 7

Argyll and Bute Council, Finalised Core Paths Plan, 2011.

Argyll and Bute Council, Argyll and Bute Structure Plan

Argyll and Bute Council, Argyll and Bute Local Plan

Landscape Institute and IEMA, 2002. Guidelines for Landscape and Visual Impact Assessment, Second Edition

Landscape Institute. 2011. Photography and photomontage in landscape and visual impact assessment, Advice Note 01/11

Scott K.E., Anderson C., and Benson J. F. 2005. An assessment of the sensitivity and capacity of the Scottish Seascape in relation to offshore windfarms, SHN Commissioned Report No.103,

Scottish Natural Heritage. 2001. Guidelines on Environmental Impacts of Windfarms and Small Scale Hydro Electric Schemes.

Scottish Natural Heritage. 2006. The Scottish Renewables Forum and the Scottish Society of Directors of Planning, Visual Representation of Wind farms: Good Practice Guidance.

Scottish Natural Heritage. Version 1, 2009. Siting and Design Windfarms in the Landscape.

Scottish Natural Heritage. 2009. Strategic Guidance for Onshore Wind Farms.

Scottish Natural Heritage. 2010. The special qualities of the National Scenic Areas. SNH Commissioned Report No.374.

Scottish Natural Heritage Advisory Services. Version 2, 2005. Guidance for the Assessment of Cumulative Landscape and Visual Impacts Arising from Wind farm Developments – and the emerging 3rd version which is currently out to consultation.

University of Newcastle and Scottish Natural Heritage, Visual Assessment of Wind Farms: Best Practice 2002.

University of Sheffield and Landuse Consultants. 2002. Landscape Character Assessment: Guidance for England and Scotland, Countryside Agency and Scottish Natural Heritage publication.

OS Explorer Maps 377, 360, 376,

Websites

<http://maps.google.com>

<http://www.bing.com/maps/>

<http://www.walkhighlands.co.uk/>

<http://www.munromagic.com/>

<http://www.argyll-bute.gov.uk>

<http://www.snh.gov.uk/>

<http://www.visitscottishheartlands.com/>

<http://fishing-argyll.co.uk/>

References for Chapter 8

Geddes, J and Hale, A. 2010. The Archaeological Landscape of Bute. RCAHMS and Discover Bute Landscape Partnership

Hewison, J. K. 1893-5. The Isle of Bute in the Olden Time

Historic Scotland. 2010. Managing Change in the Historic Environment: Setting

Historic Scotland. 2007. Scoping of Wind Farm Proposals. Assessment of Impact on the Setting of the Historic Environment Resource. Some general considerations.

Institute of Geological Sciences Geological Survey of Great Britain (Scotland) Sheet 29
Rothesay

Mac An Tàilleir, I. 2003 Gaelic Place Names. Parlamaid na h-Alba

The Statistical Account of Scotland 1791-9, Volume 1

The New Statistical Account of Scotland 1845, Volume 5

References for Chapter 11

ETSU. 1997. ETSU-R-97: The assessment and rating of noise from wind farms, the
Department of Trade and Industry

PAN 45. 2002. Planning Advice Note 45 (Revised 2002): Renewable Energy Technologies,
Scottish Executive

NPL Acoustics: Calculation of absorption of sound by the atmosphere. National Physical
Laboratory.

References for Chapter 13

Ipsos Mori <http://www.ipsos-mori.com/researchpublications/researcharchive/2946/RenewableUK-Wind-Power-Omnibus-research.aspx>

Visit Scotland
http://www.visitscotland.org/research_and_statistics/tourism_topics/wind_farms.aspx

Scottish Government
<http://www.scotland.gov.uk/News/Releases/2012/04/windtourism24042012>

Towards Zero Carbon Bute <http://www.tzcb.org.uk/?paged=3>.

Scotland's Census Results Online <http://www.scrol.gov.uk/scrol/common/home.jsp>

Scottish Neighbourhood Statistics <http://www.sns.gov.uk/>